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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 on the move"

49th Annual Scientific Meeting

24-25 March 2017

Sheraton Hua Hin, Petchaburi, Thailand

Program & Abstracts

Accredited for CME 14.5, CNEU 15, CPE 14.25 Credit hours

ปีที่ 30 ฉบับที่ 1
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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 2559- มีนาคม 2561)

นายกสมาคม	ถาวร สุทธิไชยากุล
President	Taworn Suithichaiyakul
อุปนายก	ครรชิต ลิขิตธนสมบัติ
Vice President	Kanchit Likitthanasombat
เลขาธิการ	ระพีพล กุญชร ณ อยุธยา
Secretary-General	Rapeephon Kunjara-Na-Ayudhya
เหรัญญิก	คุณหญิงมัลลิกา วรรณไกรโรจน์
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Scientific Chairman	Rungroj Krittayaphong
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Council Members	Nithima Ratanasit
	นครินทร์ ศันสนยุทธ
	Nakarin Sansanayudh
	เกษม รัตนสุมาวงศ์
	Kasem Ratanasumawong
	ดิลก ภิยโยทัย
	Dilok Piyayotai
	ธัชพงศ์ งามอุโฆษ
	Tachapong Ngarmukos
	วราภรณ์ ติยานนท์
	Waraporn Tiyanon

Message from President

Dear Colleagues,

It is an honor and a privilege for me to welcome you to the 49th Annual Scientific Meeting of the Heart Association of Thailand under the Royal Patronage of H.M. the King scheduled to take place from 24-25 March 2017 at Sheraton Hua Hin, Thailand.

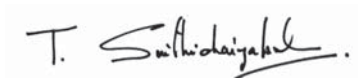
As the Heart Association of Thailand approaches its 50th years of existence, we are proud to say that we have long been committed to our mission which is to encourage members to be fully engaged in professional development and in strengthening of cardiology community interaction. The organization of several educational meetings throughout the year and the seminars on the latest methods and technologies related to cardiovascular science for the physicians and the medical professional involved at the remote hospitals in many provinces are the manifestation of our strong commitment.

The theme "Cardiology on the move" aims to serve as an exciting forum for the participants, who are not only the physicians but all levels of healthcare personnel, to learn from and to exchange experience with the local and internationally renowned experts on today's management of several complex cardiovascular diseases.

On behalf of the Heart Association of Thailand under the Royal Patronage of H.M. the King, I would like to express my deep gratitude for everyone participating in the meeting. Our sincerest appreciation also go to the guest speakers, moderators, the pharmaceutical companies, members of the Organizing Committee and all supporting staff for making this meeting a great success.

I look forward to seeing you in March 2017 for a fruitful and educational meeting.

Warmest regards,



Taworn Suithichaiyakul, MD, FACC
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 all of you to the 49th Annual Scientific Meeting of the Heart Association of Thailand under the Royal Patronage of H.M. the King during 24-25 March 2017, at Sheraton Hua Hin, Thailand.

As stated in the mission of the Heart Association of Thailand under the Royal Patronage of H.M. the King, we are committed to address issues in cardiovascular disease and to provide the latest educational knowledge to those involved.

Themed "Cardiology on the move" of this year reflects the exciting dimensions of the scientific program. We hope it will attract the interest of not only cardiologists but also healthcare personnel engaged in the management of patients with complex cardiovascular diseases.

This year, we are privileged to present the Kasarn Jatikavanit Memorial Lecture on "Imaging in Heart Failure" and the Kamol Sindhvanandha Honorary Lecture on "Update heart failure guideline 2017", these two lectures are designed to honor the outstanding life and achievements of the two Thai cardiologists.

Your interaction with your peers will help stimulate a fruitful exchange of ideas and will be personally rewarding. We hope this meeting will prove to be an inspiring and useful for all of you.

We sincerely look forward to welcoming you in March 2017.

Yours sincerely,

Rapeephon Kunjara Na Ayudhya, MD, FACC
Secretary General
The Heart Association of Thailand under the Royal Patronage of H.M. the King

Message from Scientific Chairman

Dear Colleagues,

On behalf of the Organizing Committee, it is a privilege to welcome you all to the 49th Annual Scientific Meeting of the Heart Association of Thailand under the Royal Patronage of H.M. the King scheduled to be convened on 24-25 March 2017 at Sheraton Hua Hin, Thailand.

This year our theme for scientific program is "Cardiology on the move". It will provide a forum for participants to update themselves on the latest methods and technologies, enabling them to prepare themselves for the changes and challenges of the future. This year, we are honored to present a highlighted session of the ACC and ESC and a round table case discussion by the renowned speakers from the ACC, the ESC and the Heart Association of Thailand on Aortic stenosis and Ischemic cardiomyopathy to your attention.

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. We certainly hope this will help strengthen further collaboration among those involved in cardiovascular medicine.

Yours sincerely,

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

Invited International Faculty list

Bogdan A. Popescu, MD, PhD, FESC, FACC, FASE
President, European Association of Cardiovascular Imaging
Vicepresident, Romanian Society of Cardiology University of Medicine and Pharmacy 'Carol Davila'
Institute of Cardiovascular Diseases 'Prof. Dr. C. C. Iliescu', Bucharest, Romania

Borja Ibanez, MD, PhD, FESC
Department of Cardiology, Hospital Fundación Jiménez Díaz, Madrid, Spain
Fundación Centro Nacional de Investigaciones Cardiovasculares. Carlos III (CNIC), Madrid, Spain

Lee Goldberg, MD, MPH
Associate Professor of Medicine, at the Hospital of the University of Pennsylvania, Philadelphia, USA
Vice Chair of Medicine – Informatics. Medical Director, Heart Failure and Cardiac Transplant Program

Smadar Kort, MD
Clinical Professor of Medicine, Stony Brook University Medical Center, NY, USA

Invited Thai Faculty list

Adisai Buakhamsri, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Thammasat University, (Rangsit Campus), Pathumtani, Thailand

Apichai Khongphatthanayothin, MD
Bangkok Heart Institute (Pediatrics), Bangkok General Hospital, Bangkok, Thailand

Burabha Pussadhamma, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine,Khon Kaen University, Khon Kaen, Thailand

Chanika Sritara, MD, MSc.
Division of Nuclear Medicine, Department of Diagnostic and Therapeutic Radiology, Ramathibodi Hospital, Mahidol University, Bangkok Thailand

Charn Sriratanasathavorn, MD
Her Majesty Cardiac Center, Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Dilok Piyayotai, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Thammasat University, (Rangsit Campus), Pathumtani, Thailand

Eakarnantha Arnanthanitha, MD
Department of medicine,Pattani Hospital, Pattani, Thailand

Kamol Udol, MD, MSc
Division of Cardiovascular-Metabolic Disease Prevention, Department of Preventive and Social Medicine, and Her Majesty Cardiac Center, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

Kanchit Likitthanasombat, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Kriangkrai Tantiwongkosri, MD
Division of Cardiovascular and Thoracic, Department of Surgery, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Kriengkrai Hengrussamee, MD
Cardiology Division, Central Chest Institute of Thailand, Nonthaburi, Thailand

Krisada Sastrava, MD
Air force medical operations center, Medical department of the air force, Bangkok, Thailand

Marut Chantra, MD
Department of Pediatrics (Cardiology), Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Nakarin Sansanayudh, MD
Cardiovascular Division, Department of Medicine, Pramongkutklao Hospital, Bangkok, Thailand

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

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

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Cardiology Unit, Department of Medicine, Faculty of Medicine,Khon Kaen University, Khon Kaen, Thailand

Piya Samankatiwat, MD
Cardiac Surgeon Unit, Department of Surgery, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

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Division of Cardiovascular and Thoracic, Department of Surgery, Siriraj Hospital, Mahidol University, Bangkok, Thailand

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

Invited Faculty Nurse list

Bubpawon Srilum, RN, MPA
Nurse in Cardiothoracic Nursing, Central Chest Institute of Thailand, Nonthaburi, Thailand

Chanaikarn Kaewutai, RN
Department of medicine ,Pattani Hospital, Pattani, Thailand

Duangkamol Wattradul, RN, DNS
The Thai Red Cross College of Nursing, The Thai Red Cross Society, Adult and geriatric nursing department, Bangkok, Thailand

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

Nawarat Suthipong, RN
Central Chest Institute of Thailand, Nonthaburi, Thailand

Penchun Saenprasarn, RN, EdM
Chancelloe of Shinawatra University, Prathumthani, Thailand

Invited Faculty Pharmacist list

Ajjima Sarapakdi, MS
Pharmaceutical Care Unit, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Chuthamanee Suthisisang, BSc, PhD
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Clinical Pharmacy Division, Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand

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Invited Moderators

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Nurse in Cardiothoracic Nursing, Central Chest Institute of Thailand, Nonthaburi, Thailand

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Perfect Heart Institute, Piyavate Hospital, Bangkok, Thailand

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Cardiovascular Division, Department of Medicine, Pramongkutklao Hospital, Bangkok, Thailand

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Heart Center, Vichaiyut Hospital, Bangkok, Thailand

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Waraporn Tiyanon, MD
Cardiovascular Division, Department of Medicine, Pramongkutklao Hospital, Bangkok, Thailand

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

Invited Case presenter list

Aekarach Ariyachaipanich, MD
Division of Cardiology, Department of Medicine, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

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

Invited Panelists

Bogdan A. Popescu, FESC, FACC
President, European Association of Cardiovascular Imaging, Vicepresident, Romanian Society of Cardiology
University of Medicine and Pharmacy 'Carol Davila', Institute of Cardiovascular Diseases 'Prof. Dr. C. C. Iliescu' Bucharest, Romania

Borja Ibanez, MD, PhD, FESC
Department of Cardiology, Hospital Fundación Jiménez Díaz, Madrid, Spain
Fundación Centro Nacional de Investigaciones Cardiovasculares. Carlos III (CNIC), Melchor Fernández Almagro, Madrid, Spain

Decho Jakrapanichakul, MD
Division of Cardiology, Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Lee Goldberg, MD, MPH
Medical Director, University of Pennsylvania Heart Failure and Transplantation program
Associate Professor of Med icine at the Hospital of the University of Pennsylvania, Philadelphia, PA, USA

Smadar Kort, MD
Clinical Professor of Medicine, Stony Brook University Medical Center, Brook, NY, USA

Wacin Buddhari, MD
Division of Cardiology, Department of Medicine, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Invited Commentators

Adisai Buakhamsri, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Thammasat University, (Rangsit Campus), Pathumtani, Thailand

Charn Srirattanasatavorn, MD
Her Majesty Cardiac Center, Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Songsak Kiertchoosakul, MD
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Surapun Sitthisook, MD, FAsCC
Division of Cardiology, Department of Medicine, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Invited Judges

Young Investigator Award

Isham Jaafar, MD, FAsCC
President; Brunei Cardiac Society

Hav Ratneary, MD,
Vice President; Cambodian Heart Association

Ario Soeryo Kuncoro, MD, FAsCC
Vice Secretary General; Indonesian Heart Association

Vang Chu, MD, FAsCC
President; Lao Cardiac Society

Wan Azman Wan Ahmad, MD, FAsCC
Vice President; National Heart Association of Malaysia

Khin Maung Lwin, MD, FAsCC
President; Myanmar Cardiac Society

Raul Lapitan, MD, FAsCC
President; Philippine Heart Assocaition

Ong Hean Yee, MD, FAsCC
Vice-President; Singapore Cardiac Society

Taworn Suithichaiyakul, MD, FAsCC
President; The Heart Association of Thailand under The Royal Patronage of H.M. the King

Gia Khai, MD, FAsCC
Honorary President: of Vietnam National Heat Association

Invited Judges

Research by Fellow in Cardiology

Aekarach Ariyachaipanich, MD
Division of Cardiology, Department of Medicine, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

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Kriengkrai Hengrussamee, MD
Cardiology division, Central Chest Institute of Thailand, Nonthaburi, Thailand

Krisada Sastrava, MD
Air force medical operations center, Medical department of the air force, Bangkok, Thailand

Nakarin Sansanayudh, MD
Cardiovascular Division, Department of Medicine, Pramongkutklao Hospital, Bangkok, Thailand

Nithima Ratanasit, MD
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Rapeephon Kunjara-Na-Ayudhya, MD
Heart Center, Vichaiyut Hospital, Bangkok, Thailand

Rungroj Krittayaphong, MD
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Rungsrit Kanjanavanich, MD
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Smonporn Boonyarattavej Songmuang, MD
Division of Cardiology, Department of Medicine, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

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

Taworn Suithichaiyakul, MD
Division of Cardiology, Department of Medicine, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Teerapat Yingchoncharoen, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Vichai Senthong, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine,Khon Kaen University, Khon Kaen, 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 Hear 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.

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

Title and/or degrees:
Professor of Pediatrics /MD, MPPM

Education:

1983	High School, Triam Udom Suksa School, Bangkok, Thailand
1989	Medical School, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand, First Class Honor
July 1990-June 1991	Internship, LAC/USC Medical Center (Pediatrics), University of Southern California, Los Angeles, CA, USA
July 1991-June 1993	Residency, LAC/USC Medical Center (Pediatrics), University pf Southern California, Los Angeles, CA, USA
July 1993-June 1994	Chief Residency, LAC/USC Medical Center (Pediatrics), University pf Southern California, Los Angeles, CA, USA
July 1994-June 1997	Fellowship, Children's Hospital Los Angeles (Pediatric Cardiology), Los Angeles, CA, USA
June 1997-May 1998	University of Southern California (Research Fellow in Clinical Cardiac Electrophysiology), Los Angeles, CA, USA
September 2013-November 2014	Department of Cardiology, Academic Medical Center, University of Amsterdam, Netherland (Fellow in Cardiogenetics), Amsterdam, Netherland,
2006	Honors and Awards, Young Investigator Award, The Heart Association of Thailand, The 38th Annual Meeting of the Heart Association of Thailand, Pattaya,

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

Board Certification:

1994	American Board of Pediatrics
1998	American Board of Pediatric Cardiology

Master Degree:

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

Professional Background:
Academic Appointments

2009-Present	Professor of Pediatrics, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand
2012-Present	Professor of Clinical Pediatrics, Keck School of Medicine of USC

Bogdan Alexandru Popescu, FESC, FACC
President, European Association of Cardiovascular Imaging
Vicepresident, Romanian Society of Cardiology University of Medicine and Pharmacy
'Carol Davil' Institute of Cardiovascular Diseases 'Prof. Dr. C. C. Iliescu',
Bucharest, Romania

Title and/or degrees:
Professor of Cardiology /MD, FESC, FACC

Work Experience:

2016–Present	Professor of Cardiology University of Medicine and Pharmacy, Bucharest (Romania)
2014–Present	PhD supervisor in the field of Medicine Habilitation title issued by the Ministry of Education after successfully defending the Habilitation thesis, Bucharest (Romania)
2000–Present	Senior cardiologist a particular interest in imaging, teaching and research.
2008–Present	Director of Euroecolab The echocardiography laboratory at the Institute of Cardiovascular Diseases, Bucharest (Romania) The lab was awarded European accreditation in standard transthoracic and stress echocardiography and advanced transoesophageal echocardiography by the EAE.
2016–2018	President of the European Association of Cardiovascular Imaging 2014–2017 Vicepresident of the Romanian Society of Cardiology 2008–2012 Member of the Committee for Practice Guidelines of the European Society of Cardiology

Education and Training:

1988–1994	MD Faculty of General Medicine, "Carol Davila" University of Medicine and Pharmacy, Bucharest (Romania)
1995–1999	Resident in Cardiology "Prof. Dr. C.C. Iliescu" Institute of Cardiovascular Diseases, Bucharest (Romania)

Additional Information:

Publications	More than 130 articles indexed on PubMed More than 90 full-text original articles in journals with impact factor. Hirsch Index by ISI: 20. Citations: over 4500 ISI citations (>9200 Google Scholar; h-index Google Scholar: 30). Author of 3 books on echocardiography. Co-Editor of the EACVI Textbook on Echocardiography.
Recognition	Member of the International Scientific Board of: European Heart Journal-Cardiovascular Imaging, Cardiovascular Ultrasound. Associate Editor of Echo Research and Practice (journal of the British Society of Echocardiography). Deputy-Editor of the Romanian Journal of Cardiology (journal of the Romanian Society of Cardiology) Member of the peer-review committee for: J Am Coll Cardiol, Eur Heart J, Heart, Am J Cardiol, Eur J Heart Fail, JACC-Imaging, Circulation-Imaging, Eur J Echocardiogr, Eur Journal Cardiovasc Prev, Cardiovascular Ultrasound, etc Invited lecturer at international congresses: more than 100 invited international lectures (Europe, USA, Japan, Korea, India, China, Mexico)

Borja Ibanez, MD, PhD, FESC
Department of Cardiology,
Hospital Fundación Jiménez Díaz,
Fundación Centro Nacional de Investigaciones Cardiovasculares.
Carlos III (CNIC), Madrid, Spain
Title and/or degrees:
Professor/ MD, PhD, FESC

Borja Ibáñez (Madrid, 1975), MD PhD is a Cardiologist with a main interest in acute myocardial infarction. He combines research activities as Director of the Clinical research Department of the National Center for Cardiovascular Research (CNIC) in Spain with clinical activities as interventional cardiologist at the University Hospital Fundación Jiménez Díaz.

After completing his training as full cardiologist in Spain, he was trained in cardiovascular research at Mount Sinai School of Medicine, new York USA. Dr. Ibanez Borja has been dedicating his entire career to acute myocardial infarction and post-infarction heart failure, both at research and clinical levels. His research is highly translational with a clear clinical impact focused on performing clinical trials arising from preclinical data generated by his laboratory group. Borja is an expert on the role of the beta-adrenergic system modulation in cardiovascular diseases and in the use of imaging for myocardial tissue characterization. He has been the leader of the research program repurposing metoprolol use as a drug able to reduce long-term post-infarction heart failure and he is also active in the search of other targets that could be brought to the clinical arena in the future. He is/has been principal investigator of several multicenter clinical trials recruiting patients with STEMI.

He is the Chairman of the 2017 ESC STEMI Clinical Practice Guidelines.

He is PI of several national and international projects, including H2020-funded grants. He has published more than 130 scientific publications in high-impact journals in the cardiovascular field, most of them as main author (Science, New Engl J Med, Lancet, Nature Medicine, Circulation, J Am Coll Cardiol, Eur Heart J, Circ Res) as well as 15 book chapters, more than 50 invited conferences, more than 200 meeting contributions and over 10 scientific awards, highlighting “Principe de Girona Award in science” for his “contribution in the field of cardiology translational research”.

He serves as Associate Editor in the Journal of the American College of Cardiology (the leading journal of cardiovascular diseases area), Guest Editor JACC- Basic to Translational Science, and he is in the editorial board of Basic Research in Cardiology and Journal of Cardiovascular Translational Research journals.

Bubpawon Srilum, RN, MPA
Nurse in Cardiothoracic Nursing
Central Chest Institute of Thailand
Nonthaburi, Thailand

Title and/or degrees:
RN, MPA

Education:

1984	Bachelor of science (Nursing), Faculty of Nursing, Nakhon Ratchasima University
1991	Cirtificate Incardiothoracic and Healthboard Vascular Nursing Auckland Area Newzealand
2002	Master of Public Administration National Institute of Development Administration

Employment History:

Work History	ICU, at Central Chest Institute of Thailand 1994-2010
Academic Position	Expert Nurse in Cardiothoracic Nursing

Burabha Pussadhamma, MD
Division of Cardiology, Department of Medicine,
Faculty of Medicine, Khon Kaen University,
Khon Kaen, Thailand

Title and/or degrees:
MD

Education and training:

2004 M.D. (first class honors), faculty of medicine, Khon Kaen University, Khon Kaen, Thailand
2008 Resident in internal medicine, Khon Kaen University, Khon Kaen, Thailand
2011 Fellow in cardiology, Khon Kaen University, Khon Kaen, Thailand
2013 Fellow in interventional cardiology, Khon Kaen University, Khon Kaen, Thailand
2013 Master on Pulmonary Vascular Disease, S.Orsola-Malpighi hospital, University of Bologna, Italy
2013 Train Medical Trainer of PCI Institute (TMT) 2013 winter program, Saiseikai Yokohama-city Eastern Hospital, Japan
2015 International Short Course Training in Research Methodology & Biostatistics, Khon Kaen University, Khon Kaen, Thailand

Employment:

2008- current Srinagarind hospital, Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand
2011-current Queen Sirikit Heart Center of the Northeast, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Area of interests:

- Pulmonary vascular disease
- Rheumatic heart disease
- Heart failure
- Acute coronary syndrome

Chaicharn Deerochanawong, MD
Diabetes and Endocrinology unit,
Department of Medicine,
Rajavithi Hospital Bangkok, Thailand

Title and/or degrees:
Professor; MD

Education: 1985 MD. Chulalongkorn University, Thailand

Postdoctoral Training:

1985-8	Resident, Internal Medicine, Khonkhaen University
1990-2	Clinical and research fellow in Diabetes and Endocrinology, University of Newcastle Upon Tyne, United Kingdom.

Licensure and Certification:

1985	Thai Medical License Registration
1989	Thai Board of Internal Medicine, Certificate
1992	Certificate fellowship in Diabetes and Endocrinology

Hospital Appointment:
1989-present Diabetes and Endocrinology unit, Rajavithi Hospital, Bangkok, Thailand.

Position:

1992-present	Consultant Physician, Diabetes and Endocrinology unit, Rajavithi hospital, Bangkok, Thailand.
2005-present	Assistant Director, Undergraduate institution of medical education of Rangsit University

Major Committee Assignment:

Present	Scientific Chairman Committee of Endocrine Society of Thailand
Present	Secretary and Committee of Thai Society of Obesity
Present	Committee of Royal College of Physician of Thailand
Present	Committee of Thai Diabetes Association Society
Present	Committee of Thai Diabetes Educator Society

Awards:

	British Council Scholarship
1996	Endocrine Society of Thailand Distinguished Research Award

Chanika Sritara, MD, MSc.
Division of Nuclear Medicine,
Department of Diagnostic and Therapeutic Radiology,
Ramathibodi Hospital, Mahidol
University, Bangkok Thailand

Title and/or degrees:
Associate Professor, MD, MSc.

Academic:

1992	Staff Nuclear Medicine, Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University
1997	Assistant Professor of Radiology, Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University
2013	Associate Professor of Radiology, Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University

Administrative:

2008-2009	Assistant Head of Department of Diagnostic and Therapeutic Radiology , Research and Academic Affairs, Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University
2009-2011	Deputy Head of Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University
2011-Present	Head of Nuclear Medicine Division, Department of Diagnostic and Therapeutic Radiology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University

Education:

High School:

Year attended	Field of study & Diploma/degree	Name and place of institution
1981-1982	AFS Exchange Programme Grade12	Winters High School

University:

1989	Medicine, M.D. (First Class Honour)	Faculty of Medicine, Ramathibodi Hospital. Mahidol University
1991	Master of Science in Nuclear Medicine	Guy's Hospital, London University, England.
1995	Thai Board of Nuclear Radiology	Medical Council of Thailand
2001	Master of Science in Clinical Epidemiology	Faculty of Medicine, Chulalongkorn University

Professional Training:

1997	Regional (RCA) training on infection and inflammation imaging, Singapore
2000	Application of Positron Emission Tomography, China
2004	PET-SPECT Imaging at Singapore General Hospital, Singapore
2004	PET-SPECT Imaging at Royal Perth Hospital, Australia
2005	PET-CT at Royal Prince Alfred Hospital (RPAH) Sydney, Australia
2007	IAEA Training Course on Establishing a Cyclotron Facility and Positron Emission Tomography at Technical University Munich; Nuclear Medicine Clinic and Policlinic, München, Germany
2008	Certified Clinical Densitometrist (CCD) of the International Society for Clinical Densitometry (ISCD)
2010	IAEA Regional Training Course on Imaging in Ischemic Heart Disease and Cardiac Failure for Advanced Users at Tehran, Islamic Republic of Iran
2011	IAEA Regional Training Course on Use of nuclear cardiology in myocardial viability assessment and introduction to PET and PET/CT for advanced uses, Manila Philippines

2011	Certification in Logistic Regression of Section for Clinical Epidemiology and Biostatistics Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok Thailand
2011	IAEA Final Project Coordination Meeting for the RAS 6057 Strengthening and Standardizing Nuclear Medicine Applications in Cardiology in Asia through Education and Training, Ho Chi Minh City, Vietnam
2012	ISCD Body Composition Course, Los Angeles, USA
	ISCD Vertebral Fracture Assessment Course, Los Angeles, USA

Charn Sriratanasathavorn, MD
Her Majesty Cardiac Center, Department of Medicine,
Siriraj Hospital, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
Associate Professor, MD

Education and training:

1981-87	Mahidol University (Siriraj Hospital), Bangkok, Thailand
1990-91	Internship, Internal Medicine, Detroit Medical Center, Wayne State University, Detroit, Michigan
1991-93	Residency, Internal Medicine, Detroit Medical Center, Wayne State University, Detroit, Michigan
1993-96	Fellowship, Cardiology, Emory University School of Medicine, Atlanta, Georgia
1996-97	Fellowship, Cardiac Electrophysiology, Emory University School of Medicine, Atlanta, Georgia

Current position: Associate professor, Her Majesty's Cardiac Centre, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Medical affiliation:
- Member of The Heart Association of Thailand
- 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 Medicine

Honors 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

Chuthamanee Suthisisang, BSc, PhD
Department of Pharmacology
Faculty of Pharmacy, Mahidol University
Bangkok,Thailand

Title and/or degrees:
Associate Professor, BSc, PhD

Current Appointment: Staff, Department of Pharmacology, Faculty of Pharmacy, Mahidol University

Educations:
1980 Bachelor of Science in Pharmacy, Mahidol University
1984 Master of Science in Pharmacy, Mahidol University
1988 Doctor of Philosophy (Pharmacology), Mahidol University

Post Graduate Training:
- Visiting Scientist at Neuropsychopharmaology Unit, Mario Negri Institute for Pharmacological Science, Milan, Italy
- Certificate in Drug Efficacy Evaluation (WHO)
- Certificate in Clinical Pharmacy Education (USC, USA)

Present Professional Service:
- Committee, Pharmacy Council
- Director, Center for Continuing Pharmaceutical Education (CCPE)
- Scientific chairman, Thai Association for the Study of Pain (TASP)
- Dean, Faculty of Pharmacy, Mahidol University

Dilok Piyayotai, MD
Division of Cardiology, Department of Medicine,
Faculty of Medicine, Thammasat University Klong Luang,
Pathumthani, Thailand

Title and/or degrees:
Associate Professor/ MD

Topic of Interest: Interventional Cardiology, General Cardiology

Degrees and Certificates:

1991 Doctor of Medicine, Chulalongkorn University
1995 Certificate in Clinical Science, Internal Medicine
1997 Thai Board of Internal Medicine
1999 Thai Board of Cardiovascular Medicine
1999 Master Degree of Science, Chulalongkorn University
2003 Certificate in Interventional Cardiology, Concord General Hospital and Royal Prince Alfred Hospital, University of Sydney

Position in Admistration:

2014-Now Deputy Director in Human Resource Affairs, Thammasat University Hospital, Thammasat University
2008-2014 Deputy Director in Health Service and academic Affairs, Thammasat University Hospital, Thammasat University
2006-Now Director of Cardiac Catheterization Laboratory, Thammasat Heart Center, Head of Department of medicine, Faculty of Medicine, Thammasat University

Duangkamol Wattradul, RN, DNS
The Thai Red Cross College of Nursing,
The Thai Red Cross Society,
Adult and geriatric nursing department,
Bangkok, Thailand
Title and/or degrees:
Assistant Professor, RN, DNS

Professional education:
Start with most recent and work backwards

1998-2002	DNS, Nursing, Mahidol University, Thailand
1993-1995	MNS, Adult Nursing, Mahidol University, Thailand
1986-1887	Diploma of Advanced Special Nursing Course (ICU-CCU), Advanced special course of ICU-CCU Nursing, Nihon University, Japan
1978-1981	BNS, Nursing, The Thai Red College of Nursing, Thailand

Eakarnantha Arnanththanitha, MD
Department of medicine,
Pattani Hospital,
Pattani, Thailand

Title and/or degrees:
MD

MD, Prince of songkhla University.
Internal medicine, Siriraj Hospital,Mahidol University
Fellowship clinical cardiology, Siriraj Hospital,Mahidol University

Jenjira Tantiviyavanit, MSc
Pattani Provincial Health Office
Pattani Hospital, Pattani, Thailand

Title and/or degrees:
M.Sccist, Professional Level

Pharmacy license No. 20185
Profile

Education:

2001-2005	Bachelor of Pharmacy, Prince of Songkla University
2009	Master of Business Administration Sukhothai Thammathirat Open University
2015	Master of Science in Pharmacy (M.Sc. in Pharm.) (Chinical Pharmacy), Prince of Songkla University

Experience:

- Pharmacist, Kasemrad Hospital, Bangkok (2006-2007)
- Pharmacist, Professional Level, Pattani Hospital, Maung District, Pattani (February 2007 – now)
- Quality Support Team Committee, Pattani Hospital
- Internal Survey Committee, Pattani Hospital
- Provincial Heart Network Committee, Pattani Hospital
- Service achievement Plan Committee, Pattani Hospital
- Quality Learning Network Committee, Pattani province
- Pharmaceutical and Therapeutic Committee (Committee and Assistant Secretary), Pattani Hospital
- Medication Management System Committee and Assistant Secretary, Pattani Hospital
- Knowledge Management of Medication Management System Committee and Assistant Secretary, Pattani Hospital (2014 – now)
- Risk Management Committee and Assistant Secretary, Pattani Hospital

Junporn Kongwatcharapong, PharmD, BCP
Pharmaceutical care unit,
Siriraj Hospital, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
Pharm.D, BCP

Education/Training:
2001-2006 Pharm.D (Pharm. Care), Clinical Pharmacy, Naresuan University, Bangkok, Thailand
2011-2015 BCP Cardiology, Mahidol University, Bangkok, Thailand

Positions and Honors:
List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

Dates of Employment:
Since April,1st 2007 Pharmacist of Pharmaceutical care unit, Department of Pharmacy, Siriraj Hospital, Mahidol University

Kamol Udol, MD, MSc
Division of Cardiovascular-Metabolic Disease Prevention,
Department of Preventive and Social Medicine, and Her Majesty Cardiac Center,
Faculty of Medicine, Siriraj Hospital,
Mahidol University, Bangkok, Thailand
Title and/or degrees:
Assistant Professor/ MD, MSc

Degrees and Qualifications:

2001	Master of Science (Clinical Epidemiology)
1998	Certified Thai Board of Cardiology
1994	Certified Thai Board of Internal Medicine
1988	Doctor of Medicine (First Class Honors)

Education and Training:

1999 - 2001	Clinical Health Sciences - Health Research Methodology Programme, McMaster University, Hamilton, Ontario, Canada
Mar - May 1998	Visiting Fellow, Department of Cardiology, Launceston General Hospital and Royal Hobart Hospital, Tasmania, Australia
1996 - 1998	Fellow in Cardiology, Division of Cardiology, Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand
1991 - 1994	Resident in Internal Medicine, Department of Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand
1982 - 1988	Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

Work Experiences:

2003 - Present	Assistant Professor, Division of Cardiovascular-Metabolic Disease Prevention, Department of Preventive and Social Medicine, and Her Majesty Cardiac Center, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok
1998 - 2003	Instructor, Department of Preventive and Social Medicine, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok
1994 - 1996	Internist, Department of Medicine, Lampang Regional Hospital, Lampang, Thailand
1988 - 1991	General Practitioner, Khaochaison Community Hospital, Khaochaison, Patthalung, Thailand

Memberships:
The Medical Association of Thailand
The Royal College of Physicians of Thailand
The Heart Association of Thailand Under the Royal Patronage of HM the King

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

Khanchit Likittanasombat, MD, MRCP (UK)
Cardiology Unit, Department of Internal Medicine
Ramathibodi Hospital, Mahidol University
Bangkok, Thailand

Title and/or degrees:
Associate Professor, /MD,MRCP (UK)

Education:
High School: Suankularb College, Bangkok, Thailand, Graduation 3/77
Medical School: Chiang Mai University Chiang Mai, Thailand
1977-1983 B Sc. (Medical Sciences)
1977-1983 MD (Doctor of Medicine)

Post Doctoral Training:
1983-1984 Internship: Rotating Internship, Vajira Hospital, Bangkok, Thailand
1984-1985 Residency: Internal Medicine, Vajira Hospital, Bangkok, Thailand
1986-1988 Internal Medicine, Bangour General Hospital, Edinburgh, UK
1988-1989 Fellowship: Cardiovascular Disease, Western General Hospital, Edinburgh, UK
1989-1990 Cardiovascular Disease and Electrophysiology, Freeman Hospital, Newcastle, Upon tyne, UK

Appointment:
Physician specialist & Faculty staff
Cardiology Unit, Department of Internal Medicine, Ramathibodi Hospital, Mahidol University,
Bangkok, Thailand

Kriangkrai Tantiwongkosri, MD
Division of Cardiovascular and Thoracic,
Department of Surgery, Siriraj Hospital,
Mahidol University, Bangkok, Thailand

Title and/or degrees:
MD

Professional Experience:

August 2010 – present	Cardio-Thoracic Surgery Lecturer Department of Surgery, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand.
August 2009 – August 2010	Senior Clinical Fellow, Congenital Cardiac Surgery, The Children's Hospital Boston, Harvard Medical School, Harvard, University, MA, USA
July 2008- August 2009	Clinical Fellow, Pediatric Cardiovascular Thoracic Surgery, The Children's Hospital of Philadelphia, University of Pensylvania, PA, USA
July 2007- June 2008	Clinical Fellow, Adult Cardiovascular Thoracic Surgery, Cleveland Clinic Foundation, OH, USA
February 2005- June 2007	Attending Physician, Consultant, Cardiovascular Thoracic Surgery Health Sciences Research Institute, Naresuan University, Thailand
June 2004- January 2005	Senior Fellowship, Cardiovascular Thoracic Surgery King Chulalongkorn Hospital, Chulalongkorn University, Bangkok, Thailand
June 2002- May 2004	Residency, Cardiovascular Thoracic Surgery Siriraj Hospital, Mahidol University, Bangkok, Thailand
June 1999- May 2002	Residency, General Surgery Siriraj Hospital, Mahidol University, Bangkok, Thailand
May 1997- May 1999	Internship, General Surgery Queen Sirikit Navy Hospital, Chonburi, Thailand

Education:

June1991- March 1997	Doctor of Medicine Faculty of Medicine, Mahidol University, Bangkok, Thailand

Honors and Awards:

July 2007-June 2008	Medical Instructor of Gross Anatomy, Cleveland Clinic Ohio, USA

Kriengkrai Hengrussamee, MD
Cardiology Division,
Central Chest Institute of Thailand,
Nonthaburi, Thailand

Title and/or degrees:
Civil officer, Medicine Doctor Level 10 / MD, FACC

Degree:

- MD, Diploma of the Thai Board of Internal medicine, Diploma of the Thai board of Cardiology & Interventional Cardiology, FACC
- Cardiologist and cardiac interventionist working at Central Chest institute of Thailand since 1988.
- Head of department of cardiology and intervention at CCI since 2004, working field includes general cardiology, echocardiography and interventional cardiology (PCI, PBMV, PBPV, transcatheter ASD Closure, transcatheter PDA Closure, transcatheter VSD closure, alcohol septal ablation in HCM, the first in Thai, transcatheter mitral valve repair with Mitraclip).
- The president of the Heart Association of Thailand under the Royal Patronage, HM the King from 2012 to 2014
- Winner of Thailand Public Service Award in 2013 in the service of "Fast track STEMI".
- National project manager of service plan of heart disease in Thailand (STEMI, NSTEMI, heart failure clinic, warfarin clinic and open heart surgery) in 2016.

Krisada Sastrava, MD
Air force medical operations center,
Medical department of the air force,
Bangkok, Thailand

Title and/or Degrees:
Group Captain, MD

Education:

1987 MD, second class honor Chulalongkorn University, Bangkok, Thailand

Board Certification:

1988 Certification of Flight Surgeon
1992 Institute of Aerospace Medicine, Directorate of Medical Services, RTAF Thailand
Diploma of Thai Board of Internal Medicine Bhumibol Adulyadej Hospital, Bangkok Thailand
1999 Certification of Fellowship in Internal Medicine Cardiovascular Disease,
University of Colorado Health Sciences Center, Denver CO USA
2000 Certification of Fellowship in Interventional Cardiology
University of Arizona Health Sciences Center, Tucson AZ USA
2001 Diploma of Thai Board of Cardiology
Royal College of Physician of Thailand
2008 Diploma of Thai Board of Interventional Cardiology
Royal College of Physician 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

Lakkana Suwannoi, BPharm, PharmD, BCPS, BCOP
Faculty of Pharmacy,
Mahidol University,
Bangkok, Thailand

Title and/or degrees:
Pharm.D, BCPS

Education:

August 2011-May 2014	Doctor of Pharmacy, University of Illinois at Chicago, College of Pharmacy, Chicago, IL
May 2001–March 2006	Bachelor of Pharmacy, Silpakorn University, Nakorn Pratom, Thailand

Licensures/Certificates:

2016 - present	Board Certified Oncology Pharmacist (BCOP)
2015 - present	Board Certified Pharmacotherapy Specialist (BCPS)
September 2014 - present	Pharmacist- Arizona #S020953
July 2014	Pharmacy intern – Arizona #I011635
June 2014	American Heart Association - Advanced Cardiovascular Life Support certification
April 2013	Certified immunization provider – Illinois Student Pharmacy Technician, Illinois #049209416
January 2013	American Heart Association Basic life support for health care providers certification
June 2006	Thailand licensed Pharmacist #20324

PGY-2 – Internal Medicine Residency:

July 2015	Internal Medicine I, Banner University Medical Center - Tucson Preceptors: Michael Katz PharmD, Marcella Honkonen PharmD, BCPS
August 2015	Internal Medicine II, Banner University Medical Center - Tucson Preceptors: Michael Katz PharmD, Marcella Honkonen PharmD, BCPS
September 2015	Cardiology, Banner University Medical Center - Tucson Preceptor: Rick Cosgrove PharmD
October 2015	Internal Medicine III, Banner University Medical Center - Tucson Preceptors: Michael Katz PharmD, Marcella Honkonen PharmD, BCPS
November 2015	Infectious disease, University of Arizona Medical Center Preceptor: David Nix PharmD, Katherine Matthias PharmD
December 2015	Internal Medicine IV, Banner University Medical Center - Tucson Preceptors: Michael Katz PharmD, Marcella Honkonen PharmD, BCPS
January 2016	Medical ICU, Banner University Medical Center - Tucson Preceptor: Yvonne Huckleberry PharmD, BCPS
February 2016	Academia and Research, Banner University Medical Center - Tucson Preceptor: Asad Patanwala PharmD BCPS
March 2016	Hematology/Oncology unit, Banner University Medical Center - Tucson Preceptor: Erin Ballard, PharmD, BCOP, BCNSP
April 2016	Inverstigational drugs in oncology, University of Arizona Cancer Center Preceptor: Kelly Mrydal, PharmD

May 2016- June 2016	Oncology outpatient clinic, University of Arizona Cancer Center Preceptor: Ali McBride PharmD BCPS BCOP, Jerrelee Hollings PharmD BCOP

experiences:

January 2015	Medication Use evaluation: Stress Ulcer Prophylaxis, University of Arizona Medical Center
July 2013-August 2013	Developed chemotherapy order templates for oncology ambulatory unit University of Illinois Medical Center at Chicago ▪ Docetaxel, cisplatin, and fluorouracil in head and neck cancer ▪ Cisplatin and radiation in head and neck cancer ▪ Afatinib for EGFR mutation postitive in non-small cell lung cancer

Lee R. Goldberg, MD, MPH
Penn Medicine Heart Failure and Cardiac Transplant Center
Hospital of The University of Pennsylvania
Philadelphia, PA, USA

Title and/or degrees:
Associate Professor/MD, MPH

Education:

1988	A.B. Cornell University, College of Arts and SciencesDouble Major: Biology – Physiology and Government) (cum laude)
1992	M.D. Boston University, School of Medicine (cum laude)
1998	M.P.H. Master of Public Health in Clinical Effectiveness, Harvard University, School of Public Health

Postgraduate Training and Fellowship Appointments:

1992-1993	Intern, Internal Medicine, Hospital of the University of Pennsylvania, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania
1993-1994	Junior Assistant Resident, Internal Medicine, Hospital of the University of Pennsylvania, University of Pennsylvania School of Medicine, Phila.,PA
1994-1995	Senior Assistant Resident, Internal Medicine, Hospital of the University of Pennsylvania
1995-1998	Fellowship, Cardiovascular Diseases Cardiac Unit, Massachusetts General Hospital, Harvard University School of Medicine, Boston,Massachusetts
1997-1998	Fellowship, Heart Failure and Cardiac Transplantation, Heart Failure and Cardiac Transplantation Center, Massachusetts General Hospital, Harvard University School of Medicine, Boston, Massachusetts

Faculty Appointments:

1995-1998	Research Fellow In Medicine, Harvard University School Of Medicine
1998	Instructor in Medicine, Hospital of the University of Pennsylvania
1998-2007	Assistant Professor of Medicine at the Hospital of the University of Pennsylvania, University of Pennsylvania School of Medicine
2007-present	Associate Professor of Medicine at the Hospital of the University of Pennsylvania, University of Pennsylvania School of Medicine

Hospital and/or Administrative Appointments:

1998-present	Active Medical Staff, Hospital of the University of Pennsylvania
1998-present	Active Medical Staff, Presbyterian Medical Center, UPHS
1999-2002	Medical Director, Heart Failure Disease Management Program, University of Pennsylvania Health System
2000-present	Medical Director - Heart-Lung Transplant Program, University of Pennsylvania
2006-2009	Medical Director, Heart Failure/Transplant Ambulatory Care Center, Hospital of the University of Pennsylvania
2006-2009	Associate Medical Director, Heart Failure/Transplant Program, Hospital of the University of Pennsylvania
2009-present	Medical Director, Heart Failure and Cardiac Transplant Program, University of Pennsylvania
2009-present	Active Medical Staff, Good Shepherd Penn Partners Specialty Hospital at Rittenhouse
2015-present	Vice Chair for Informatics, Department of Medicine, University of Pennsylvania

Specialty Certification:

1995	American Board of Internal Medicine - Internal Medicine Initial Certification
1998	American Board of Internal Medicine - Cardiovascular Diseases - Initial Certification
2000	United Network for Organ Sharing (UNOS) Heart Transplant Physician Certification
2005	American Board of Internal Medicine -Internal Medicine - Recertification
2008	American Board of Internal Medicine - Cardiovascular Diseases Recertification
2010	American Board of Internal Medicine - Advanced Heart Failure and Cardiac Transplant - Initial Certification
2015	American Board of Internal Medicine - Internal Medicine – Recertification

Licensure:

1994-Present	Pennsylvania License Registration
1995-Present	Massachusetts License Registration – Inactive

Awards, Honors and Membership in Honorary Societies:

1988	A.B. cum laude, Cornell University, College of Arts and Sciences
1992	Alpha Omega Alpha Medical Honor Society
1992	M.D. cum laude, Boston University School of Medicine
1992	Ishiyaku EuroAmerica Inc., Book Award
1994	The Maurice F. Attie Resident Teaching Award of the Department of Medicine, University of Pennsylvania School of Medicine
1997	American College of Cardiology/Genentech Meeting Travel Award
2002	Philadelphia Magazine 2002 Top Docs
2002	Scios, Young Investigator Finalist
2004	Disease Management Association of America - Best Journal Article
2006-2007	Medical Student Basic Science Teaching Award, Best Cardiology Lecturer
2014	Distinguished Teaching and Mentoring in Heart Failure and Cardiac Transplant - University of Pennsylvania Cardiology Fellowship Program

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

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

Nawarat Suthipong, RN
Central Chest Institute of Thailand,
Nonthaburi, Thailand

Title and/or degrees:
RN

Education:
1990 Bachelor of science (Nursing), Lampang Nursing college
1995 Certificate in Cardio-thoracic Nursing,, Mahidol University.
1999 B.Sc. (Public Health), Sukhothaithamatirat University
2007 M. Sc. (Public Health), Major in Health Education and Behavioral Sciences

Employment History:
Work History
1991-1995 ICU, at Central Chest Institute of Thailand
1995-1999 RCU at Central Chest Institute of Thailand
1999-2016 Cardiac Unit at Central Chest Institute of Thailand

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

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

Pattarapong Makarawate, MD, FHRS
Cardiology Unit, Department of Medicine,
Faculty of Medicine,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

Peerawat Jinatongthai, BSc Pharm, BCP, BCPS
Pharmacy Practice Division,
Faculty of Pharmaceutical Sciences,
Ubon Ratchathani University,
Ubon Ratchathani, Thailand
Title and/or degrees:
BSc Pharm, BCP, BCPS

Academic Background:

2014 Board Certified Pharmacotherapy (BCP)., College of Pharmacotherapy of Thailand
2014 Specialized fellowship in Cardiology pharmacotherapy, College of Pharmacotherapy of Thailand
2011 Board Certified Pharmacotherapy Specialist (BCPS), American College of Clinical Pharmacy
2011 Specialized residency in Internal medicine pharmacotherapy, College of Pharmacotherapy of Thailand
2009 General residency in pharmacotherapy, College of Pharmacotherapy of Thailand
2007 Graduated Diploma in Pharmacotherapy, Faculty of Pharmaceutical Science, Khon Kaen University, Thailand
1994 Bachelor of Science in Pharmacy, Mahidol University, Bangkok, Thailand

Professional Experience:

2014 - present Consultant/Clinical Pharmacist/PTC Committee, Pharmacy unit, Center of Medical Education and Research,
Ubon Ratchathani university
2011 - 2013 Consultant/Clinical Pharmacist, Cardiac Care Unit/Therapeutic drug monitoring service, Sunpasit Thiprasong Hospital,
Ubon Ratchathani
2013 - 2014 Registration Auditor, National Health Security Office, Region 10
2009 - 2010 Internal medicine/Cardiac Care Unit Pharmacist, Ramathibodhi Hospital, Faculty of Medicine, Mahidol University
2009 Professional training exchange in Internal medicine and Critical care, Lawrence Memorial Hospital, Lawrence, Kansas, USA
Cardiac care unit, Texas Tech University Health Sciences Center School of Pharmacy in conjunction with the Veterans Affairs North Texas Healthcare System in Dallas, Texas, USA
2006 - 2009 Clinical Pharmacist
Acute care unit: Internal medicine, Cardiology, Hematology, Infectious diseases, Intensive care, Oncology, Neurology, Nephorlogy
Ambulatory care unit: Cardiology, Adult/Pediatric hematology, Infectious diseases, Neurology, Nephorlogy)
Srinagarind Hospital, Faculty of Medicine, Khon Kaen University
2004 - 2006 Assistant Manager and Staff Pharmacist, Community Pharmacy Unit, Faculty of Pharmaceutical Sciences,
Ubon Ratchathani University

Academic Appointment:

2004 - present Instructor, Pharmacy Practice Division, Faculty of Pharmaceutical Sciences

Administrative Appointment:

2015 - present Administrative committee (Public Relations), The College of Pharmacotherapy, Thailand
2012 - present Assistant Dean (Professional Training and Development), Faculty of Pharmaceutical Sciences, Ubon Ratchathani University

Professional Affiliations:

2014 - present College of Pharmacotherapy (Thailand)
2014 - present The Association of Hospital Pharmacy (Thailand)
2011 - present American College of Clinical Pharmacy (ACCP)
2004 - present Pharmacy Council of Thailand

Penchun Saenprasarn , RN, EdM
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

Piya Samankatiwat, MD
Cardiac Surgeon Unit, Department of Surgery,
Faculty of Medicine, Ramathibodi Hospital, Mahidol University,
Bangkok, Thailand

Title and/or Degrees:
Associate Professor/ MD

Educations:

2011	Diploma Thai Board of Critical Care Medicine, The Medical Council (Thailand)
2003	Diploma Thai Board of Family Medicine, The Medical Council (Thailand)
2002-2003	Certificate of paediatric cardiac surgical registrar (fellow), Great Ormond Street Hospital for Children NSH Trust, London, United Kingdom
2000-2001	MSc in Surgical Science, Faculty of Medicine, Imperial College of Science, Technology and Medicine, University of London, London, United Kingdom
2005-2006	Diploma Thai Board of Cardiothoracic Surgery, The Medical Council (Thailand)
1991-1995	Diploma Thai Board of General Surgery, The Medical Council (Thailand)
1991-1992	Diploma, Basic Science in Surgery, Faculty of Medicine, KhonKaen University, Khon Kaen, Thailand
1985-1991	M.D. (2nd Class of Honours, Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand

Internships and Residencies:

1996-1998	Cardiothoracic Surgery, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
1991-1995	General Surgery: under Professor Thong-ueb Uttaravichien (FRCSE), Srinagarind Hospital, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Licences and Certifications:

2-5 April 2002	Cardiology in the Young, Great Ormond Street Hospital, London
1 February – 31 July 2001 and 1 October 2001 – 28 February 2002	Honourary Observer, Hammersmith Hospital, Faculty of Medicine, Imperial College of Science, Technology and Medicine, London
March 2001	Principles of Immunocytochemistry, Imperial College of Science, Technology and Medicine, London
February 2001	The Cellular & Molecular Biology of Cancer, Imperial College of Science, Technology and Medicine, London

Academic Appointments:

April 2012	Associate Professor, Department of Surgery, Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand
January 2000	Assistant Professor, Department of Surgery, Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand
November 1998	Lecturer, Department of Surgery, Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand
July 1995	Lecturer, Department of Surgery, Srinagarind Hospital, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Poukwan Arunmanakul, MSc (Clinical Pharmacy), PharmD, BCPS
Pharmaceutical Care Department,
Faculty of Pharmacy, Chiang Mai University,
Chiang Mai, Thailand

Title and/or degrees:
Assistant Professor, M.Sc., Pharm.D., BCPS

Educational:

2015 Board Certification in Pharmacotherapy (B.C.P.), Pharmacy Council of Thailand
2014 Board of Certified Pharmacy Specialist (B.C.P.S.), American Pharmacist Association (APhA)
2007 Doctor of Pharmacy, College of Pharmacy, University of Florida, USA
1999 Master degree in Clinical Pharmacy, Faculty of Pharmacy, Mahidol University, Thailand
1995 Bachelor degree in Pharmacy, Faculty of Pharmacy, Chiang Mai University, Chiang Mai, Thailand

Biographical sketch:

Poukwan Arunmanakul received her bachelor degree of Pharmacy from Faculty of Pharmacy, Chiang Mai University, Master degree in Clinical Pharmacy from Mahidol University, Pharm D Degree from University of Florida in 2008. She also received Board Certified Specialist from American Pharmacist Association in 2014 and Board Certification in Pharmacotherapy from Pharmacy Council of Thailand in 2015. She joined the Faculty of Pharmacy, Chiang Mai University in 2002 and now holds the position of Assistant Professor in the Department of Pharmaceutical Care. She is a member of American College of Clinical Pharmacy (ACCP)

Apart of being a faculty member, Poukwan works as a clinical pharmacist in Heart failure clinic at Maharaj Nakorn Chiang Mai hospital, a University hospital, since 2009. She is also an active administrative member of Community of Pharmacist for Heart and Vascular diseases of Thailand (CoP-HATHAI). Her area of interests focus on pharmacological treatment in Cardiovascular Diseases especially in Heart failure and Anticoagulation patients. Her interest includes the impact of pharmacists in variety stages in Cardiovascular diseases. Poukwan received Dean's honor roll from University of Florida in spring 2008 and received Best teaching award from Faculty of Pharmacy, Chiang Mai University in 2015

Pranya Sakiyalak, MD
Division of Cardiovascular Surgery,
Department of Surgery, Siriraj Hospital,
Mahidol University, Bangkok, Thailand

Title and/or degrees:
MD

Education and Training:

1985-1986	Pre-Medical Studies, Faculty of Science, Mahidol University Salaya, Nakornprathom, Thailand
1985-1991	MD., Faculty of Medicine, Siriray Hospital, Mahidol University
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

Licenses and Certificates:

April, 1991	Thai Medical Licence
November, 1992	ECFMG Certificate
January, 1996	Medical License, State of Michigan
August, 1996	Medical License, State of Ohio
July, 2000	Medical License State of Illinois
April, 2001	American Board of Surgery
June, 2003	American Board of Thoracic surgery

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

Ratchanee Saelee, MD
Cardiology Unit, Department of Medicine,
Faculty of Medicine, Ramathibodi Hospital, Mahidol University,
Bangkok, Thailand

Title and/or Degrees:
Assist. Prof. /MD

Position: Cardiopulmonary resuscitation unit staff, Department of Internal Medicine, Faculty of Medicine, Ramathibodi Hospital Mahidol University

Education & Work Experience:

Medical School:	Faculty of Medicine (first class honor) Chulalongkorn University, Thailand 1994-2000
Internship:	Faculty of Medicine Srinakarind Hospital, Kon-Kaen University Thailand 2000-2001
Residency:	Faculty of Medicine Srinakarind Hospital, Kon-Kaen University, Thailand 2001-2004
Cardiology Fellow:	Cardiology Division, Department of Internal Medicine Faculty of Medicine Ramathibodi Hospital Mahidol University, Thailand 2004-2006
Interventional Cardiology:	Cardiology Division, Department of Internal Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol university, Thailand 2006-2007

Board Certification:
- Medical Degree
- Diploma Thai Board of Internal Medicine
- Diploma Thai Board of Cardiology
- Certificate Interventional Cardiology, Ramathibodi hospital, Mahidol University, Thailand
- Diploma Thai Board of Critical Care medicine
- Diploma National Board of Echocardiography, American Society of Echocardiography

Membership:
Medical Council of Thailand
Royal College of Physician of Thailand
The Heart Association of Thailand under the Royal Patronage
Thai Resuscitation council of Thailand
Cardiac Intervention Society of Thailand

Award during training:
2004 Research award for 3rd year residency research from the Royal College of Physician of Thailand
2005 Research award for 1st year fellowship from the Heart Association of Thailand under the Royal Patronage of H.M. the King
2006 3rd winner of young investigator award from SingLive interventional cardiology 2008, Singapore

Ratthapon Wongwandee, MD
Department of Pediatrics (Cardiology),
Faculty of Medicine, Thammasat University,
Pathumthani, Thailand

Title and/or degrees:
Assistant Professor/ MD, FSCAI

Current Position:

- Lecturer, Department of Pediatrics (Cardiology), Faculty of Medicine, Thammasat University, Pathumthani, Thailand
- Certified PALS AHA Instructor (2016-2018)

Education:

2001 MD with Second Class Honor, Chulalongkorn University, Thailand
2003 Higher Grad. Dip. in Clinical Medical Sciences (Pediatrics), Khonkaen University, Thailand
2005 Thai Board of Pediatrics, Khonkaen University, Thailand
2008 Thai Sub-board of Pediatric Cardiology, Ramathibodi Hospital, Mahidol University, Thailand
2013 Fall Fellow Courses SCAI 2013, Las Vegas, Nevada, USA
2016 Good Clinical Practice (GCP), Faculty of Medicine, Thammasat university, Thailand

Experience:

- Primary operator for transcatheter treatment in congenital heart disease (CHD) (eg. ASD/VSD/ PDA closure, stent implantation, balloon dilation, vascular occlusions) over 500 cases

Organizing committee:

- Communication skill under The Royal College of Pediatricians of Thailand: 2009-2012
- PALS Course director and PALS instructor of Thai Resuscitation Council (TRC) 2017
- Faculty member for 7th Vietnam annual congress of congenital and structural heart disease, January 4-6, 2017

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

Title and/or Degrees:
Professor/ MD, 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

Present position: Lecturer and consultant in cardiology

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
1994	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

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

Sarinya Puwanant, MD, FASE
Attending Physician, Cardiology, Chulalongkorn University
and King Chulalongkorn Memorial Hospital,
Bangkok, Thailand

Title and/or degrees:
MD, FASE

2007-2008	Clinical Fellow, Cardiac Imaging, Cleveland Clinic, Ohio, USA
2006-2007	Clinical Fellow, Heart Failure and Transplantation, University of Florida, USA
2005-2006	Research Fellow, Echocardiography, Mayo Clinic, MN, USA
2002-2004	Cardiology Fellow, Siriraj Hospital, Mahidol University
1998-2002	Internal Medicine Resident, Prince of Songkla University
1998	M.D., Prince of Songkla University

Sayamon Sukkha, PharmD
Department of Pharmacy, Faculty of Pharmacy
Mahidol University, Bangkok, Thailand

Title and/or degrees:
Pharm.D

Academic Background:

2014 - present	Nephrology Research Fellow, The College of Pharmacotherapy of Thailand, Bangkok, Thailand
2012 - 2014	Specialized Residency in Nephrology Pharmacotherapy, The College of Pharmacotherapy of Thailand
2011 - 2012	General Residency in Pharmacotherapy, The College of Pharmacotherapy of Thailand, Thailand
2004 - 2009	Doctor of Pharmacy, Srinakharinwirot University, Nakornnayok, Thailand

Licensure:

2010 - present	Thailand licensed Pharmacist

Professional Affiliations:

2016 - present	The Transplantation Society (TTS)
2015 - present	Thai Renal Pharmacist Group (T-RPG)
2014 - present	Thai Transplantation Society

Smadar Kort, MD, FACC, FASE, FAHA
Clinical Professor of Medicine,
Stony Brook University Medical Center,
NY, USA

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

Higher Education:

1989 - 1993	MD	Sackler School of Medicine, Tel Aviv, Israel
1982 - 1985	B.Sc	Tel Aviv University, Tel Aviv, Israel

Internship and Residency:

1994 - 1996 Resident, Cornell University Medical College, New York, NY, USA
1993 - 1994 Intern, Cornell University Medical College, New York, NY, USA

Clinical and Research Fellowship:

	Degree & Date	Institution & Location	Field
2007	Mini Fellowship	University of California Los Angeles, USA	Cardiac CT
1999-2000	Advanced Fellow	York University Medical, New York, NY, USA	Echocardiography
1996-1999	Cardiology Fellow	Cornell University Medical College, New York, NY, USA	Cardiology
1987-1989	Research Assistant	University of Southern California, Los Angeles, CA, USA	Endocrinology
1984-1985	Research Assistant	Tel-Aviv University, Tel-Aviv, Israel	Microbiology

Certification & Licensure:

2014	MitraClip Course Training
2012	Transcatheter Heart Valve Fundamentals Training
2008	Level III certified in Cardiac CTA
2001, 2010	National Board of Echocardiography, Comprehensive Board Certification in Adult Echocardiography
2000, 2010	National Board of Echocardiography, Successful Completion of the Examination of Special Competency in Adult Echocardiography
1999, 2009	American Board of Internal Medicine, Subspecialty Board in Cardiovascular Disease
1996	American Board of Internal Medicine
1995	New York State Physician License

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

Somchai Prechawat, MD
Cardiovascular Unit, Department of Medicine
King Chulalongkorn Memorial Hospital
Bangkok, Thailand

Title and/or degrees:
Assistant professor/ MD

Educations and Training:

1982 – 1987	Medical Student Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand
1988 – 1991	Medical doctor at Khon-Kaen Regional Hospital, Khon-Kaen, Thailand
1991 – 1994	Residency in Internal Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand
1994 – 1996	Clinical Fellowship in Cardiovascular, Department of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand
1996 – 1997	Assisting physician for radiofrequency ablation in Electrophysiologic laboratory, Department of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand
1996 - 1997	Cardiologist at Bangpakok Hospital, Bangkok, Thailand
1997 – now	Attending staff in Cardiovascular Unit, Department of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Degrees and Certificates:

1987	Doctor of Medicine, Chulalongkorn University, Bangkok, Thailand
1992	Diploma in Clinical Science in Internal Medicine, Chulalongkorn University, Bangkok, Thailand
1993	Certificate Thai Board of Internal Medicine
1995	Certificate Thai Board of Cardiovascular Disease

Memberships and Awards:
Elected as chief medical resident in 1994
Elected as chief fellow of cardiology in 1996
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 Heart Association 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

Supaluck Kanjanauthai MD, CCDS, CEPS
Clinical Instructor, Pediatric Cardiology Division
Department of Pediatrics
Faculty of Medicine Siriraj Hospital
Bangkok, Thailand

Title and/or degrees:
MD, CCDS, CEPS

Education:

July 2011- June 2013	Pediatric Cardiac Electrophysiology Fellowship The Heart Institute for Children, Advocate Christ Medical Center and Advocate Hope Children's hospital, Oak Lawn, IL, USA
July 2008- June 2011	Pediatric Cardiology Fellowship, The Heart Institute for Children, Advocate Christ Medical Center and Advocate Hope Children's hospital, Oak Lawn, IL, USA
July 2005- June 2008	Pediatric Residency, University of Illinois at Chicago Medical Center, Chicago, IL, USA
October 2004-March 2005	Clinical Observership, Division of Pediatric Rheumatology, Children's Hospital of Pittsburgh, Pittsburgh, PA, USA
April 2003-Januaury 2004	Internship, Thammasart University Hospital, Pathumthani, Thailand
May 1997-March 2003	Medical School, Faculty of Medicine at Siriraj Hospital, Mahidol University, Bangkok, Thailand

HONORS and AWARDS:

May 2012	MVP Star Award Nominee – Physician Advocate Health Care, Advocate Christ Medical Center
May 2012	2012 Magnet Awards Nominee – Physician partnership Advocate Health Care, Advocate Christ Medical Center
October 2011	MVP Excellent Award Winner Selected as monthly MVP excellent award winner, Advocate Health Care , Advocate Christ Medical Center
June 2008	Outstanding Senior Pediatric Resident Selected as the most outstanding Senior Pediatric Resident among the Senior Pediatric residents by Department of Pediatrics University of Illinois at Chicago, USA
June 2007	Outstanding Pediatric Resident Selected as the most outstanding PGY-2 Pediatric Resident among the PGY-2 Pediatric residents by Department of Pediatrics University of Illinois at Chicago, USA
2006	2006 American College of Rheumatology Meeting Scholarship Recipient Selected to participate in the Pediatric Rheumatology Residents Program at the ACR/ARHP Annual Scientific Meeting in Washington, DC, USA
March 2003	First-Class Honor First-Class Honor in Medical Degree Faculty of Medicine at Siriraj Hospital, Mahidol University, Bangkok, Thailand
April 2002	Outstanding Pediatrics Extern Selected as one of the outstanding medical student during pediatric rotation Faculty of Medicine at Siriraj Hospital, Mahidol University, Bangkok, Thailand

Suphot Srimahachota, MD, FACS
Division of Cardiovascular Disease, Department of Medicine,
King Chulalongkorn Memorial Hospital,
Bangkok, Thailand

Title and/or degrees:
Associate Professor; MD, FACS

Education:

1982 - 1988	MD, Faculty of Medicine, Chiangmai University, Chiangmai, Thailand (GPA = 3.23)
1992	Thai Board of Internal Medicine
1993	Subspecialty Thai Board of Cardiology
1998 - 1999	Interventional cardiac fellow, Department of Cardiology, Leiden University Medical Centre, the Netherlands
2002	Subspecialty Thai Board of Critical Care.
2008	Certificate Thai Board of Cardiovascular Intervention

Professional experience:

1988 - 1992	Resident in Internal Medicine, Department of Medicine, Chiangmai University Hospital, Chiangmai, Thailand
1992 - 1994	Approved clinical cardiac fellow, Cardiology unit, Department of Medicine, Chulalongkorn University Hospital, Bangkok, Thailand
1998 – 1999	Intervention cardiac fellow, Department of Cardiology, Leiden University Medical Center, Netherlands
1994 - present	Thai Red Cross staff in Cardiology unit, Department of Medicine, Chulalongkorn University Hospital, Bangkok, Thailand
1994 - 1997	Sub-committee for examination of Thai Board of Cardiology
1998 - present	Sub-committee for examination of Thai Board of Cardiology
1998 - present	Sub-committee for examination of Thai Board of Internal Medicine
1999 - 2008	Committee of Thai Cardiac Rehabilitation Society
2000	Assistant Professor, King Chulalongkorn Memorial Hospital
2000 - 2011	Sub-committee of Thai Resuscitation Council
1999 - present	Sub-committee of Cardiopulmonary Resuscitation, Faculty of Medicine, King Chulalongkorn Memorial Hospital
2000 - 2001	Sub-committee of Cardiac center, King Chulalongkorn Memorial Hospital
2000 - 2002	Sub-committee of organ transplantation, King Chulalongkorn Memorial Hospital
2001 - 2008	Steering committee and executive committee of Acute coronary syndrome registration project, Thai Heart Association
2001 - present	Sub-committee of Cardiopulmonary Resuscitation Training of King Chulalongkorn Memorial Hospital
2003 - 2004	Organizing committee of 15th Asean Congress of Cardiology
2003	Secretarial and sub-committee of development of evidence-base clinical practice guideline for Internal Medicine
2004 - 2005	Committee of Thai Society of Hypertension
2004	Associate Professor
2005	Subcommittee of Metabolic syndrome; Royal College of Physician of Thailand
2006 - 2008	Secretarial of Cardiovascular Interventional Society of Thailand

2008	Coordinator for 2nd IAEA/RCA Meeting of the Network of Cardiologists Trained by the IAEA in Radiation Protection, 24-26 June 2008, BKK, Thailand
2007-2008	Secretary of 4th AICT meeting on June 25 – 27, 2008, Bangkok, Thailand
2008-2012	Sub-committee for examination of Thai Interventional Board
2008-2013	Treasure of Cardiovascular Interventional Association of Thailand
2009	AHA certified ACLS Instructor
2010	Sub-committee of Cardiac center, King Chulalongkorn Memorial Hospital
2010-2012	Organizing committee of 6th Asia Pacific Congestive Heart Failure
2010	International Atomic Energy Agency (IAEA) expert for radiation protection in cardiology
2011-2013	Associate Editors for Journal of Biomedical Graphics and computing
2012-2013	Treasure of 9th AICT 2013, Bangkok, Thailand
2012-2014	Committee of Cardiovascular Interventional Association of Thailand

Field of Interest: Intervention Cardiology, Structural Heart Intervention, Device development research

Membership:

1988	Medical Council of Thailand
1993	Royal College of Physicial of Thailand
1994	The Heart Association of Thailand
1995	The Cardiovascular Intervention Association of Thailand
1995	The Thai Hypertension League
1995	Thai Cardiac Rehabilitation Society
2002	The Thai Society of Critical Care Medicine
2009	ESC membership

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

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:

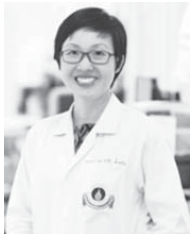
June 1985 - March 1991	MD, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand
July 1992 - June 1993	Pediatric Residency, Seton Hall University, Department of Pediatrics, Jersey City Medical Center Jersey City, New Jersey, USA Program Director: Oradee Chandavasu, MD
July 1993 - June 1996	Internal Medicine Residency, University of Medicine and Dentistry of New Jersey Department of Internal Medicine, Newark, New Jersey, USA Program Director: George Lodi, MD
July 1996 - June 1999	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 1993 Pennsylvania,	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



Tarinee Tangcharoen, MD
Cardiology Unit, Department of Medicine,
Faculty of Medicine, Ramathibodi Hospital,
Mahidol University, Bangkok, Thailand

Title and/or degrees:
Assistant Professor, MD

Degree:

1997	Medical degree (M.D.) with honor Chulalongkorn University, Bangkok, Thailand
2001	Thai Board of Internal Medicine
2003	Thai Board of Cardiologist

Working Experience:

1997 - 1998	Internship in Sirinakarind Hospital, Khon Kaen, Thailand
1998 - 2001	Internal Medicine Resident
2001 - 2003	Cardiology Fellowship, Siriraj Hospital, Mahidol University, Bangkok, Thailand
2003-May 2004	Non-invasive cardiology fellowhship (Echocardiography), Siriraj Hospital, Mahidol University, Bangkok, Thailand
August 2004 - December 2006	Research fellowship in cardiac MRI (qualified for level 3 training) (grant from Kaiserin-Friedrich-Stiftung) German Heart Institute, Berlin, Germany
February 2007 - January 2008	Clinical research fellow (congenital heart disease cardiac MRI) Guy's and St. Thomas Hospital, King's College University of London, London

Award during training:

1993	Highest score in Psychiatry Award
2002	Research award from Thai Cardiology Society for 1st year fellowship

Taworn Suithichaiyakul, MD
Division of Cardiology, Department of Medicine,
Faculty of Medicine, King Chulalongkorn Memorial Hospital,
Bangkok, Thailand

Title and/or degrees:
Associate Professor C.9/MD

Educations and Previous Apponintments:

1972-1978	Medical Student Faculty of Medicine, Chulalongkorn University
1978-1979	Internship, Subprasitthiprasong Hospital, Ubolrachathani
1979-1982	Resident Training, Internal Medicine, King Chulalongkorn Memorial Hospital
1982-1984	Clinical Fellowship in Cardiovascular, Department of Medicine, King Chulalongkorn Memorial Hospital
1985	Research Fellowship in Cardiovascular (Electrocardiography) Japan
1983-1986	Instructor, Department of Medicine, Faculty of Medicine, Chulalongkorn University
1986-1993	Assistant Professor, Department of Medicine, Faculty of Medicine, Chulalongkorn University
1987-1989	Research Fellowship in Cardiovascular [Hypertension] U.S.A
1993- Present	Associate Professor, Department of Medicine, Faculty of Medicine, Chulalongkorn University

Degrees and Certificates:

1977	Bachelor of Sciences, Chulalongkorn University
1987	M.D. , Chulalongkorn University
1980	Dip. Clinical Science in Internal Medicine, Chulalongkorn University
1982	Thai Board of Internal Medicine
1994	Thai Board of Cardiovascular Disease

Memberships and Awards:
Member of The Royal College of Physician of Thailand
Member of The Medical Association of Thailand
Member of The Medical Council
Member of The Thai Heart Association of Thailand
Member of The Thai Coronary Intervention Club
Member of The Thai Hypertension Society

Present Position:
President of The Heart Association of Thailand under the Royal Petronage
Viee President of The Thai Hypertension Society

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
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:
Associate 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

Vichai Benjacholamas, MD
Cardio-thoracic Unit, Department of Surgery,
King Chulalongkorn Memorial Hospital,
Bangkok, Thailand

Title and/or degrees:
Associate Professor, MD

Education:

1977-1981	BS, Chulalongkorn Medical School, Thailand
1981-1983	MD, Chulalongkorn Medical School, Thailand

Training:

1983-1984	Rotating Intern-ship Khon-Khan Hospital, Thailand
1986-1989	Residency in General Surgery, Chulalongkorn Hospital, Medical School, Thailand
1989-1991	Residency in Thoracic Surgery, Chulalongkorn Hospital, Medical School, Thailand
1993-1994	Fellow in Pediatric Cardiac Surgery, Royal Children Hospital, Melbourne, Australia.
1994	Visiting Doctor at Hospital for Sick Children and Toronto, General Hospital, Toronto, Canada
1994	Visiting Doctor at Cleveland Clinic, Cleveland, Ohio, USA

Board Certifications:

1989	Diplomate, Thai Board of Surgery
1991	Diplomate, Thai Board of Thoracic Surgery
2002	Diplomate, Thai Board of Family Medicine
1994	Certificate in Pediatric Cardiac Surgery, Royal Children Hospital, Melbourne, Australia

Current Position:

- Associated Professor of Surgery and Chief of Cardio-thoracic unit, Department of Surgery, Chulalongkorn Hospital Medical School, Bangkok, Thailand
- Director of Cardiac Center, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

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

Title and/or degrees:
MD

Education:

2015	Clinical Fellow in Cardiovascular Medicine, (July-December) 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

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

Wipharak Bunmark, BSc Pharm
Clinical Pharmacy Division, Department of Pharmacy,
Faculty of Pharmacy, Mahidol University,
Bangkok, Thailand

Title and/or degrees:
BSc Pharm

Current Training:

2016 – present Cardiology research fellow, College of Pharmacotherapy of Thailand, Thailand
Monash University Malaysia (visiting researcher)
2014 - 2015 Specialized residency in cardiology pharmacotherapy, College of Pharmacotherapy of Thailand

Academic Background:

2013 General residency in pharmacotherapy, College of Pharmacotherapy of Thailand
2011 Bachelor of Science in Pharmacy (1st Honors), Mahidol University, Bangkok, Thailand

Professional Experience:

2013 - 2016 Cardiology Pharmacy Resident
Acute care unit:
- Cardiac Care Unit (CCU) of Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand
- Cardiac Care Unit (CCU) of Phramongkutklao Hospital, Bangkok, Thailand
- Cardiac Care Unit (CCU) of Maharaj Nahorn Chiang Mai Hospital,Faculty of Medicine, Chiang Mai University, Chiang Mai,Thailand
- Stroke Unit of Siriraj Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand
- Cardiovascular thoracic (CVT) ward of Siriraj Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand
- Internal medicine ward (focus on cardiac patient), Ramathibodi Hospital, Faculty of Medicine, Mahidol University
Bangkok, Thailand
- Internal medicine ward of Siriraj Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand

Ambulatory care unit:
- Warfarin Clinic of Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand
- Warfarin Clinic of Siriraj Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand
- Heart Failure Clinic of Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand
- Heart Failure Clinic of Maharaj Nakorn Chiang Mai, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Academic Appointment:

2011 - present Lecturer assistant, Department of Pharmacy, Faculty of Pharmacy, Mahidol University

Academic Awards/Achievements:

2007 Scholarship, Residency program, granted by Faculty of Pharmacy, Mahidol University

Research Projects & Experience:

2016 - present Efficacy and safety of antithrombotic regimens in patients undergoing PCI whom anticoagulant therapy are indicated- a systematic review and network meta-analysis Monash University Malaysia (visiting researcher), Selangor, Darul Ehsan, Malaysia

Professional Affiliations:

2011 - present Pharmacy Council of Thailand

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

Program

49th Annual Scientific Meeting
The Heart Association of Thailand under the Royal Patronage of H.M. the King

"Cardiology on the move"
24-25 March 2017, @ Sheraton HuaHin, Petchaburi

Date/Time 24 March 2017	Topic	Room
08:30-09:30 [Thai]	Imaging "Essential imaging in cardiac MR and cardiac CT: top 10 cases you should know how to read" *Rungroj Krittayaphong, MD* *Pairoj Chattranukulchai, MD* *Thananya Boonyasirinant, MD* **Moderator:** *Khunying Mallika wanakrairot, MD*	Room A Chanderia 1
08:30-09:30 [Thai]	FIT Track: ECG/EP "The EKG masterclass" *Thoranis Chantrarat, MD* *Thanawat Benjanuwattra, MD* *Somchai Prechawat, MD* **Moderator:** *Thanawat Benjanuwattra, MD*	Room B Chanderia 2
09:30-10:30 [Thai]	EP "Sudden cardiac death" Screening for population at risk *Kanchit Likitthanasombat, MD* Post cardiac arrest survivors, what should we do? *Tachapong Ngarmukos, MD* The role of ICD in primary prevention *Pattarapong Makarawate, MD* **Moderator:** *Tachapong Ngarmukos, MD*	Room A Chanderia 1
09:30-10:30 [Thai]	Echo "Fantastic diseases and where to find them" *Smonporn Boonyaratavej Songmuang, MD* *Teerapat Yingchoncharoen, MD* *Rungsrit Kanjanawanich, MD* **Moderator:** *Waraporn Tiyanon, MD*	Room B Chanderia 2

10:30-11:00	Coffee Break and visit Exhibition	
11 :00-12:15 [ENG]	**Opening address** by *Taworn Suithichaiyakul, MD* President the Heart Association of Thailand under the Royal Patronage of H.M. the King (15 mins) **Kasarn Jatikavanij Memorial Lecture** (30 mins) "Imaging in Heart Failure" *Bogdan Popescu, MD* President of EACVI (ESC) **Kamol Sindhvanandha Honorary Lecture** (30 mins) "Update heart failure guideline 2017" *Lee Goldberg, MD* (ACC) **Moderator:** *Rungroj Krittayaphong, MD*	Room A-B Chanderia 1-2
12:15-13:00 [Thai]	**Lunch symposium 1** by DKSH (Thailand) Co., Ltd (Tritace) "How ACEI speak out louder than ARB in CV risk patients" "ACEI as the first line therapy for CVD prevention" *Surapun Sitthisook, MD* **Moderator:** *Peera Buranakitcharoen, MD*	Room A Chanderia 1
12:15-13:00 [Thai]	**Lunch symposium 2** by AstraZeneca (Thailand) Co., Ltd "Should SGLT2i be the F1RST add on to Metformin?" **Welcome & Introduction:** *Rapeephon Kunjara Na Ayudhya, MD* - Extensive evidence of SGLT2i in glycemic, extra-glycemic and safety profile *Chaicharn Deerochanawong, MD* - SGLT2 inhibitors: where does this fit in CV risk management? *Wiwun Tungsubutra, MD*	Room B Chanderia 2
12:15-13:00 [ENG]	**Lunch symposium 3** by Servier (Thailand) Co., Ltd "Going further in the treatment of angina despite revascularization" *Professor Luis Henrique Wolff Gowdak, MD, PhD* **Moderator:** *Kriengkrai Hengrussamee, MD*	Room C Ballroom I
13:00-13:45	**Lunch**	@ the Deck
13:45-14:45 [ENG]	Highlight from ACC and ESC meeting ACC: Update guideline in VHD *Smadar Kort, MD* (ACC) ESC: STEMI 2017 *Borja Ibañez, MD* (ESC) **Moderators:** *Wacin Buddhari, MD* *Decho Jakrapanichakul, MD*	Room A Chanderia 1

13:45-14:45 [Thai]	FIT Track: Drug interaction quiz "Drug Interaction Quiz: Real-world cases of cardiac patients" *Surakit Nathisuwan, PharmD, BCPS* *Wipharak Bunmak, BS* *Janporn Kongwatcharapong, PharmD, BCP* **Moderator:** *Surakit Nathisuwan, PharmD, BCPS*	Room B Chanderia 2
14:45-15:45 [ENG]	Round table case discussion Case 1: Aortic stenosis Case presenter: *Nithima Rattanasit, MD* Case 2: Ischemic cardiomyopathy Case presenter: *Aekarach Ariyachaipanich, MD* ***Panelists:*** *Smadar Kort, MD (ACC),* *Bogdan Popescu, MD (ESC),* *Decho Jakrapanichakul, MD (Thai)* *Lee Goldberg, MD (ACC),* *Borja Ibañez, MD (ESC),* *Wacin Buddhari, MD (Thai)* **Moderators:** *Decho Jakrapanichakul, MD* *Teerapat Yingchoncharoen, MD*	Room A Chanderia 1
14:45-15:45 [Thai]	FIT Track: Physical Exam "The lost art of cardiac physical examination" *Kriengkrai Hengrussamee, MD* *Rungsrit Kanjanawanich, MD* **Moderator:** *Rapeephone Kunjara Na Ayudhya, MD*	Room B Chanderia 2
15:45-16:15	**Coffee Break and visit Exhibition**	
16:15-17:15 [ENG]	YIA **Moderator:** *Rungroj Krittayaphong, MD* **Judges:** *Presidents of ASEAN Society of Cardiology*	Room A Chanderia 1
16:15-17:15 [Thai]	FIT Track: Hemodynamics, Angiogram "Cine angiogram and hemodynamics" *Nakarin Sansanayudh, MD* *Krisada Sastravaha, MD* *Rungsrit Kanjanawanich, MD* **Moderator:** *Nakarin Sansanayudh, MD*	Room B Chanderia 2
17:30-18:30 [Thai]	Fellow Poster Presentation	State Room 2A+2B

Date/Time 25 March 2017	Topic	Room
08:30-09:30 [Thai]	CPR "Pitfalls in management of post cardiac arrest" *Rachanee Saelee, MD* "Roles of E-CPR in Thailand" *Pranya Sakiyalak, MD* **Moderator:** *Pranya Sakiyalak, MD*	Room A Chanderia 1
08:30-09:30 [Thai]	FIT Track: Statistics "What a busy clinician should know about statistics and epidemiology" *Sukit Yamwong, MD* *Kamol Udol, MD* **Moderator:** *Sukit Yamwong, MD*	Room B Chanderia 2
08:30-09:30 [Thai]	Health Care Professional/Nurse 1 ระบบการจำหน่ายผู้ป่วยโรคหัวใจยุคใหม่ "Discharge plan system in Cardiovascular patient for the new era" *Penchun Saenprasarn, RN, EdM* *Nawarat Suthipong, RN* *Bubpawon Srilum, RN, MPA* **Moderator:** *Bubpawon Srilum, RN, MPA*	Room C Ballroom I
09:30-10:30 [Thai]	Heart failure "Cardiomyopathy 2017" - HCM *Sarinya Puwanant, MD* - LVNC *Smonporn Boonyaratavej Songmuang, MD* - Amyloidosis *Adisai Buakhamsri, MD* **Moderator:** *Srisakul Chirakarnjanakorn, MD*	Room A Chanderia 1
09:30-10:30 [Thai]	Free Paper **Moderators:** *Rungroj Krittayaphong, MD* *Nakarin Sansanayudh, MD*	Room B Chanderia 2
09:30-10:30 [Thai]	Health Care Professional/Nurse 2 "แนวโน้มการพัฒนาการพยาบาลที่เป็นเลิศ" EBP & KM, Trend of EBP and KM for excellent cardiothoracic nursing care *Penchun Saenprasarn, RN, EdM* *Duangkamol Wattradul, RN, APN, DNS* *Kanogporn Jamsomboon, RN, PhD. HRD* **Moderator:** *Kanogporn Jamsomboon, RN, PhD, HRD*	Room C Ballroom I
10:30-11:15	**Coffee Break and visit Exhibition**	

10:30-11:15	HAT Business Meeting	Room D Ballroom II
11:15-12:15 [Thai]	Educational symposia "Beating the silent killer: evidence based patient care" (Takeda (Thailand) Co. Ltd) *Vichai Senthong, MD* "Antithrombotic Management in Atrial Fibrillation Patient undergoing PCI" (Bayer Thai Co.,Ltd) *Narathip Chunhamaneewat, MD* **Moderator:** *Songsak Kiertchoosakul, MD*	Room A Chanderia 1
11:15-12:15 [Thai]	Educational symposia "Moving forward in Type 2 DM Management - Advance treatment with GLP-1RAs"(Novo Nordisk Thailnd Co., Ltd) *Dilok Piyayotai, MD* "Vaccination in elderly: why cardiologists need to know about vaccine? (MSD (Thailand) Co., Ltd) *Taworn Suithichaiyakul, MD* **Moderator:** *Charn Srirattanasatavorn, MD*	Room B Chanderia 2
11:15-12:15 [Thai]	Health Care Professional/Nurse 3 "Networking for sustainable CVT care" *Eakarnantha Arnanthanitha, MD* *Jenjira Tantiviyavanit, Chanaikarn Kaewutai, RN* **Moderator:** *Eakarnantha Arnanthanitha, MD*	Room C Ballroom I
11:15-12:15 [ENG]	Fellow Research **Judges:** *Pyatat Tatsanavivat, MD* *Piyamitr Sritara, MD* *Smonporn Boonyaratavej Songmuang, MD* *Nakarin Sansanayudh, MD* **Moderator:** *Teerapat Yingchoncharoen, MD*	Room D Ballroom II
12:15-13:00 [Thai]	**Lunch symposium 4** by A Menarini (Thailand) Co., Ltd "A New Paradigm in the Treatment of Stable Coronary Artery Disease: Addressing the Gaps in Chronic Stable Angina" *Professor Peter Collins, MA (Cantab). FRCP, FESC, FACC* **Moderator:** *Dilok Piyayotai, MD*	Room A Chanderia 1

12:15-13:00 [Thai]	**Lunch symposium 5** by Thai Osuka (Thailand) Co., Ltd "Current & Ideal treatment of acute decompensated HF and unmet needs" *Rungsrit Kanjanawanich, MD* "New paradigm treatment of acute heart failure" *Vichai Senthong, MD* "Real world experience based case sharing" *Vichai Senthong, MD* **Moderator:** *Charn Srirattanasatavorn, MD*	Room B Chanderia 2
12:15-13:00 [Thai]	**Lunch symposium 6** by Daiichi Sankyo (Thailand) Co., Ltd "The most recent NOAC - Edoxaban: Latest evidence of stroke prevention in AF" *Wanwarang Wongcharoen, MD* **Moderator:** *Surapun Sitthisook, MD*	Room C Ballroom I
13:00-13:45	Lunch	@ the Deck
13:45-14:45 [Thai]	Pediatrics 1 Update in SCDs in the young Risk stratifications and genetic updates (40 mins) *Apichai Khongphatthanayothin, MD* *Supaluck Kanjanauthai, MD* Surgical Interventions for Young SCD Victims (20 mins) *Vichai Benjacholamas, MD* **Moderator:** *Supaluck Kanjanauthai, MD*	Room A Chanderia 1
13:45-14:45 [Thai]	Intervention "Outpatient management after revascularization" *Wiwun Tungsubutra, MD* *Krisada Sastravaha, MD* **Moderator:** *Wiwun Tungsubutra, MD*	Room B Chanderia 2
13:45-14:45 [Thai]	Health Care Professional/Pharmacist/Pharmacotherapy "2017 Review on cardiovascular drugs" *Chuthamanee Suthisisang, Ph D* *Surakit Nathisuwan, PharmD, BCPS* *Peerawat Jinathongthai, B.Sc.Pharm, BCP, BCPS* **Moderator:** *Chuthamanee Suthisisang, Ph D*	Room C Ballroom I
14:45-15:45 [Thai]	Pediatrics2 Mechanical circulatory support in infants to adolescents: Round table case discussion *Marut Chantra, MD* *Kriangkrai Tantiwongkosri, MD* *Vichai Benjacholamas, MD* **Moderator:** *Marut Chantra, MD*	Room A Chanderia 1

14:45-15:45 [Thai]	FIT Track: Imaging "Chest X-ray, Nuclear and MRI" *Burabha Pussadhamma, MD* *Chanika Sritara, MD* *Tarinee Tangcharoen, MD* **Moderator:** *Tarinee Tangcharoen, MD*	Room B Chanderia 2
14:45-15:45 [Thai]	Health Care Professional/Pharmacist/Pharmacotherapy Adverse drug reactions of CV drugs: What every healthcare personnel needs to kno *Surakit Nathisuwan, PharmD, BCPS* *Poukwan Arunmanakul, MSc., PharmD* *Ajjima Sarapakdi, MS* **Moderator:** *Surakit Nathisuwan, PharmD, BCPS*	Room C Ballroom I
15.45-16.15	**Coffee Break and visit Exhibition**	
16:15-17:15 [Thai]	Pediatrics 3 PDA: From baby to elderly, how to intervene? *Suphot Srimahachota, MD* *Piya Samankatiwat, MD* *Ratthapon Wongwandee, MD* **Moderator:** *Ratthapon Wongwandee, MD*	Room A Chanderia 1
16:15-17:27 [Thai]	Cardiology Got Challenge **Commentators:** *Surapun Sitthisook, MD* *Adisai Buakhamsri, MD* *Songsak Kiertchoosakul, MD* *Charn Srirattanasatavorn, MD* **Moderator:** *Kasem Rattanasumawong, MD*	Room B Chanderia 2
16:15-17:15 [Thai]	Health Care Professional/Pharmacist/Pharmacotherapy Cardiovascular pharmacotherapy in special population Morbidly Obese: *Krittin Bunditanukul, PharmD, BCPS.* Cardio-Oncology: *Lakkana Suwannoi, PharmD, BCPS.* Cardio-Nephrology: *Sayamon Sukkha, PharmD* **Moderator:** *Krittin Bunditanukul, PharmD, BCPS.*	Room C Ballroom I

Abstracts

Day 1; Friday, March 24, 2017

08:30-09:30

@ Room A; Chanderia 1

Imaging

Essential imaging in cardiac MR and cardiac CT: top 10 cases you should know how to read

Rungroj Krittayaphong, MD, FACC, FESC, FACP

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

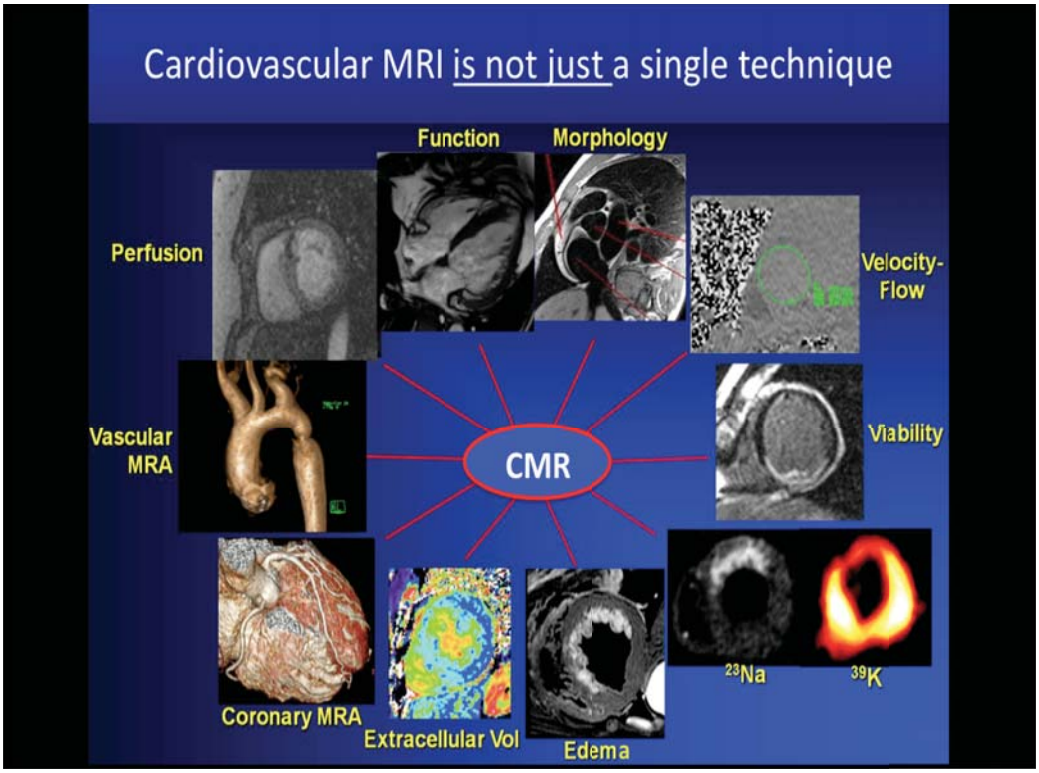
Cardiac magnetic resonance (CMR) is a useful tool to make diagnosis, to assess the future risk and to guide management in patients with known or suspected cardiac disease. Due to its high spatial and temporal resolution, the image quality is usually better than other investigation. Multiple information can be acquired by CMR such as cardiac function, perfusion and myocardial scar. CMR has a unique feature in tissue characterization. Therefore, it can be used to provide differential diagnosis of various cardiac disease. Case study is a learning pathway in CMR. In this session, we will start with the images of many interesting CMR cases and end with a short theory that explain the unique point for each case.

Essential imaging in cardiac MR and cardiac CT: top 10 cases you should know how to read

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

Cardiovascular Magnetic resonance imaging (MRI) is an advanced noninvasive modality that creates detailed pictures of heart, great vessels and adjacent tissues. It provides valuable information for a number of sophisticated clinical questions, as well as excellent soft tissue differentiation, high spatial and temporal resolution, and 3D/4D data acquisition. Nowadays, it is widely regarded as one of the most comprehensive diagnostic tools in cardiology, but also as a highly complex examination. Cardiac MRI uses radio waves as a radiofrequency transmitter and receiver, superconducting magnets, and a computer to display images of the organs and tissues without exposure to ionizing radiation. Cardiac MRI creates pictures of the heart, as it is beating, producing both still and moving pictures of the heart and major blood vessels. Besides providing the diagnosis of a variety of cardiovascular diseases such as coronary artery disease, vulvular heart disease, and complex congenital heart disease as well as identify etiology of cardiomyopathy, the result of cardiac MRI can be used as a risk marker, significant prognosticator and guide for treatment strategy in some certain patients.

The session "Essential imaging in cardiac MR: Top 10 cases you should know how to read" is aimed to highlight the engaging, typical cardiac MRI cases that cardiologists should be able to interpret.



Essential imaging in cardiac MR and cardiac CT: top 10 cases you should know how to read

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

Cardiac computed tomography (CT) has an emerging role in the evaluation of CAD.Cardiac CT is most value for the evaluation of anatomy. The spatial resolution of CT is very high leading to high image quality, as compared to other modalities. Moreover, the scan time is very short. However, there are some drawbacks including radiation exposure and contrast-induced nephropathy. Present technology could reduce radiation dose from more than 10 mSev to less than 1 mSev. Contrast-induced nephropathy warrants the proper screening of creatinine clearance as well as the preventive strategies such as adequate hydration. Another important limitation parameter is high heart rate. Tachycardia more than 60-70 per minute and irregularity pronounce the suboptimal image quality.

There are many roles of cardiac CT. The majority is to evaluate coronary artery disease using coronary calcium score and coronary computed tomography angiography (CTA). The studies regarding coronary CTA demonstrated cardiac CT as the roles of diagnosis and prognosticator. The consistent results revealed a high specificity and negative predictive value. Other roles of cardiac CT include the assessment of heart valves, pericardium, aorta, pulmonary arteries and veins. Cardiac CT could provide the useful information of the thicken pericardium in constrictive pericarditis, aneurysm and dissection in aorta in aortic aneurysm and aortic dissection, thrombus in pulmonary arteries in pulmonary embolism and anomalous of pulmonary veins in partial and total anomalous pulmonary veins (TAPVCs and PAPVCs respectively).

In conclusion, cardiac CT has the promising role in the diagnosis and prognosticator in variation of diseases based on its superb spatial resolution and fast acquisition. However, the appropriateness is the important consideration owing to its adverse events even minimal.

09:30-10:30
@ Room A; Chanderia 1
EP "Sudden cardiac death"

Screening for population at risk

Khanchit Likittanasombat, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Screening for sudden cardiac death (SCD) remains problematic as to how sensitive and how specific of the tests to identify those at risk. Advance techniques in screening individuals with asymptomatic coronary artery disease have been shown to offer certain benefit in prevention of SCD. In addition to usual screenings in adults with high risk of SCD, recent attention has been extensively emphasized on young athletes especially in those involve in competitive sports. Preparticipation electrocardiographic (ECG) screening is a very sensitive approach to detecting abnormalities conferring risk for SCD. More high technology tools such as echocardiography and CT scan have been integrated in an attempt to identify individuals with high risk of SCD, particularly in patients with post myocardial infarction and/or heart failure and young athletes. Genetic screening still plays a role in detecting familial disease with high risk of SCD. Brugada syndrome remains an unresolved problem for Thai population at large. The population at risk of SCD should be identified and properly dealt with accordingly.

Post cardiac arrest survivors, what should we do?

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

Once one resuscitated a patient back to life, there are many things one can do?

First, assessed how much brain function the patient has left, which might help determine the next steps. Then one probably wants to figure out the etiology and precipitating factors for the cardiac arrest, and then treat the conditions to prevent recurrent attack. It is important to know the rhythm of the patient during cardiac arrest

Prior to discharging the patient from the hospital one needs to consider what can we to prevent another attack, these encompass many approaches; medications that can prevent VT/VF, catheter ablations for WPW or VT/VF, defibrillator implantation for secondary prevention of arrhythmic death.

This session would give a quick overview on what to do for post cardiac arrest surviours

11:00-12:15
@ Room A; Chanderia 1
Kasarn Jatikavanij Memorial Lecture

"Imaging in heart failure"

Bogdan A. Popescu, MD, PhD, FESC, FACC, FASE
President of EACVI (ESC)
"Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania
Non-invasive cardiac imaging plays a major role in the diagnosis, selection of therapy and assessment of prognosis in patients with heart failure (HF)

A cardiac structural abnormality, systolic dysfunction, diastolic dysfunction, or a combination of these abnormalities needs to be documented in patients who present with resting or/and exertional symptoms of HF to establish a definitive diagnosis of HF. It is important to demonstrate an objective evidence of structural or functional abnormalities since symptoms of HF are not specific. Moreover, cardiac imaging can identify the cause of HF, which is critical for properly selecting the treatment.

Echocardiography is the most common imaging technique used in HF patients. HF due to systolic dysfunction is relatively easy to diagnose by echocardiography which shows a reduced ejection fraction (EF). Furthermore, echocardiography can provide important prognostic factors like: left ventricle (LV) volumes, severity of mitral regurgitation, diastolic filling parameters, and pulmonary artery systolic pressure. Approximately half of patients in contemporary registries of HF have preserved ejection fraction. LV diastolic dysfunction is thought to be the main underlying pathophysiological abnormality in patients with HFpEF. No single echocardiography variable is sufficiently accurate to be used in isolation to make a diagnosis of LV diastolic dysfunction. Therefore, a comprehensive echocardiography examination incorporating all relevant parameters is recommended.

Cardiac magnetic resonance (CMR) is the most valuable alternative to echocardiography in patients with unfavorable acoustic window or in patients in whom characterization of myocardial tissue is needed. Unlike echocardiography, CMR measurements are independent of geometric assumptions, making CMR the gold standard technique for the assessment of EF and LV volumes. Accumulated evidence supports the incremental value of late gadolinium enhancement (LGE) technique in predicting outcome of HF patients with respect to clinical and other imaging risk factors.

Cardiac computed tomography (CCT) allows quantification of LVEF and LV volumes but is currently rarely used in patients with suspected HF. Contraindications such as contrast allergies and moderate to severe renal insufficiency can preclude the use of CCT. Slower and regular heart rates which are important for adequate image acquisition can not be obtained in many patients with HF. Also, breath-hold can be an issue for HF patients with dyspnea.

This lecture will discuss the role of different cardiac imaging techniques in the diagnosis of heart failure and the various prognostic parameters that this methods can provide.

11:00-12:15
@ Room A; Chanderia 1
Kamol Sindhvanandha Honorary Lecture

"Update heart failure guideline 2017"

Lee R. Goldberg, MD, MPH
Associate Professor of Medicine, University of Pennsylvania
Vice Chair of Medicine – Informatics. Medical Director, Heart Failure and Cardiac Transplant Program

This lecture will review the latest ACC/AHA Heart Failure Guidelines focusing on pharmacologic management including the two new classes of drugs, sacubitril/valsartan and ivabradine. In addition, a review of the staging and classification of heart failure will be reviewed as well as how neurohormonal blockade should be used to improve heart failure outcomes.

13:45-14:45
@ Room A; Chanderia 1
Highlight from ACC and ESC meeting

ACC Update on guidelines for management of patients with valvular heart disdease

Smadar Kort, MD (ACC)
Clinical Professor of Medicine, Stony Brook University Medical Center, NY, USA

The 2008 ACC/AHA guidelines for the management of patients with valvular heart disease were re-written in 2014 reflecting updates and changes in the approach, diagnosis and management of these patients.

Most significant changes outlined in the 2014 guidelines include:

1. Stages of valvular heart disease – Four progressive stages are described, based on valve anatomy, hemodynamics, hemodynamic consequences and symptoms.
2. Heart valve team – it is recommended that patients with severe valvular heart disease be managed by a team of multidisciplinary physicians with expertise in valvular heart disease
3. Heart valve centers of excellence – consultation or referral to center of excellence is recommended for asymptomatic patients with severe valve disease, those who would benefit from valve repair, and patients with comorbidities.
4. Evaluation of surgical and interventional risk – specific recommendations for assessment of surgical and interventional risk is provided to assist with selecting the most appropriate intervention for individual patients.
5. Exercise testing – it is recommended to perform exercise stress test to evaluate asymptomatic patients with severe disease to exclude the presence of symptoms, assess hemodynamic response to exercise and assess prognosis.
6. Aortic stenosis – new classification include very severe AS. Asymptomatic severe AS is divided into high gradients, low flow low gradients with reduced EF, low flow low gradients with preserved EF (paradoxical low flow low gradient severe AS). New indications for intervention include very severe AS with low surgical risk, asymptomatic severe AS with decreased exercise tolerance or exercise related drop in blood pressure, and symptomatic patients with paradoxical low flow low gradient severe AS.
7. Transcatheter aortic valve replacement – recommended for patients with an indication for aortic valve replacement but prohibitive or high surgical risk.
8. Management of primary MR – indications for mitral valve repair expended to include pathology of either leaflet even in asymptomatic patients with preserved LV function when repair is likely with low surgical mortality, or in the settings of atrial fibrillation or pulmonary hypertension. Transcatheter repair is indicated for severely symptomatic patients with favorable anatomy and prohibitive surgical risk.
9. Management of secondary MR – intervention for secondary MR is reasonable at the time of open-heart surgery for other pathology when the MR is severe, and not unreasonable when the MR is moderate. For symptomatic severe MR either replacement or repair can be performed.
10. Anticoagulation in mechanical prosthesis – low molecular weight heparin is recommended for bridging in patients with mechanical prosthesis when warfarin therapy needs to be interrupted.

Highlight from ACC and ESC meeting

ESC: STEMI 2017

Borja Ibanez, MD, PhD, FESC
Department of Cardiology, Hospital Fundación Jiménez Díaz, Madrid, Spain
Fundación Centro Nacional de Investigaciones Cardiovasculares. Carlos III (CNIC), Madrid, Spain

Treatment of acute myocardial infarction with ST-segment elevation (STEMI) has been significantly refined in the last decades. The wide implementation of reperfusion strategies (first pharmacological and lately interventional) has resulted in a significant reduction of STEMI-associated mortality. Besides reperfusion, pharmacological coadjuvant therapies and global management strategies have contributed to further reduce the mortality and morbidity of this frequent entity.

Within the last 5 years, new therapeutic strategies have been developed and these are about to be implemented in the daily practice. These include acute management, procedural aspects during primary angioplasty, acute and long-term adjuvant antithrombotic therapy, management of non-infarct related arteries, and management of myocardial infarction with non-obstructed coronary arteries. Recent evidences in these fields will be revised.

13:45-14:45
@ Room B; Chanderia 2
FIT Track: Drug interaction quiz

Drug interaction quiz: Real-world cases of cardiac patients

Surakit Nathisuwan, PharmD, BCPS
Clinical Pharmacy Division, Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand
Wipharak Bunmark, BSc Pharm
Clinical Pharmacy Division, Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand
Janporn Kongwatcharapong, PharmD, BCP
Pharmaceutical care unit, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Drug interaction, a phenomenon where multiple drugs given together may result in a change in response, is a common practical issue that clinicians have to encounter on a daily basis. Drug interaction is considered one of the leading causes of preventable adverse drug reactions, some of which could be serious or even life threatening. Two broad categories of drug interactions can be characterized including pharmacodynamic or pharmacokinetic interactions. A pharmacodynamic interaction occurs when two drugs given together act at the same or similar receptor site and lead to a greater (additive or synergistic) effect or a decreased (antagonist) effect. With a pharmacokinetic interaction, one drug affects the other's absorption, distribution, metabolism, or excretion resulting in a significant change in its plasma concentration. Depending on the nature of the interaction, this could lead either to the loss or exaggeration of its effect. While the majority of drug interactions are with little clinical consequences, some can be of clinical significance. Patient characteristics and therapeutic windows of involved drugs are the key factors that determine impact on patient outcomes. Patients with cardiac diseases tend to be older and with multiple comorbidities. As a result, cardiac patients are among one of the most vulnerable groups of population to suffer from drug interaction. Cardiovascular drugs are one of the most common groups of drugs susceptible to drug-drug interactions. Several characteristics including narrow therapeutic index, cytochrome P (CYP)-450 inducing and inhibiting effects, and multiple use of agents acting via the same pharmacologic effect, play important roles in the occurrence of serious adverse drug interactions. This case-based and interactive lecture will provide a concise yet practical concept for the audience on the key characteristics of commonly used cardiovascular drugs and their common drug interactions. After the end of the lecture, the audience should be able to understand the key concept of drug interaction, related drug information source, practical tips to prevent and/or manage drug interactions along with management of adverse events resulting from drug interactions of commonly used cardiovascular drugs.

14:45-15:45
@ Room B; Chanderia 2
FIT Track: Physical Exam

"The lost art of vardiac physical examination"

Kriengkrai Hengrussamee, MD
Department of Cardiology and Intervention, Central Chest Institute of Thailand, Nonthaburi, Thailand

In the era of advance cardiac imaging especially echocardiography is more popular in the young cardiologists than cardiovascular examination. However, the art of cardiovascular examination is essential for all cardiologists. We should teach our medical students, fellows and other medical personals to keep this valuables.

Basic tools or "five finger" approach of William Proctor Harvey for diagnosis of cardiovascular diseases consist of history taking, physical exam, chest x ray, ECG and lab. Bedside cardiovascular examination using eyes, five fingers and ears is the most important one. Majority of cardiac patients present with dyspnea, chest discomfort, palpitation and syncope. Most of them are caused by coronary heart disease, valvular heart diseases, congenital heart diseases and cardiomyopathies.

By inspection only we can diagnose Marfan syndrome with aortic regurgitation from Marfanoid picture and rhythmic bobbing of the head in synchrony with the heart beat so called de Musset's sign, severe TR from prominent pulsatile jugular vein or v wave and cannon A wave in complete heart block. Careful inspection reveals pertinent findings in specific diseases such as clubbing of fingers with cyanosis in Tetralogy of Fallot, differential cyanosis in Eisenmenger PDA, embolic phenomena such as splinter hemorrhage, Osler's node and Janeway's lesion in infective endocarditis, xanthelasma in dyslipidemia patients, web neck in Turner's syndrome, pectus excavatum, and pectus excarinatum in some congenital heart diseases.

By palpation of arterial pulse we can diagnose atrial fibrillation or total irregularity of arterial pulse, Watson's water hammers pulse in AR, tardus et parvus pulse in AS, bisferiens pulse in AS and AR or HOCM, pulsus alternans in left ventricular dysfunction and paradoxical pulse in cardiac tamponade.

By auscultation in apical or mitral area, tricuspid area, Erb's point, pulmonic area, aortic area,infraclavicular area and paravertebral area, heart sounds and murmurs will be heard and characterized of valvular heart diseases , congenital heart disease and cardiomyopathies such as mid diastolic murmur at mitral area in MS and AR , pan systolic murmur at tricuspid area in TR and VSD, early diastolic murmur at aortic area in AR and PR, systolic ejection murmur at aortic area in AS and continuous or machinery murmur at left infraclavicular area in PDA.

In conclusion, the accurate cardiovascular physical examination is the initial first step to screen and diagnose cardiovascular diseases. However, findings must be correlated with clinical signs and symptoms, confirmed and assessed their severities by echocardiography or other cardiac images or lab.The art and science of bedside CVS exam needs protection by all of us.

Day 2; Saturday, March 25, 2017

08:30-09:30

@ Room A; Chanderia 1

CPR

Pitfalls in management of post cardiac arrest

Rachanee Saelee, MD

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2010 AHA/ACC/ECC guideline have implemented the new chain of survival; integrated adult post cardiac arrest care, there are many publication regarding post cardiac arrest care that focus into 2 mains issues; post cardiac arrest cardiovascular intervention and therapeutic hypothermia.

In October 2015 AHA/ACC/ECC have launched the new guideline and the content in adult post cardiac arrest care has minor change this topic will focus in 2 components; coronary revascularization and targeted temperature management (to replace therapeutic hypothermia).

Coronary revascularization after Return Of Spontaneous Circulation (ROSC) is recommended for all STEMI patient and NSTEMI patient with unstable hemodynamic regardless of consciousness. The point of concern is consideration of coronary revascularization should not delay diagnosis and treatment of other causes of cardiac arrest. Common pitfall after the guideline 2015 is coronary angiogram is usually done before identifying other causes of cardiac arrest.

Targeted temperature management (TTM) in 2015 guideline is recommend to extend from 32-34 °C to 32-36 °C for at least 24 hours according to large RCT in 2013. This recommendation emphasized to choose the optimal temperature for individual patient's setting. The common pitfall for TTM is delay start TTM, despite there is no information regarding to golden period for start TTM, but the recommendation prefer to performed TTM as soon as possible, should not more than 12 hours after ROSC.

Prognostication in patient post cardiac arrest and return of spontaneous circulation who received targeted temperature management is recommended to assess after 72 hours after return to normothermia to avoid sedative effect. However, in patient who did not receive TTM the prognostication will be assessed after 72 hours after ROSC. Most misunderstanding for TTM is all patient undergoing TTM will survive with good cerebral performance category score(CPC). CPC score after TTM depends on many factor such as time to start CPR, CPR time, patient's comorbidity.

08:30-09:30
@ Room B; Chanderia 2
FIT Track: Statistics

What a busy clinician should know about statistics and epidemiology?

Kamol Udol, MD, MSc,
Division of Cardiovascular-Metabolic Disease Prevention, Department of Preventive and Social Medicine, and Her Majesty Cardiac Center, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
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Ability to understand and interpret clinical trials – a skill necessary for evidence-based clinical practice – requires basic knowledge of biostatistics and clinical epidemiology. A typical clinical trial aims to demonstrate the effect of an experimental intervention on patient-related outcomes compared to a control intervention. To understand a clinical trial, we need to recognize its primary research question. The answer to that question lies in the results of the trial. Determination of the effectiveness/efficacy of the experimental intervention involves comparison of the outcomes between the intervention and the control groups. Any difference in outcomes between the two groups may be real or may arise merely by chance. We calculate the probability that the difference of this magnitude or greater will happen just by chance. If this probability, called p value, is very small (< 5% or 0.05), then the observed difference is unlikely to be a chance finding and we conclude that it is genuine, i.e., the experimental intervention is effective. Appropriate statistical tests used to calculate the p value depends primarily on the type of outcome variables – chi-square or Fisher's exact test for binary outcomes, log rank test for time-to-event outcomes and independent t test for continuous outcomes.

One of the limitations of the p value is that it does not tell us the magnitude of effect of the experimental intervention. The p value can be extremely small despite trivial treatment effect if the sample size is large enough. We have to look for indices describing the magnitude of treatment effect. For a binary outcome, which is common in cardiovascular trials, there are several options. Risk difference (RD) or absolute risk reduction (ARR) is the risk of outcome in the control group minus that in the intervention group, assuming unfavorable outcome. The reciprocal of RD is another index called number needed to treat (NNT), which represents the number of patients who need to take the experimental intervention in order to prevent one additional outcome. Relative risk (RR) is the risk of outcome in the intervention group divided by that in the control group. Relative risk reduction (RRR) is the complement of RR, mostly expressed as percentage. Odds ratio (OR) is analogous to RR but the calculation is based on odds rather than risk. OR is not commonly used in clinical trials because it is a measure that is difficult to understand; RR is preferable. For a time-to-event outcome – a specific type of binary outcome that also concerns the time of outcome occurrence – hazard ratio (HR) is the usual measure of effect. It is principally the instantaneous RR averaged over time, and interpretation is similar to RR. The uncertainty of any particular estimate obtained from study sample is expressed as 95% confidence interval (CI) of that parameter – the range in which we are 95% sure that the true parameter is located. There is a link between p value and 95% CI. If the 95% CI includes the null value, the p value will be ≥ 0.05. Conversely, if it excludes the null value, the p value will be < 0.05.

Subgroup analyses are frequently carried out and reported in cardiovascular trials. The purpose of subgroup analyses is to explore whether patients with different specific characteristics (e.g. male vs. female, young vs. old, or mild vs. severe disease) experience similar effect of the experimental intervention. We do not consider the treatment effect in any particular subgroup in isolation. Rather, we compare the estimate of treatment effect between different subgroups and determine the probability that the observed difference is due to chance (p value for interaction). Absence of significant interaction supports that patients with different specific

characteristics obtain similar benefit. However, presence of significant interaction has to be interpreted cautiously and viewed as only hypothesis generation, as the finding may still be the play of chance despite small p value for interaction.

It is important that we evaluate the validity of the trial – the extent to which its results represent the truth – before believing it. Validity of a trial is compromised if it fails to incorporate various measures to reduce bias. Important measures that guard against bias in clinical trials include using concealed randomization technique in allocating subjects into study groups, appropriate blinding of involved individuals, having complete or nearly complete follow-up, and analyses of data according to the intention-to-treat principle. The greater extent of utilization of these measures, the more confident we are that the trial is valid and that its results are credible.

09:30-10:30
@ Room A; Chanderia 1
Heart failure

Cardiomyopathy 2017
Cardiac amyloidosis

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Amyloidosis, with only few exception, is a systemic disease due to deposition of amyloid protein which can involve many organ systems. However, clinical manifestation may be varied and depends on etiology of the amyloid protein and patient's comorbidity condition. The most common sources of amyloid protein are plasma cell (light-chain monoclonal gammopathy- AL) and liver (e.g. wild-type transthyretin-ATTRwt and mutated transthyretin-ATTRm). Patients may present with, for example, syncope due autonomic dysfunction or cardiac arrhythmia, carpal tunnel syndrome, skin bruise, gastrointestinal hemorrhage, proteinuria or even heart failure. The latter portray worst prognosis among types of organ involvement. In AL which account for 80% of all cases of systemic amyloidosis, cardiac involvement occurs around half of the cases. Derangement of cardiac function and ,also, in other organ is due to either direct structural damage or cellular dysfunction(proteotoxicity). Cardiac biomarker(cardiac troponin, BNP/NT-pro-BNP) and level of toxic light chain are used for staging and as prognosticators of cardiac amyloidosis in particular AL type. Hallmarks of cardiac amyloidosis are thick ventricles and diastolic dysfunction with restrictive filling pattern while left ventricular ejection fraction(LVEF) is still preserved. However, these resemble many cardiomyopathy with thick myocardium such as hypertrophic cardiomyopathy, arterial hypertension and other infiltrative myocardial diseases. Use of multi-modality cardiac imaging help differentiating diagnosis and guiding management of cardiac amyloidosis. Management of cardiac amyloidosis has two folds; treatment of heart failure and eradication of source of amyloid protein. My talk will cover current diagnostic algorithm, up-to-date and future management of cardiac amyloidosis.

09:30-10:30
@ Room C; Ballroom 1
Health Care Professional/Nurse 2

แนวโน้มการพัฒนาการพยาบาลที่เป็นเลิศ: EBP & KM.,
trend of EBP and KM for excellent cardiothoracic nursing care

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ดวงกมล วัตราดุลย์ APN., DNS.
กนกพร แจ่มสมบูรณ์, MNS.,PhD.HRD.

การบริการพยาบาลในปัจจุบันต้องเผชิญกับการเปลี่ยนแปลงมากมาย การจัดการในองค์กรจำเป็นต้องจัดให้เป็น องค์กรแห่งการเรียนรู้ (Learning Organization: LO) เนื่องจากความท้าทายและความกดดัน ไม่ว่าจะเป็นการเปลี่ยนแปลงของธรรมชาติในการทำงาน ความท้าทายในการแข่งขันของสภาพ สังคม เศรษฐกิจ ปัญหาสุขภาพ เช่น ปัจจุบัน การเพิ่มขึ้นของการเปลี่ยนแปลงที่เป็นไปอย่างรวดเร็วและไม่สามารถคาดการณ์ได้ นอกจากนี้ยังได้มีการกำหนดนโยบาย กฎหมาย รวมถึงกฎระเบียบที่เกี่ยวกับ LO เช่น พระราชกฤษฎีกาว่าด้วยหลักเกณฑ์และวิธีการบริหารกิจการบ้านเมืองที่ดี พ.ศ. 2546 หมวด 3 การบริหารราชการเพื่อให้เกิดผลสัมฤทธิ์ต่อภารกิจของรัฐ มาตรา 11

- LO คือ กระบวนการของการปรับปรุงการกระทำด้วยความรู้และความเข้าใจที่ดีกว่า (Fiol & Lyles) Peter M. Senge จากหนังสือ The fifth discipline: the art and practice of the learning organization ได้ให้นิยามว่าองค์กรแห่งการเรียนรู้ คือ “ที่ๆ บุคลากรได้ขยายความสามารถอย่างต่อเนื่องเพื่อสร้างผลลัพธ์ที่ปรารถนา ที่ซึ่งใส่ใจและให้ความสำคัญกับแบบแผนทางความคิดใหม่ๆ และการพัฒนาต่อยอดทางความคิด ที่ซึ่งแรงบันดาลใจเป็นอิสระ ที่ซึ่งบุคลากรมีการเรียนรู้อย่างต่อเนื่องและรู้ที่จะเรียนรู้ร่วมกันต่อเนื่องอย่างไร” ขณะที่การพิจารณาว่าองค์กรใดจัดเป็น LO นั้น พิจารณาจากองค์ประกอบ 4 ส่วน ได้แก่ LO (Learning Organization) องค์กรของการเรียนรู้ OL (Organizational Learning) กระบวนการเรียนรู้ในระดับองค์กร OK (Organizational Knowledge) องค์ความรู้หรือความรู้ที่สำคัญและจำเป็นขององค์กร KM (Knowledge Management) การจัดการความรู้

การพยาบาลก็เช่นเดียวกัน การจัดการให้องค์กรก้าวสู่องค์กรแห่งการเรียนรู้มีองค์ประกอบหลัก 3 ด้านได้แก่ ผู้นำองค์กรต้องเป็นผู้นำการเปลี่ยนแปลง การสร้างการเรียนรู้ในองค์กรให้ทีมงานมีสมรรถนะสูง มีโปรแกรม Residency กระบวนการจัดการเรียนรู้แบบมีส่วนร่วมและเน้นการเรียนรู้แบบ Authentic ที่ชัดเจน การนำหลักฐานเชิงประจักษ์มาปรับใช้ด้วยกระบวนการวิจัยและนวัตกรรมตามบริบทของแต่ละองค์กร การนำมาตรฐานและแนวปฏิบัติต่างๆมาปรับใช้ตาม สถานการณ์จริงติดตามส่งเสริมโดยการช่วยเหลือสนับสนุนอย่างเต็มที่จึงจะบรรลุเป้าหมายการพัฒนาการปฏิบัติการพยาบาลให้ผู้ป่วยเกิดความปลอดภัยมีมาตรฐาน บริการที่เป็นเลิศ ผู้ใช้บริการพึงพอใจสอดคล้องกับหลักวิทยาศาสตร์ตามบริบทในพื้นที่ในที่สุด

Health Care Professional/Nurse 2

Evidence based practice for excellent CVT nursimg

Duangkamol Wattradul, RN, APN, DNS
The Thai Red Cross College of Nursing

More than 20 years, nurses increasingly use research in practice, and use the evidence base practice to support specific nursing intervention in health care settings. Evidence-based practice (EBP) represents a broader concept. When nurses use the EBP approach, they go beyond the expertise of clinical nurses and nursing researchers, and consider the patient's preferences and values to guide patient care.

Evidence-based practice challenges nurses to look at the "why" behind existing methods and processes in the search for improvement nursing care. The existing literature, however, reports that nurses who utilize research evidence in their practices are more satisfied with their role and their patients have better clinical outcomes. Research also has shown that nurses' use of EBP improves patient outcomes and quality of life. Therefore, it is likely that encouragement EBP could lead to improvements in both patient and nursing outcomes.

A clinical practice guideline (CPG) is an evidence-based guide to clinical practice developed by experts in a particular field for direct application in clinical environments. There are a lot of examples of clinical practice guideline developed through the projects as follows:

- Developing a rapid response team to decrease incidents of code blue outside the ICU
- Evaluating appropriate clinical parameters for placement and removal of urinary catheters
- Instituting a hand hygiene educational video for visitors in the neonatal ICU
- Discussing how to determine whether chlorhexidine is a more effective skin antiseptic than other cleansing agents in preventing probable peripheral IV catheter-related infection
- Assessing adequacy of pain treatment in the first 24 hours of postoperative open heart surgery.
- Determining and developing CPG to promote smoking cessation in risk groups.

Evidence-based practice can be simple for nurses to use as innovation if they refer to already-developed evidence-based or clinical practice guidelines. Several expert groups have already undertaken systematic efforts to develop guidelines to help both healthcare providers and patients make informed decisions about care interventions. Clinical nurses can use a systematic approach to critique the existing research, rate the strength of the evidence, and establish practice guidelines. The overall goal of these types of efforts focuses on guiding practice and minimizing the variability in care, improving quality of care and enhancing good nursing outcomes.

Health Care Professional/Nurse 2

The development of a cardiac nursing online knowledge management model for cardiac centers in the upper central part of Thailand

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In this research, the researcher examines (1) the conditions and problems of knowledge management in addition to the body of requisite knowledge commanded by cardiac nurses at cardiac centers in the upper central region of the Kingdom of Thailand (Thailand), a region falling under the scope of the Ministry of Public Health's Health Service Region 4. Furthermore, the researcher describes and analyzes (2) a cardiac nursing online knowledge management model constructed in the course of this project. Finally, the researcher evaluates (3) this knowledge management model.

This research project unfolded in three steps seriatim as shown below.

In Step One, the researcher surveyed the conditions and problems in knowledge management and the body of requisite cardiac nursing knowledge commanded by cardiac nurses at cardiac centers in hospitals located in Health Service Region 4. In carrying out a survey research investigation, the researcher collected a sample population consisting of 68 head nurses and registered nurses responsible for the care of cardiac patients at hospitals in the aforementioned region. The hospitals serving as the foci of investigation were fourfold: Sara Buri Hospital, Phra Nakhon Si Ayutthaya Hospital, Pranangklao Hospital, and the Central Chest Institute of Thailand.

The research instruments were an open-ended questionnaire and a check list, as well as interviewing subjects at the cardiac centers as to the conditions and problems of knowledge management and the body of knowledge requisite to pursuing online cardiac nursing.

In Step Two, the researcher constructed a cardiac nursing online knowledge management model for the cardiac centers of concern. In this step, the researcher developed an online knowledge management model through constructing a story board and a website for knowledge management components in a quintet of aspects. The five aspects were (1) knowledge acquisition; (2) analysis and knowledge categorization; (3) knowledge storage in an online system; (4) knowledge transfer and sharing; and (5) knowledge application. The draft model was thereupon inspected by six experts for structural appropriateness and system usability. The experts also proffered recommendations for improvement. The data collected using the resultant model were analyzed using techniques of descriptive statistics, viz., mean and standard deviation.

In Step Three, the researcher evaluated the model with an experimental group of cardiac nurses using the one group pretest posttest design method. The experiment encompassed a period of four weeks. Retention was tested twelve weeks after the completion of the experiment. Using techniques of descriptive statistics, the data collected were analyzed in terms of mean and standard deviation. Additional analysis was conducted using the dependent t-test technique. Finally, the researcher evaluated the level of satisfaction evinced by members of the experimental group.

Findings are as follows:

1. In the course of surveying the conditions and problems of knowledge management in addition to the requisite body of cardiac nursing knowledge at the aforementioned hospitals, the researcher found three issues as follows:

1.1 Regarding conditions of knowledge management, it was found that knowledge acquisition resulted from attendance at academic meetings, text book reading, or online searching. Knowledge storage appeared in the form of storage in compact disc (CD) manuals. Knowledge transfer was effected by means of actual performance and discussion when work was undertaken. Knowledge application came about when practical guidelines were in the process of determination and when information was transferred.

1.2 Knowledge management problems ensued when these cardiac nurses were heavily overworked. Responsible parties were not clearly designated. Budget was insufficient for fully supporting work. Document storage was disorderly and so documents were difficult to locate when required. Needed technological instrumentation was insufficiently provided and available instrumentation was inconvenient to use.

1.3 The body of knowledge deemed necessary at cardiac centers for the development of an online system consisted of (1) warning signs and emergency nursing for cardiac patients; (2) the interpretation of electrocardiograms for nurses; and (3) nursing care for cardiac patients taking warfarin.

2. The online knowledge management model for these cardiac center nurses consisted of five components: (1) knowledge acquisition; (2) knowledge analysis and categorization; (3) knowledge storage in an online system; (4) knowledge transfer and sharing; and (5) knowledge application. The model was evaluated as being appropriate at the highest level. However, the aspect of system use was evaluated as being at a high level.

3. In their self-evaluation of their personal command of the necessary body of knowledge for online cardiac nursing, the experimental subjects averred that their knowledge was evinced at a higher level after the completion of the experiment than prior to the experiment at the statistically significant level of .01.

4. In respect to the evaluation of the retention of the contents of the three issues concerning the requisite body of knowledge for online cardiac nursing, no differences were found between twelve weeks after the experiment and after the immediate completion of the experiment at the statistically significant level of .01.

5. In evaluating the satisfaction of users with the online cardiac knowledge management system, it was found that satisfaction for all items was exhibited at a high level. Furthermore, the aspect of system use for all items was found to be satisfactory at a high level. By way of positive contrast, the aspects of ease and convenience in the use of the website and accuracy in displaying information showed satisfaction at the highest level.

11:15-12:15
@ Room C; Ballroom 1
Health Care Professional/Nurse 3

Networking for sustainable CVT care
The development of warfarin clinic and network in Pattani province

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Pattani hospital is a general hospital in Pattani province. At the present, the numbers of patient in Pattani hospital who take warfarin is 226 people, estimate to 1,327 visits. The warfarin clinic in Pattani hospital has been developed by a multidisciplinary teamwork such as physician, nurse, dental, nutritionists, social Medicine to service in all sides. In 2007, Pattani hospital developed a warning sign to remind that the patient is taking warfarin. The warning sign will present on OPD CARD, the POP UP on HOSxP, on prescription "Avoid IM Injection" and INR result on HOSxP. In addition INR result was revealed on HOSXP The objective of the warning sign and the present of INR result on HOSxP is to prevent adverse event from taking warfarin. In 2012, Pattani hospital research team studied the effects of pharmaceutical care on patients who take warfarin. The result shown that 20.61% of patients had warfarin related problems. About 46.51% of the problems were medication noncompliance. Adverse drug reactions accounted for 43.41% of the problems. In addition, the study identified 11.02% of prescribing errors for warfarin. Most of which (36.23%) resulted from not adjusting the dosage according to the patients' International Normalized Ratio (INR). One of the problems that we found in 2012 was the prescription error (11.2% of the total problem). Therefore, the system of warfarin clinic was developed in 2013 at Pattani hospital. Patient will meet pharmacist to detect the problem that happened from medicine. Then the pharmacist will gave the recommend dose to the doctor. In 2014, The tool which use to control INR was created; the table of warfarin dose adjustment was created to maintain the target INR and the table of warfarin standard dose. In 2015, Developed software which connects to HOSXP. The warfarin software will record the problems from the past visit, check the past medication and INR. Furthermore, the program will calculate the percent of warfarin dose adjustment. In 2016, The warfarin network has been developed between healthcare units to provide the same standard service for patients. The objectives is to develop the effective warfarin network by training. The target group is the pharmacists who work at primary hospital. The pharmacists have been given the warfarin information, checked the past history and address, and send the information to each District where patient is living. After that, primary hospital will send that information to health promoting hospital. The objective of warfarin network training is to set up the warfarin clinic in primary hospital. In conclusion, the development of warfarin clinic network in Pattani province prevents the risks from taking warfarin. The healthcare units serve the same service standard to prevents the occurrence of drug interaction, gives the information about precaution. And patients can access to the service at the primary hospitals.

13:45-14:45
@ Room C; Ballroom 1
Health Care Professional/Pharmacist/Pharmacotherapy

2017 Review on cardiovascular drugs
"A review of fibrinolytic agents used in acute coronary syndrome"

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Ischemic heart disease (IHD) is one of the 10 leading causes of death in world. In 2012, about 7.4 million people died from IHD, which was about 40% for the cause of death from cardiovascular disease. It remains the top cause of death for both high income and low and middle income countries (LMIC). STEMI is the most serious type of acute coronary syndrome (ACS) that involves in a total occlusion of coronary vessel and typically effects in a large area of myocardial injury. Reperfusion therapy is a key component to recover the coronary blood flow. Percutaneous Coronary Intervention (PCI) is the most effective reperfusion strategy. It is highly recommended by many current practice guidelines. However, its benefit depends on time as an early treatment could help in preventing large infarction area. A well-coordinated transferring system between the referring hospital and PCI setting is very important to guarantee the efficacy of PCI. It may be quite difficult to perform PCI in time in a real world where the number of PCI is inadequate. Moreover, the cost of PCI is rather high, including the medication to prevent a complication of PCI. Therefore, reperfusion therapy with fibrinolytic agents may be an optimal option for patient who cannot be able to undergo PCI, especially people who lives in the remote area or in LMIC.

Reperfusion therapy with fibrinolytic agents, in adjunct with antithrombotic therapy, is recommended by the clinical practice guidelines in patient with STEMI where PCI is inaccessible. Patients with acute chest pain suggesting of new ST elevation via electrocardiogram (ECG) are candidates for reperfusion therapy if they present within 12 hours (or up to 24 hours if there is clinical and/or ECG evidence of ongoing ischemia) from the onset of symptoms. Based on publication of phase III randomized control trials, several fibrinolytic agents are approved for reperfusion therapy, including streptokinase, alteplase, lanoteplase, tenecteplase, and reteplase. Fibrinolytic agents can be grouped into 2 types according to pharmacological property, non fibrin- and fibrin-specific agents. Well-recognized clinical practice guidelines prefer to use fibrin-specific agents due to a better patency rate with less antigenic. Whereas many low and middle income countries (LMIC) are still using streptokinase as a fibrinolytic of choice based on the cost of treatment with acceptable efficacy. Alteplase can be given by 2 different administration regimen, accelerated and non-aceerelated infusion alteplase. The evidence from GUSTO-I trial showing a better efficacy of alteplase with accelerated infusion regimen comparing with streptokinase in combination with parenteral anticoagulants. Reteplase and tenecteplase provide similar efficacy compared with alteplase, but these 2 new drugs is easier to administer with IV bolus only. Tenecteplase seems to be more preferred by many expert according to the lowest bleeding risk profile.

14:45-15:45
@ Room B; Chanderia 2
FIT Track: Imaging

"Chest X-ray, Nuclear and MRI"
Chest X-ray in cardiovascular medicine

Burabha Pussadhamma, MD
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Chest X-ray (CXR), albeit being the oldest method of imaging, is still the first and most common tool using in visualization of the heart and its related vessels. Many of cardiovascular disorders could be detected from CXR, e.g., heart failure, valvular heart disease, pericardial disease, disease of aorta, pulmonary vascular disease, and congenital heart disease. Interpretation of CXR firstly needs the fundamental knowledge of anatomical landmarks of each structure in thoracic cavity, and secondly the meticulous examining through all the interpretable structures. Other than making diagnosis, CXR also helps in guiding further appropriate investigations and choosing proper treatments.

Role of nuclear medicine in cardiovascular disease

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Division of Nuclear Medicine, Department of Diagnostic and Therapeutic Radiology, Ramathibodi Hospital, Mahidol University, Bangkok Thailand

Nuclear medicine myocardial perfusion study continues to contribute to the management of patients with suspected and established coronary artery disease, particularly in those with renal insufficiency, or those cannot be successfully imaged by other techniques. With new CZT SPECT camera and software, a reduction in the radioactivity administered to the patients with less acquisition time, resulting in less radiation and more patient comfort.

Other nuclear medicine studies available in Thailand include imaging of cardiac amyloidosis and the so-called multiple gated acquisition study (MUGA), a radionuclide-labelled red blood cell study to evaluate left ventricular ejection fraction in patients receiving cardiotoxic chemotherapy. In addition, with 18F-Fluorodeoxy glucose (FDG PET), myocardial viability, inflammation or infection of the large arteries and pericardium can also be assessed.

14:45-15:45
@ Room C; Ballroom 1
Health Care Professional/Pharmacist/Pharmacotherapy

Adverse drug reactions of CV drugs: What every healthcare personnel needs to know

Poukwan Arunmanakul, MSc, Pharm D, BCPS
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Patients with cardiovascular diseases are often prescribed multiple drugs and have higher risk for adverse drug reactions (ADRs) due to polypharmacy.(1) A study in a tertiary care hospital indicated that a total of 463 ADRs were reported from 397 patients. The cardiovascular drug related reports constituted 18.1% of the total 2188 ADRs reports. The most common ADRs observed were cough (17.3%), gastritis (7.5%) and fatigue (6.5%). A classification of ADRs showed that gastrointestinal system related reactions were the most frequently observed adverse reactions (20.7%) followed by respiratory system (18.4%). From the reported ADRs, the drugs most commonly associated with ADRs were found to be ACEIs (17.5%), statin (14.9%), aspirin (8.4%) and beta-blockers (8.4%). Cough, gastritis, fatigue and myalgia by ACEIs, aspirin, beta-blockers and statin respectively were found to be the most commonly reported ADRs among the cardiovascular drugs. A retrospective cohort study to examine ADRs patterns of patients admitted to a coronary care unit (CCU) were conducted in Singapore in 2014.(2) Of these 574 patients admitted to CCU, no major gender-related differences were observed in the prescription, drug utilization and ADRs patterns of study cohort. Higher drug utilization, ADRs rates, and longer duration of CCU stay were noted in patients aged more than 60 years. Another study to detect the ADRs in cardiovascular care unit, including 677 patients, had found that a total number of 189 ADRs were registered of which 22.2% were serious.(3) The highest ADRs rates were observed with Streptokinase (59.3%). The rate of preventable ADRs was 6.9%. The patients with lower weight and patients with smoking history who had concurrent diseases had a higher risk of experiencing ADRs. The rate of ADRs induced by cardiovascular drugs in this study was 24.2%, mainly on anti-arrhythmic and thrombolytic agents.

In conclusion, ADRs occur frequently in modern medical practice, increasing morbidity and mortality and inflating the cost of care.(4) Patients with cardiovascular disease are particularly vulnerable to ADRs due to their advanced age, polypharmacy, and the influence of heart disease on drug metabolism. The majority of significant ADRs involving cardiovascular drugs are predictable and therefore preventable. Better patient education, avoidance of polypharmacy, and clear communication between physicians, pharmacists, nurses and patients, particularly during the transition between the inpatient to outpatient settings, can substantially reduce ADR risk.

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3. Mohebbi N, Shalviri G, Salarifar M, Salamzadeh J, Gholami K. Adverse drug reactions induced by cardiovascular drugs in cardiovascular care unit patients. Pharmacoepidemiology and drug safety. 2010;19(9):889-94.
4. Faulx MD, Francis GS. Adverse drug reactions in patients with cardiovascular disease. Current problems in cardiology. 2008;33(12):703-68.

Adverse drug reactions of CV drugs: What every healthcare personnel needs to know

Ajjima Sarapakdi, MS
Pharmaceutical care unit, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Novel oral anticoagulants (NOACs) to prevent and treat thromboembolism have recently emerged as alternatives to warfarin. A number of NOACs have recently been marketed in Thailand. Novel oral anticoagulants are increasingly used for stroke prophylaxis in patients with non-valvular atrial fibrillation. While these agents offer a more predictable pharmacokinetic profile, the lack of readily available laboratory tests to monitor the level of anticoagulation and absence of an antidote or established therapies to reverse the anticoagulant effect make management of cases of over-anticoagulation challenging. Moreover, adverse effects of NOACs treatment are probably underreported. In Thailand serious adverse effects of NOACs have not recently been reported systematically. Since 2012, several NOACs, including dabigatran (Pradaxa®), rivaroxaban (Xarelto®) and Apixaban (Eliquis®) have been registered in Thailand. These drugs are also available in Siriraj hospital. Drug Utilization Evaluation (DUE) form is created jointly between a committee of haematology and cardiology to guide the prescriber in an appropriated choice and safe initiation of anticoagulation treatment. For example, avoid using in elderly patients, creatinine clearance less than 30 mL/min, patients are taking azoles antifungals groups or HIV drugs, pregnancy patients, patients who had underlying antiphospholipid syndrome or active cancer. Furthermore, patients generally suitable to start NOACs are poor INR control or labile INR. In addition to physician, pharmacist has to provide an information, brochure or anticoagulation card for prevention intentional adverse drug event. In order to use each NOAC properly, physician need to understand pharmacokinetic and pharmacodynamics properties of each drug, as well as efficacy and safety results from landmark clinical trials to maximize the benefit of these drugs to the patients.

16:15-17:15
@ Room A; Chanderia 1
Pediatrics3

PDA: From baby to elderly, how to intervene?

Transcatheter Closure qf Patent Ductus Arteriosus in Low Birth Weight Infant: First Report in Thailand
Ratthapon Wongwandee1, Boonchu Sirichongkolthong1, Paweena Kaladee1
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Background:

Incidence of patent ductus arteriosus (PDA) is high in preterm with low birth weight and it is known to be increased with some factors. Hemodynamic significant PDA increases risk of complications such as pulmonary edema, bronchopulmonary dysplasia, intraventricular hemorrhage, necrotizing enterocolitis and renal failure. Some patients response to NSAIDs such as Indomethacin, Ibuprofen lysine. Traditional approach in non-responder is surgery (ligation, division, clipping); however, surgery is not an innocent procedure. It has risks of respiratory compromise, chylothorax, recurrent laryngeal nerve injury, ligation of non-PDA. Transcatheter closure of PDA under 3 kg baby continues remain challenging due to difficult vascular access, variable duct diameter, temperature control and obstruction of adjacent vascular structures.

Method And Results:

We report 3 low birth weight infants with procedural age 6 day, 12 day, 3 month and procedural weight 2.4, 1.3, 2.7 kg, respectively. Three babies had vascular access time 2 minutes, 4 minutes, 30 seconds under ultrasound guided and procedure time 48, 58, 35 minutes, respectively. Hemodynamic significant PDA (tubular type) were 3, 4 mm in mid-diameter and 3 mm (short cone shape) in last case. All of them used only venous access, 4 Fr JR catheter and Amplatzer Duct Occluder II additional size (ADO II AS, 04-04, 05-06, 05-02) under echocardiogram and fluoroscopy. Successful device placement was achieved in 3 cases (100%). There were minor complications such as nonsignificant obstruction of left pulmonary artery and descending aorta, short period of platelet consumption in very low birth weight case.

Conclusions:

Transcatheter closure of PDA in low birth weight infant remains challenging. We will develop technical skill to another choice for treatment of preterm PDA in our country.

Patent ductus arteriosus closure in adult

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Almost of the adult patients with patent ductus arteriosus (PDA) can be technically closed with device if clinically indicated. The indications to close are not difference from pediatric patients. Left ventricle volume overload, infective endocarditis prevention regardless of shunt flow if continuous murmur is detected are indicated to close the PDA. In patients with pulmonary hypertension, closure of PDA depend on the pulmonary resistant and shunt flow. If we considered that the shunt flow still high and closure of defect can prevent the progression of pulmonary hypertension, then this defect should be closed. Pulmonary vasodilatation agents may be needed to improve the symptom and pulmonary resistant. Another problem of closure PDA in adult patient is incomplete closure of defect due to ductal calcification causing intravascular hemolysis. Interventionist should not oversize the device and closely observe sign of hemolysis. Adjunctive surgical ligation is needed in case of severe hemolysis.

PDA: Common but always challenging from infants to adults

Piya Samankatiwat, MD
Division of Thoracic Surgery, Department of Surgery, Faculty of Medicine, Ramathibodi Hospital, Bangkok, Thailand

Persistent ductus arteriosus (PDA) is one of the commonest congenital heart diseases. It is one of surgically correc:ble condi:ons that was ini:ally reported as the first successful surgical correc:on by Robert E Gross of Boston in 1938. AGerwards opera:ve treatment for PDA has been widely accepted as the standard of care.

Goal of treatment of the PDA is simply to eliminate the shunt before the development of irreversible pulmonary hypertension, so called Eisenmenger syndrome. Hence, the closure strategy must be applied as early as possible when it is indicated. Timing of interven:on is dependent predominantly upon haemodynamic effects of the defect, symptoms and systemic sequelae.

During neonatal period, there are different strategies in the management of PDA between preterm and term newborn. On one hand, PDA in premature baby is ini:ally aOempted to close using either indomethacin or ibuprofen and followed by surgical liga:on if the previous aOempt is unsuccessful. Surgical liga:on of the PDA in preterm low-birth-weight baby has been the longstanding treatment of choice un:l recently there are several reports on the successful transcatheter device closure of the PDA in this group of pa:ents. Those in term neonate and young children, on the other hand, are managed directly to either surgical or transcatheter interven:on if the ductus is large, haemodynamically significant or contribu:ng to conges:ve heart failure.

In adolescents and adults, the presence of PDA is not a straight forward situa:on that needs careful inves:ga:on and evalua:on to determine whether or not the defect can be closed. The most important factors include pulmonary vascular resistance and Qp/Qs ra:o. Some percentage of longstanding PDA is also calcified that, in turn, makes surgical closure of the ductus event more dangerous. Therefore, interven:onal approach is the more appropriate op:on.

Summarily, PDA is very common but not a simple condi:on, especially in those pa:ent in older age group. Cardiac catheterisa:on remains the inves:ga:on of choice for evalua:on of pulmonary vascular resistance and measurement of pulmonary arterial pressure. Selec:on of appropriate approach for a par:cular group of pa:ent is a crucial part of successful outcome.

16:15-17:15
@ Room C; Ballroom 1
Health Care Professional/Pharmacist/Pharmacotherapy

Cardiovascular pharmacotherapy in special population Morbidly Obese:

Krittin Bunditanukul, Pharm.D, FAC., BCPS.
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The prevalence of obesity has dramatically increased in recent years and now includes a significant proportion of the world's population. Obesity is linked to a number of co-morbidities, including diabetes, hypertension, cardiovascular disease, respiratory failure, cancer, and nonalcoholic fatty liver disease, and myriad other health problems. While many agents are available to treat these conditions, the current knowledge regarding their disposition in the obese remains limited. The physiological properties of this population differ from those of the nonobese population, including changes in regional blood flow and increases in cardiac output, fat mass, and lean mass. These pathophysiological changes can lead to alterations in the pharmacokinetics and pharmacodynamics of drug products that, in turn, call for potential dosage regimen adjustments. Many physiological alterations associated with obesity have been described in the literature, yet the impact of these alterations on specific drug pharmacokinetics and pharmacodynamics has not been clearly summarized. Numerous publications have described obesity-related alterations in all aspects of drug pharmacokinetics but these was stated to be inconclusive and inconsistent. Premarketing drug studies rarely address obese patients proportionately with patients of a normal body mass index, thus specific dosing recommendations for these patients are often absent in drug product labels. The aim of this topic is to summarize the current knowledge on obesity-related changes in pharmacokinetics and pharmacodynamics, which can ultimately have an impact on the use of drug therapy. Moreover, this topic will present some growing body of information regarding cardiovascular medications that have been studied in this population.

Cardio-Oncology: Past, Present and Future

Lakkana Suwannoi, BPharm, PharmD, BCPS, BCOP
Clinical Pharmacy Division, Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand

In the last two decades, there is an undoubted advancement in cancer therapy so that it is not unpredictable in tremendous growth in the number of cancer survivors. It is estimated that by year 2020, there will be roughly 25 million cancer survivors worldwide. These numbers again reflects an immense success of anticancer therapies. Despite the pride of cancer care improvement, this population have a unique challenge in medical issue that must be addressed. The pertinent cardiovascular complications have become a feared consequence as heart disease in cancer patients is one of the leading causes of death and still continues to increase.

Generally, there are at least 3 patient subtypes affected by the treatment for cancer for whom cardiac evaluation and management may be required: 1) patients with preexisting clinical or subclinical structural heart disease who may be at risk for developing complications with treatment, 2) patients who develop cardiac complications during chemotherapy or radiation therapy, and 3) long-term survivors of cancer who have cardiovascular abnormalities as a result of previous treatment modalities. Although the traditional anticancer drugs especially anthracyclines have shown cardiovascular consequences, the newly targeted therapies are also joining the ranks of cardiotoxicity. The related toxicity may include but not limited to cardiomyopathy, vascular toxicities and arrhythmias. Therefore, it is important to learn and equip the skills to assess, recognize, monitor, and implement cardiovascular care of patients with cancer to help minimize and prevent future cardiac problems and eventually improve overall quality of life.

Cardiovascular pharmacotherapy in special population: Cardio-Nephrology

Sayamon Sukkha, PharmD
Clinical Pharmacy Division, Department of Pharmacy, Faculty of Pharmacy, Mahidol University, Bangkok, Thailand

Cardiovascular disease (CVD) is one of the most common complications in patients with chronic kidney disease (CKD). Many studies showed that the rate of cardiovascular (CV) events have increased in relation to a decreased in kidney function. Patients with end stage renal disease (ESRD) undergoing hemodialysis is approximately ten times higher in cardiovascular mortality compared to general population. Both CVD and CKD share traditional risk factors such as hypertension, diabetes mellitus, smoking, and obesity. All CKD patients; therefore, should be performed CVD management
in standard practice.

Drugs commonly used for CVD management are intrinsically complex in CKD patients. Most CKD patients have difficulties to control blood pressure resulting in a need of anti-hypertensive combination. Pharmacokinetic alteration in kidney disease leads to dosage adjustment according to glomerular filtration rate. Dialyzable property is one of the concerns in dialysis patients to control blood pressure during intra-dialytic procedure. In addition, patient conditions can affect pharmacodynamics response in CKD patients such as non-dipping phenomenon or diuretic resistance.

Lipid abnormality is a recognizable risk factor for CVD. Although many studies regarding the benefit of statins excluded CKD and ESRD patients, the current guideline still has recommended statins in some specific CKD staging. As hypertriglyceridemia has been frequently observed in CKD patients, fibric acid derivatives have an essential role for treatment in this specific abnormality. It is certain that many lipid lowering agents have to be adjusted the dose based on renal function and practitioners should carefully select the appropriate dose to each patient.

Optimal cardiovascular risk reduction should be determined as gold standard in all CKD patients. Pharmacokinetic alteration, dialysis procedure or evidenced-studies in CKD are concerning factors to help optimize both kidney and heart function as well as patient outcome.

Young Investigator Award

24 March 2017
Time: 16:15-17:15
Venue: @ Room A; Chanderia 1

Moderator: *Rungroj Krittayaphong, MD, FACC, FESC, FAsCC*

Judges:
Isham Jaafar, MD, FAsCC (Brunei Cardiac Society)
Hav Ratneary, MD (Cambodian Heart Association)
Ario Soeryo Kuncoro, MD, FAsCC (Indonesian Heart Association)
Vang Chu, MD, FAsCC (Lao Cardiac Society)
Wan Azman Wan Ahmad, MD, FAsCC (National Heart Association of Malaysia)
Khin Maung Lwin, MD, FAsCC (Myanmar Cardiac Society)
Raul Lapitan, MD, FAsCC (Philippine Heart Assocaition)
Ong Hean Yee, MD, FAsCC (Singapore Cardiac Society)
Taworn Suithichaiyakul, MD, FAsCC (The Heart Association of Thailand)
Gia Khai, MD, FAsCC (Vietnam National Heat Association)

(YIA 01)
16:15-16:27 **The Benefit of Complete Revascularization in Left Main Percutaneous Coronary Intervention**
Krit Leemasawat, MD
Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

(YIA 02)
16:27-16:39 **The Prognostic Value of Aortic Stiffness beyond Myocardial Ischemia Assessed By Cardiac Magnetic Resonance Imaging in Patients with Suspected Ischemic Heart Disease**
Yodying Kaolawanich, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

(YIA 03)
16:39-16:51 **Effect of Thai military training in structural and functional cardiac adaptations**
Sarawuth Limprasert, MD
Cardiovascular Division, Department of Internal Medicine Phramongkutklao Hospital, Bangkok, Thailang

(YIA 01)

The benefit of complete revascularization in left main percutaneous coronary intervention

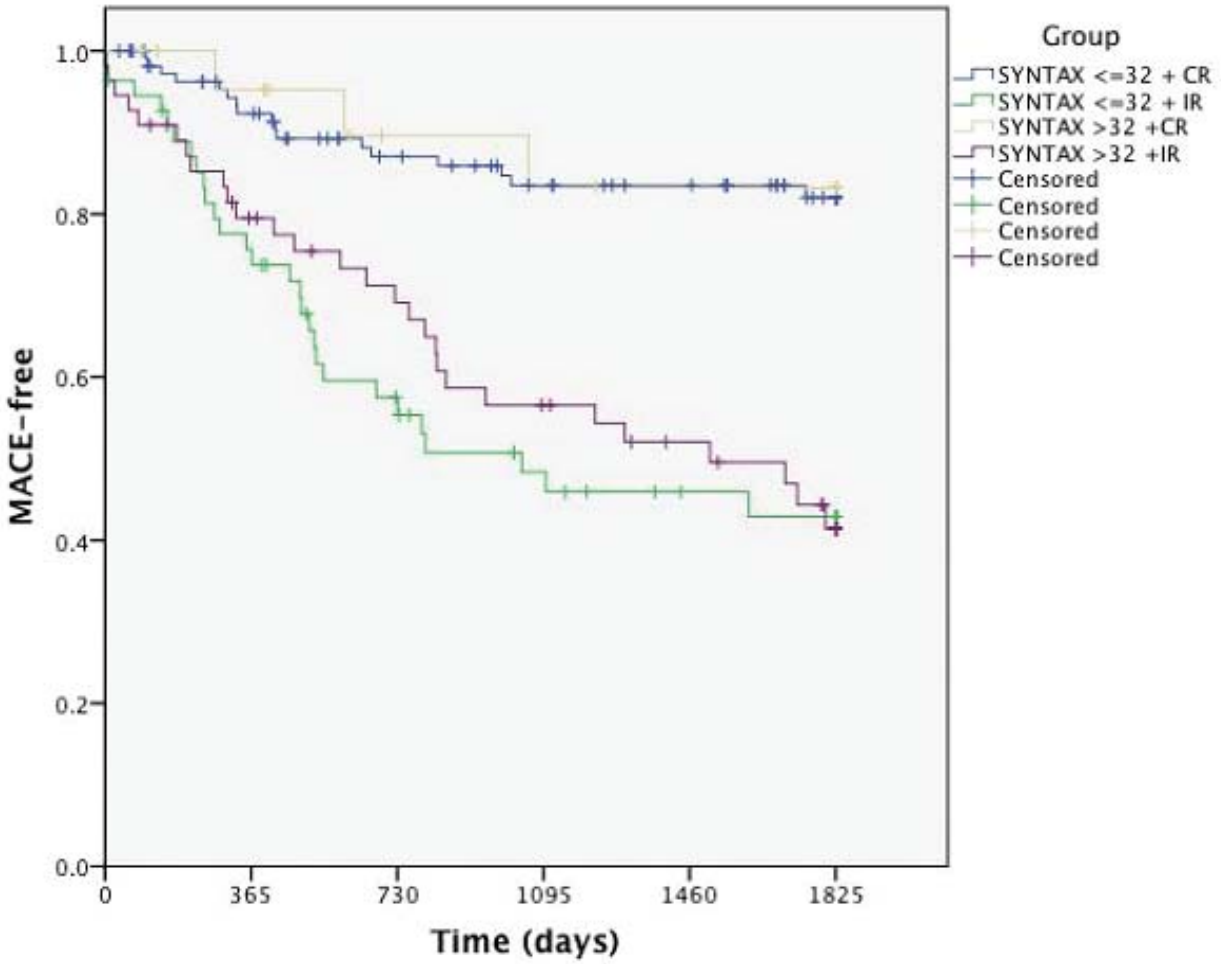
Krit Leemasawat, MD1, Terashima M, MD2, Kinoshita Y, MD2 and Suzuki T, MD2
1Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand
2Toyohashi Heart Center, Toyohashi, Aichi, Japan

Background: Completeness of revascularization determines the favorable outcomes in patients undergoing percutaneous coronary intervention (PCI). However, the current guideline recommendations for revascularization of left main disease rely on SYNTAX score.

Purpose: We aimed to test the hypothesis that complete revascularization (CR) is associated with better long-term outcomes in patients undergoing left main PCI, regardless of SYNTAX score.

Methods: We retrospectively screened for patients with de novo unprotected left main disease (≥ 50% diameter stenosis) who underwent left main PCI in Toyohashi Heart Center between the years 2005 and 2012. Patients with ST-segment elevation myocardial infarction within 1 month before left main PCI, severe disability or end-stage diseases were excluded. CR was declared if all stenotic vessels greater than 70% diameter were revascularized and all ischemic myocardial territories were reperfused.

Results: Two hundred forty five patients were eligible. The mean age of patients was 69.7 ±10.3 years. The ratio of men to women was about 4:1. One third of patients had diabetes, and 10% required dialysis. Most of patients (71.4%) had multivessel disease and most of left main lesions (71.8%) involved the bifurcation. The mean SYNTAX score was 28.6 ±11.0 (167 cases with SYNTAX score ≤32 and 78 cases with SYNTAX score >32). Use of intravascular ultrasound was the default. The left main PCI operations were unsuccessful in 2 cases (SYNTAX score: 30 and 57). Drug-eluting stent, bare-metal stent and no stent (after directional coronary atherectomy or rotational atherectomy) were used in 84.8%, 7.4% and 7.0%, respectively. Half of patients (55.1%) could be completely revascularized. Patients with SYNTAX score ≤32 had a higher rate of CR (67.1%), comparing to patients with SYNTAX score >32 (29.5%)(RR 2.27, 95%CI 1.59-3.26; P<0.01). At 5 years, major adverse cardiac events (MACE: a composite of death from any cause, myocardial infarction and ischemic-driven coronary revascularization) occurred in 45 patients with SYNTAX score ≤32 (26.9%) and 31 patients with SYNTAX score >32 (39.7%)(HR 0.66, 95%CI 0.42-1.04; P=0.07). Among patients with SYNTAX score ≤32, patients with CR had a lower MACE rate than patients with incomplete revascularization (15.2% versus 50.9%; HR 0.24, 95%CI 0.23-0.44; P<0.01). In patients with SYNTAX score >32, patients with CR also had a lower MACE rate (13.0% versus 50.9%; HR 0.22, 95%CI 0.07-0.73; P<0.01).
Conclusions: Our study showed the benefit of CR, in term of long-term MACE, in left main PCI, regardless of SYNTAX score. Completeness of revascularization, not only SYNTAX score, should be used in the decision-making process regarding the choice of revascularization.


Group
SYNTAX <=32 + CR
SYNTAX <=32 + IR
SYNTAX >32 +CR
SYNTAX >32 +IR
Censored
Censored
Censored
Censored
MACE-free
1.0
0.8
0.6
0.4
0.2
0.0
0
365
730
1095
1460
1825
Time (days)

(YIA 02)

The prognostic value of aortic stiffness beyond myocardial ischemia assessed by cardiac magnetic resonance imaging in patients with suspected ischemic heart disease

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Background and Objective: Aortic stiffness is an independent risk factor for cardiovascular (CV) events and mortality. However, there are few studies about the predictive role of aortic stiffness. The aim of this study is to investigate the association between aortic pulse wave velocity (aPWV) using cardiac magnetic resonance imaging (CMR) and future CV events in patients with suspected ischemic heart disease.

Material and Method: A total of 520 patients (mean age 68.9 ± 10.6 years) who underwent adenosine stress CMR were consecutively enrolled. Using CMR, aortic stiffness was measured as aPWV by distance propagation divided by time delay between mid-ascending and mid-descending aorta. Adenosine stress CMR was evaluated as positive or negative. Divided patients into 4 groups: higher or lower aPWV and positive or negative adenosine stress CMR. The impact of aPWV and adenosine stress CMR on newly developed CV events was evaluated.

Results: Median follow up time was 46.5 months. Median aPWV was 10.54 ± 7.98 m/sec. Adenosine stress CMR was positive in 199 patients (38.3%). The group of higher aPWV with positive adenosine stress CMR was associated with the highest CV events (Hazards ratio [HR] 8.94, 95% confidence interval [CI] 4.95 to 16.14, $p < 0.001$) and the group of higher aPWV with negative adenosine stress CMR was also associated with new CV events (HR 2.19, 95% CI 1.13 to 4.23, $p = 0.02$). Moreover, compared with the group of lower aPWV with positive adenosine stress CMR, the group of higher aPWV with negative adenosine stress CMR had the same event rates for all outcomes (HR 0.60, 95% CI 0.34 to 1.04, $p = 0.7$).

Conclusion: Aortic stiffness assessed by CMR predicted newly CV events independently and add-on benefits of adenosine stress CMR in aspects of mortality, acute coronary syndrome (ACS), new or decompensated heart failure (HF), coronary revascularization and stroke.

Table1. Baseline characteristic and MRI parameters of all patients
Group 1: Lower aPWV and negative adenosine stress CMR
Group 2: Lower aPWV and positive adenosine stress CMR
Group 3: Higher aPWV and negative adenosine stress CMR
Group 4: Higher aPWV and positive adenosine stress CMR

	Group 1 (n = 169)	Group 2 (n = 91)	Group 3 (n = 152)	Group 4 (n = 108)	Total (n= 520)	p-value
Age, year (mean ± SD)	64.6 ± 11.7	67.2 ± 9.9	73.1 ± 8.6	70.9 ± 9.3	68.9 ± 10.6	<0.001
Female, %	53.8	33	61.2	43.5	50.2	<0.001
Body mass index, kg/m2	26.9 ± 4.6	27.1 ± 4.6	26.9 ± 4.5	25.4 ± 3.6	26.7 ± 4.4	0.01
Previous history, %						
Hypertension	79.3	83.5	93.4	88.9	86.2	0.002
Diabetes mellitus	44.4	52.7	67.8	60.2	56	<0.001
Dyslipidemia	67.5	78	75	74.1	72.9	0.25
Known ischemic heart disease	7.1	31.9	15.8	39.8	20.8	<0.001
Stroke	4.1	4.4	3.3	5.6	4.2	0.83
Smoking	8.3	29.7	4.6	18.5	13.1	<0.001
Medical treatment, %						
Aspirin	39.6	60.4	43.4	64.8	49.6	<0.001
Beta blockers	44.4	52.7	51.3	51.9	49.4	0.46
Calcium channel blockers	29.6	28.6	36.2	30.6	31.5	0.53
ACEI or ARB	36.7	44	50.7	52.8	45.4	0.03
Statin	49.1	53.8	52.6	68.5	55	0.01
Parameter, (mean ± SD)						
Systolic blood pressure, mmHg	131.8 ± 18.4	132.3 ± 18	139.5 ± 19.2	144.6 ± 21.5	136.8 ± 19.9	<0.001
Diastolic blood pressure, mmHg	74.4 ± 10.9	72.1 ± 12.4	72.1 ± 12.6	72.6 ± 12.6	72.9 ± 12	0.282
Pulse pressure, mmHg	57.3 ± 15.6	60.2 ± 16.2	67.5 ± 17.2	71.7 ± 20.7	63.8 ± 18.2	<0.001
Heart rate, bpm	76.9 ± 13.4	75.2 ± 12.4	77.5 ± 14.8	77.5 ± 13.8	76.9 ± 13.7	0.54
LVEF, %	68.2 ± 12.5	61.1 ± 16.2	72.9 ± 9.5	60.6 ± 18.1	66.7 ± 14.7	<0.001
aPWV, m/sec	7.71 ± 1.55	8.23 ± 1.57	17.27 ± 9.20	16.11 ± 9.30	10.54 ± 7.98	N/A

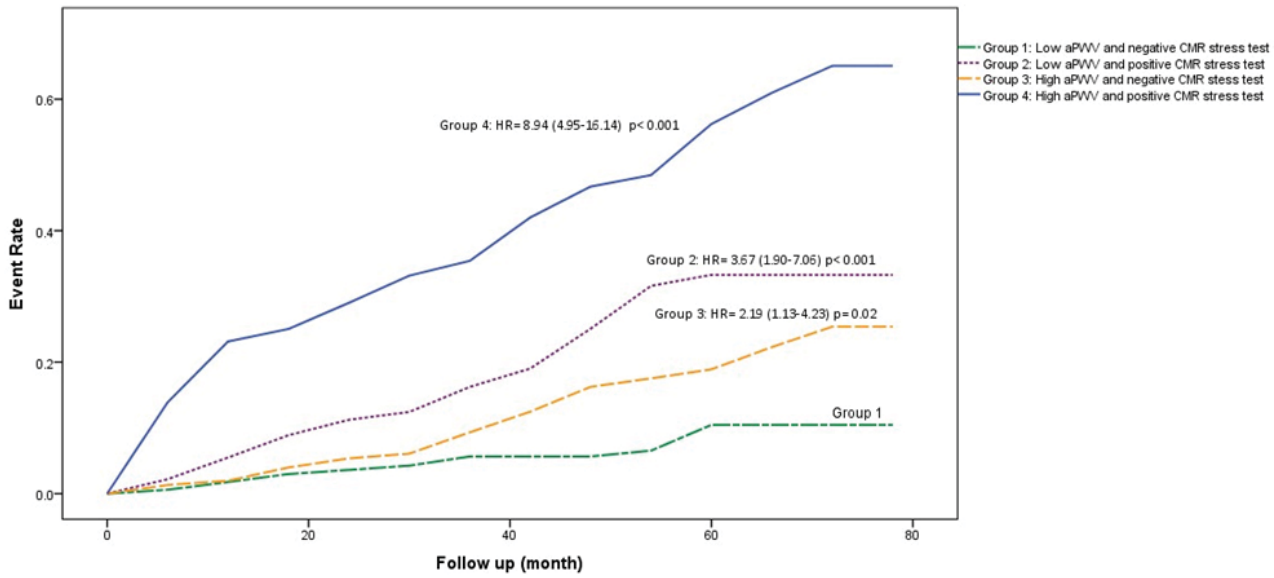
ACEI: Angiotensin-converting enzyme inhibitors ARB: Angiotensin-receptor blockers LVEF: Left ventricular ejection fraction N/A: Not availabl %: percent mmHg: millimeters of mercury bpm: beats per minute m/sec: meters per second kg/m2: kilograms per square meter

Table 2. Cardiovascular outcomes of all patients

	Group 1 (n = 169)	Group 2 (n = 91)			Group 3 (n = 152)			Group 4 (n = 108)			Total (n = 520)
	Event Rate (%)	Event Rate (%)	HR (95%CI)	p-value	Event Rate (%)	HR (95%CI)	p-value	Event Rate (%)	HR (95%CI)	p – value	Event Rate (%)
Total Mortality	6 (3.6)	10 (11)	3.17 (1.15 – 8.73)	0.03	3 (2)	0.61 (0.15-2.45)	0.49	9 (8.3)	2.77 (0.99-7.79)	0.05	28 (5.4)
CV Morality	1 (0.6)	5 (5.5)	9.52 (1.11-81.48)	0.04	0	N/A	N/A	4 (3.7)	7.35 (0.82-65.79)	0.08	10 (1.9)
ACS	3 (1.8)	8 (8.8)	5.18 (1.38-19.54)	0.02	8 (5.3)	3.39 (0.89-12.78)	0.07	22 (20.4)	15.14 (4.53-50.66)	< 0.001	41 (7.9)
HF	5 (3)	12 (13.2)	4.78 (1.68-13.56)	0.003	12 (7.9)	2.95 (1.04-8.39)	0.04	25 (23.1)	9.99 (3.82-26.12)	< 0.001	54 (10.4)
Revascularization*	0	6 (6.6)	N/A	N/A	3 (2)	N/A	N/A	20 (18.5)	N/A	N/A	29 (5.6)
New Stroke	1 (0.6)	2 (2.2)	3.87 (0.35-42.64)	0.27	5 (3.3)	6.42 (0.75-55.02)	0.9	6 (5.6)	11.94 (1.44-99.32)	0.02	14 (2.7)
Combined Endpoints	14 (8.3)	25 (27.5)	3.67 (1.90-7.06)	< 0.001	24 (15.8)	2.19 (1.13-4.23)	0.02	53 (49.1)	8.94 (4.95-16.14)	< 0.001	116 (22.3)

*Revascularization rates in each group were not enough for accurate hazard ratio (HR) calculation
%: percent CV: Cardiovascular ACS: Acute coronary syndrome HF: New or decompensated heart failure
N/A: Not available

Figure 1. Kaplan-Meier event curves for combined entpoints



Thai Heart Journal

(YIA 03)

Effect of Thai military training in structural and functional cardiac adaptations

Sarawuth Limprasert, 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 Aramsaruwong, MD, Waraporn Tiyanon, MD
Cardiovascular Division, Department of Internal Medicine Phramongkutklao Hospital, Bangkok, Thailang

Background: Short duration strenuous training and detraining in Thai Army Conscripts may result in cardiac structural changes which can be assessed by echocardiography.

Objective: To assess echocardiographic changes in strenuous training and detraining in Thai Army Conscripts.

Methods: Newly recruited volunteer Thai Army Conscripts who did not have any cardiovascular disease or risk factors were scheduled to have an echocardiographic assessment before training, 3 months after training and detraining.

Results: Mean age of the volunteers was 21.23±0.09 years old. Body mass index was significantly decreased approximately from 25 to 23 kg after 3 months of training (-1.34±0.38 kg/m2, p-value = 0.001). Diastolic blood pressure was significantly increased after 3 of training and persisted after 3 months of detraining (5.16±2.02 mmHg, p-value = 0.013 and 3.69±1.69 mmHg, p-value = 0.038). Resting heart rate was significantly decreased after 3 months of training (-8.3±1.99 beats per minutes, p-value <0.001). Echocardiographic findings included left atrium volume index, right atrium volume index, tricuspid annular plane systolic excursion and mitral E/A ratio were significantly increased after 3 months of training (2.4±0.96 ml/m2, p-value = 0.015, 1.09±0.37 ml/m2, p-value = 0.004, 1.3±0.06 mm, p-value = 0.042 and 0.6±0.08, p-value <0.001 respectively). There were increased in both global longitudinal and circumferential strain (2.03±0.48, p-value <0.001 and 1.30±0.61, p-value = 0.039 respectively) after 3 months of training but return to baseline after 3 month of detraining. There were no significant changes in left ventricular mass and left ventricular ejection fraction after 3 months of training and detraining.

Conclusion: Short duration strenuous training in Thai Army Conscripts may improve the cardiac function and return to baseline after detraining.

Keyword: Echocardiography, Training and detraining, Thai Army Conscripts

Free Paper

25 March 2017
Time: 09:30-10:30
Venue: @ Room B; Chanderia 2

Moderators: *Rungroj Krittayaphong, MD, FACC, FESC, FAsCC*
Nakarin Sansanayudh, MD

(FP 01)
09:30-09:40 **Prevalence of chronic kidney disease associated with cardiac and vascular complications in hypertensive patients: A multicenter, Nation-wide study in Thailand**
Rungroj Krittayaphong, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

(FP 02)
09:40-09:50 **Electromagnetic interference and automobile remote keyless entry in cardiovascular implantable electronic device(CIED) patients**
Narawudt Prasertwitayakij, MD
Cardiovascular division, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

(FP 03)
09:50-10:00 **Clinical and echocardiographic predictors of pulmonary hypertension in patients with mitral valve disease**
Nithima Ratanasit, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

(FP 04)
10:00-10:10 **Impact of charlson comorbidity index on long-term outcomes in patients with ST elevation acute coronary syndrome undergoing primary percutaneous coronary intervention**
Songsak Kiatchoosakun, MD
Division of Cardiology, Department of Medicine, Faculty of Medicine and Queen Sirikit Heart Center of the Northeast, Khon Kaen University, Khon Kaen, Thailand

(FP 01)

Prevalence of chronic kidney disease associated with cardiac and vascular complications in hypertensive patients: A multicenter, Nation-wide study in Thailand

Rungroj Krittayaphong1, MD, Ram Rangsin2, MD MPH DrPH, Bandit Thinkhamrop3, PhD (statistics), Cameron Hurst4, PhD, Suthee Rattanamongkolgul5, MD MPH PhD, Nintita Sripaiboonkij6, MPH (Biostatistics), Wipaporn Wangworatrakul1, MNS (Nursing)
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6Cancer Registry Unit, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Background: Hypertension and chronic kidney disease (CKD) are common conditions and both are major risk factors for cardiovascular events. The objectives were 1) to study the prevalence of CKD in hypertensive patients and 2) to study the association of CKD with cardiac and vascular complications in a multicenter, nation-wide fashion.

Methods: This cross-sectional study evaluated patients aged 20 years or older who were diagnosed with hypertension and who had been treated for at least 12 months at 831 public hospitals in Thailand during the 2012 study period. Outcome measurements included calculated glomerular filtration rate (GFR) and cardiac and vascular complications that included coronary artery disease, stroke, peripheral arterial disease, heart failure, and atrial fibrillation. Multivariable modeling was conducted to determine independent factors associated with increased risk of cardiac and vascular complications.

Results: A total of 28770 patients were enrolled. Average age was 62.8 years and 37% were male. Prevalence of CKD stage 3 and 4-5 was 33.2% and 4.3%, respectively. Prevalence of cardiac and vascular complications was 10.5% (5% having coronary artery disease, 3.9% stroke, 1.7% heart failure, and 1.2% atrial fibrillation). CKD was an independent risk factor associated with each of the complications and overall cardiac and vascular complications with an adjusted Odds ratio of 1.4 for CKD stage 3 and 1.9 for CKD stage 4-5.

Conclusion: Prevalence of CKD stage 3-5 in hypertensive population was 37.5%. CKD is an independent risk factor for adverse cardiac and vascular outcome.

(FP 02)

Electromagnetic interference and automobile remote keyless entry in cardiovascular implantable electronic device (CIED) patients

Narawudt Prasertwitayakij, MD, Wanwarang Wongcharoen, MD, Siriluck Gunaparn, MD, Praphaphan Daoram, MD, Arintaya Phrommintikul, MD
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Background: Permanent cardiac pacemaker and implantable defibrillators, so called Cardiovascular Implantable Electronic Devices(CIEDs), are now widely utilized in cardiovascular patient. And not only for rhythm disturbance but also in heart failure group as well. Incorporated with specifically designation for rhythm detection and provisional treatment, therefore meddling in with electromagnetic source is obligatory. Novel electronic device is daily bringing in, which considerable amount of these devices can be controlled via at least one wireless means. Radiofrequency Identification system, or RFID, is among commonly and widely used tool for tracking and gain control of those wireless electronic devices. Operating frequency of currently available RFID system is ranging from as low as 13 kHz to above 2.4 GHz. Detecting bandwidth in CIEDs are between 0.1 Hz to 1kHz, so any electronic devices carry lower frequency band RFID system (less than 1 GHz), are potentially at risk of electromagnetic interferrence(EMI). Most of supporting evidence, of RFID interference with CIEDs, based on in vitro trial using old model devices, hence only minimal clinical trials have been published to date. One report from device company specifically suggested patient implanted with their device to refrain from using the keyless entry system in car.

Methods: All eligible patients implanted with permanent pacemakers, automatic cardioverter defibrillators, cardiac resynchronization therapy devices were enrolled. Performing "locking" and "unlocking" of two different automobiles, Nissan X-trial(SUV) and Mazda 2(sedan), with factory installed with keyless entry system. At least 8 times with different door or tail gate, and different position of RFID tag or key fob position. Along side with regular detection for Atrial Tachycardia Rate or Ventricular Tachyarrhythmia detection schemes of implanted device, another continuously monitored with 30- seconds single lead heart rate monitor during each RFID activations. Repeated device interrogation with programmer for any EMI to be undertaken right after completion. Reactivating tachycardia therapy would be made as well. Certified clinical cardiac electrophysiologist would review stored ECG.

Results: From May 2016 to August 2016, 102 patients, age from 18 to 77 years old, with all range of CIEDs were enrolled. Both interrogated data from device or real-time monitor, reveals no incident of EMI during activating keyless entry of both automobiles, regardless position of tag or key fob.

Conclusion: Our study shows electromagnetic interference from automobile keyless entry system in all group of CIED patients. Therefore, current recommendation of EMI precaution should be revised, which would allow CIEDs to have less restriction in their daily living.

Thai Heart Journal

(FP 03)

Clinical and echocardiographic predictors of pulmonary hypertension in patients with mitral valve disease

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Background: Among valvular heart disease, mitral valve diseases (MVD), including mitral stenosis (MS) and mitral regurgitation (MR), are common. Either pressure or volume overload of left atrium (LA) leads to increased LA pressure, atrial arrhythmias, pulmonary hypertension (PH) and heart failure. PH is of clinical importance in determining symptoms, time of intervention and prognosis. The objective of the study was to identify the predictors of PH in patients with MVD.

Methods: Patients with isolated moderate to severe 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 (LV) systolic dysfunction were excluded.

Results: There were 318 patients enrolled in the study (age 54.3±15.5 years, 57.6% female). Dyspnea, atrial fibrillation and history of heart failure was reported in 242 (76.1%), 137 (43.2%) and 67 (21.1%) patients, respectively. There were 212 (66.7%) and 106 (33.3%) patients with MR and MS, respectively. Severe MVD was reported in 245 (77.0%) patients. LV ejection fraction and pulmonary artery systolic pressure were 66.6±7.2% and 47.5±18.2 mmHg, respectively. PH was reported in 119 (37.4%) of patients. LA diameter and LAV index (LAVI) was 54.2±10.5 mm and 82.3±45.1 ml/m2, respectively. In univariate analysis, dyspnea, atrial fibrillation, severe MVD, MS, LAVI, tricuspid annular plane systolic excursion, and tissue Doppler peak systolic velocity of lateral tricuspid annulus were associated with PH. In multiple logistic regression analysis, dyspnea (OR = 2.34, 95% CI: 1.20-4.55, p = 0.013), severe MVD (OR = 4.08, 95% CI: 1.92-8.70, p < 0.001), MS (OR = 1.81, 95% CI: 1.01-3.26, p = 0.047) and LAVI (OR = 1.01, 95% CI: 1.01-1.02, p < 0.001) were independent predictors of PH.

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

(FP 04)

Impact of charlson comorbidity index on long-term outcomes in patients with ST elevation acute coronary syndrome undergoing primary percutaneous coronary intervention

Songsak Kiatchoosakun, MD; Chaiyasith Wongwipaporn, MD; Burabha Pussadhamma, MD.
Division of Cardiology, Department of Medicine, Faculty of Medicine and Queen Sirikit Heart Center of the Northeast, Khon Kaen University, Khon Kaen, Thailand

Background: Chronic comorbidities are common in patients with acute coronary syndrome (ACS) and have significant impact on patient outcomes. The Charlson Comorbidity Index (CCI) may be used as a prognostic tool to quantify this impact in term of survival in ACS population

Methods: Between January 2008 and December 2011, all patients with ST elevation ACS (STE ACS) undergoing primary percutaneous coronary intervention (PPCI) were retrospectively included in this study. Baseline characteristics and angiographic data were reviewed and recorded. The study endpoint was long-term mortality. The data were locked for analysis on June 30, 2015. Cox proportional hazards model was used to examine the individual relationship between each variable and the mortality rate.

Results: Among 532 patients, 62 (11.6%) died during hospitalization. Long term follow up data were available in 459 patients. The mortality rate at 1 year, 3 year and 5 year were 21%, 27% and 34% respectively. After adjustment for baseline variables, the factors related with long term mortality were; age > 60 (HR 1.97, 95% CI: 1.08-3.58, p = 0.02), LVEF < 40 % (HR 2.63, 95% CI: 1.62-4.29, p = < 0.001), cardiogenic shock at admission (HR 2.01, 95% CI:1.19 -3.39 and CCI (HR 1.36, 95% CI 1.13-1.63, p = 0.001)

Conclusion: Age, left ventricular function, cardiogenic shock at admission and Charlson Comorbidity Index (CCI) are significant predictors of long- term mortality in unselected patients with STE ACS undergoing PPCI. CCI seems to be an appropriate prognostic indicator for long-term outcomes in STE ACS population.

Cardiology Got Challenge

25 March 2017
Time: 16:15-17:27
Venue: @ Room B; Chanderia 2

Moderator: *Kasem Rattanasumawong, MD*

Commentators: *Surapun Sitthisook, MD*
Charn Srirattanasatavorn, MD
Songsak Kiertchoosakul, MD
Adisai Buakhamsri, MD

16:15-16:27 **Case 1:** How to Get Away with Murder
Present by *Phonpitchaya Boondee, MD*
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University

16:27-16:39 **Case 2:** Wrong Turn
Present by *Suthara Aramcharoen , MD*
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University

16:39-16:51 **Case 3:** How-Help-Heart
Present by *Jiranat Poungkaew, MD*
Ratchaburi hospital

16:51-17:03 **Case 4:** where is the lesion?
Present by *Korakoth Towashiraporn, MD*
Her Majesty Cardiac CenterSiriraj Hospital, Mahidol university

17:03-17:15 **Case 5:** Catch me if you can
Present by *Sukhum Tachasakunjaroen, MD*
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University

17:15-17:27 **Case 6:** Now you see me
Present by *Titaya Sukhupanyarak, MD*
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University

Fellow Research Presentation

25 March 2017
Time: 11:15-12:15
Venue: @ Room D; Ballroom 2

Moderator: *Teerapat Yingchoncharoen, MD*
Judges: *Pyatat Tatsanavivat, MD*
Piyamitr Sritara, MD
Smonporn Boonyaratavej, MD
Nakarin Sansanayudh, MD

11:15-11:30	Research by Fellow Group 1
11:30-11:45	Research by Fellow Group 2
11:45-12:00	Research by Fellow Group 3
12:00-12:15	Research by Fellow Group 4

Research by Fellow

Group 1

Poster Presentation
Friday 24 March, 2017
Time: 17:30-19:30
Venue: @ State Room 2A+2B

Judges: *Pyatat Tatsanavivat, MD*
Krisada Sastravaha, MD
Sukit Yamwong, MD
Dilok Piyayotai, MD

RF01 **Impact of first medical contact-to-device time on one year outcomes among ST-segment elevation myocardial infarction patients undergoing primary percutaneous coronary intervention**
Suphasit Sathittrakoul, MD
Cardiology fellow, Division of cardiology,Central Chest Institute of Thailand , Nonthaburi, Thailand

RF02 **The impact of early and delayed invasive coronary angiography in patients presenting with acute coronary syndrome without ST-segment elevation**
Patipat Wutivitayarak, MD
Cardiology fellow, Division of cardiology, Central Chest Institute of Thailand, Nonthaburi, Thailand

RF03 **Evaluation the image quality of coronary artery CT angiography from 256-slice dual-source CT between low contrast dose protocol and standard contrast dose protocol at Siriraj Hospital**
Karnchana Asavatitanonta, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

RF04 **1-year outcome in patients with severe coronary artery disease who treated with percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG) in Thammasat University Hospital**
Thanyatip Boonmongkol, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Thammasat University (Rangsit Campus), Pathumtani, Thailand

RF05 **hs-Troponin levels and mortality rates after coronary artery bypass surgery in Rajavithi hospital**
Teerapong Triyalak, MD
Division of Cardiology, Department of Medicine, Rajavithi Hospital, Bangkok, Thailand

RF06 **Platelet function comparison of ticagrelor to prasugrel in acute coronary syndrome**
Thipakorn Phangmuangdee, MD
Cardiovascular Division, Department of Internal Medicine, Phramongkutklao Hospital, Bangkok, Thailand

RF07 **Prevalence of obstructive sleep apnea (OSA) in acute coronary syndrome (ACS) patients**
Chanwat Pitinan, MD
Cardiovascular Division, Department of Internal Medicine, Phramongkutklao Hospital, Bangkok, Thailand

RF08 **Independent factors that associated with false positive treadmill exercise stress test**
Viroj Muangsillapasart, MD
Cardiovascular Division, Department of Internal Medicine, Phramongkutklao Hospital, Bangkok, Thailand

RF09 **Complication related intra-aortic balloon pump counterpulsation in acute ST elevation myocardial infarction in King Chulalongkorn Memorial Hospital**
Thitima Limjaroen, MD
Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

RF10 **No-reflow phenomenon: incidence and in-hospital major adverse cardiac events in patients with acute ST elevation myocardial infarction undergoing primary percutaneous intervention**
Padoemwut Teerawongsakul, MD
Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

RF11 **Prevalence and risk factors of venous thromboembolism in acute heart failure patients (VTE-HF Study)**
Titaya Sukhupanyarak, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Thai Heart Journal

RF 01

Impact of first medical contact-to-device time on one year outcomes among ST-segment elevation myocardial infarction patients undergoing primary percutaneous coronary intervention

Suphasit Sathittrakool, MD, Boonjong Saejueng, MD, Kriengkrai Hengrussamee, MD
Department of cardiology and intervention, Central Chest Institute of Thailand, Nonthaburi, Thailand

Background: Regarding STEMI patients initially presented at non-PCI-capable hospital, the current guideline recommends to transfer them for primary percutaneous coronary intervention (PPCI) when expected FMC-to-device time less than 120 minutes. However, in real world practice, many patients had delay for treatment according to many factors.

Objective: We investigated the effects of FMC-to-device time in patients with acute STEMI who were transferred for primary PCI.

Methods: We retrospectively collected data from 177 patients with diagnosis of acute STEMI from other hospitals and transferred to Central Chest Institute of Thailand for PPCI from January 2013 to December 2014. Patients with previous cardiac arrest, previous received fibrinolytic agents and non-significant obstructive coronary lesions were excluded. Baseline characteristics, clinical and laboratory data were obtained by case record forms. FMC-to-device time were stratified into 4 quartiles (<120 minutes, 120-179 minutes, 180-359 minutes and > 360 minutes). Primary outcome was all cause mortality at one year after STEMI. Secondary outcomes were in-hospital mortality and major adverse cardiac events (MACE) at one year.

Results: Mean age of patients was 60.90 years old and 78% were male. There were 14 deaths at one year post STEMI. There were no significant relationships between FMC-to-device time, one year mortality, in hospital mortality and MACE. Patients who had primary outcome tend to had more total ischemic time but not significantly (mean 576.93 vs 423.45 minutes; p-value 0.175). Patients with total ischemic time more than 360 minutes tend to have more MACE at one year than patients with total ischemic time less than 360 minutes (OR 2.78, 95%CI 1.31-5.88; p-value 0.008). Predictors of one year mortality were low hematocrits, impaired renal function and left main disease. Predictors of in-hospital mortality and major adverse cardiac events (MACE) at one year were low mean arterial pressure, Killip class IV, low hematocrits, left main disease and IABP used.

Conclusions: FMC-to-device time in STEMI patients transferred for primary PCI does not correlate with one year mortality, in hospital mortality and MACE. However, the total ischemic time more than 360 minutes is related to MACE at one year. National policy to push the patients' awareness should be advocate to improve total ischemic time and clinical outcomes.

Keywords: First Medical Contact-to-Device time (FMC), ST-segment elevation myocardial infarction (STEMI), primary percutaneous coronary intervention (PPCI), total ischemic time, major adverse cardiac events (MACE).

RF 02

The impact of early and delayed invasive coronary angiography in patients presenting with acute coronary syndrome without ST-segment elevation

Patipat Wutivitayarak, MD, Thamarath Chantadansuwan, MD, Kriengkrai Hengrussamee, MD
Department of cardiology and intervention, Central Chest Institute of Thailand, Nonthaburi, Thailand

Background: Acute coronary syndrome without ST-segment elevation (NSTE-ACS) is one of the most common cause of death and hospitalization worldwide. Invasive coronary angiography is recommended within 24 and 72 hours in high and intermediate risk NSTE-ACS patients respectively. However, in real world practice, early CAG cannot be tied to the guideline.

Objective: We aim to compare the clinical outcomes of early (≤72 hours) and delayed (>72 hours) coronary angiography in NSTE-ACS patients in terms of one year all-cause mortality, further non-fatal myocardial infarction (MI), unplanned revascularization, heart failure and renal failure.

Method: This retrospective cohort study was enrolled NSTE-ACS patients with intermediate risk NSTE-ACS (diabetes mellitus, renal insufficiency, left ventricular ejection fraction less than 40% and rise or fall in cardiac troponin compatible with MI) who were admitted at Central chest Institute of Thailand from January 2014 to December 2014.Baseline characteristics and clinical outcomes during hospitalization and 1 year follow up were recorded and analyzed. Chi-square was used to compare the results between both groups. Univariate analysis with binary logistic regression were used. At $p \leq 0.05$ was considered to be statistically significant.

Results: Of 106 patients, the mean age was 66.3 years and 50.9% of patients were female. Prevalence of HT, DM and smoking in this study was 84.9%, 41.5% and 48.1%, respectively. The use of aspirin and new P2Y12 inhibitors (clopidogrel, prasugrel and ticagrelor) was 92.5% and 79.2%, respectively. There were no significant differences between studied patients with early and delayed coronary angiography in terms of baseline characteristics, medications, clinical presentations and left ventricular ejection fraction except regional wall motion abnormality which was found more in delayed CAG group(43% in delayed CAG group vs. 25% in early CAG group; odds ratio 3.91; 95% CI, 1.16-13.23, p= 0.028). The composite endpoints of death, non-fatal MI, further unplanned revascularization, heart failure and renal failure were significantly higher in delayed CAG group (odds ratio 4.33; 95% CI, 1.16-16.25, p= 0.03).

Conclusion: Among NSTE-ACS patients with intermediate to high risk, delayed CAG or delayed invasive strategy had resulted in worse prognosis outcomes than early CAG or early invasive strategy in terms of composite of death, further non-fatal myocardial infarction, unplanned revascularization, heart failure and renal failure.

Keywords: Early invasive coronary angiography, delayed invasive coronary angiography, acute Coronary Syndrome without ST-segment Elevation (NSTE-ACS)

RF 03

Evaluation the image quality of coronary artery CT angiography from 256-slice dual-source CT between low contrast dose protocol and standard contrast dose protocol at Siriraj Hospital

Karnchana Asavathitanonta, MD, Vithaya Chaithiraphan, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Background: Nowadays, contrast-enhanced CT is serving a role in the detection and treatment of patients with several types of heart disease. The smallest contrast dose is highly desirable in performing cardiac tomography (CT) to prevent contrast induced nephropathy (CIN).

Objective: To evaluate the image quality of coronary artery from 256-slice dual-source CT (DSCT) between low contrast dose protocol (25% contrast volume reduction) and standard dose protocol at Siriraj hospital.

Method: 114 patients who underwent single-beat (Flash) protocol coronary CT angiography at Siriraj hospital were divided into two groups. One group received a standard dose of contrast media (Ultravist 370), 1 ml/kg at a rate of 6 ml/sec. While the other group received the low dose protocol, 0.75 ml/kg at a rate of 6 ml/sec. We evaluated CT attenuation of the LM, pLAD, pLCx, pRCA, SNR, CNR, grade image contrast and grade image noise. Two cardiac imaging cardiologists independently assessed image quality of coronary arteries.

Results: There was no significant difference in mean CT attenuation of coronary artery between low contrast dose and standard dose protocol (LM 632.5 vs 575.66 P=0.48, pLAD 597.5 vs 544.88 P=0.73, pLCx 617.4 vs 540 P=0.07, RCA 610.44 vs 553.94 P= 0.061).There was no significant difference in the overall grade image contrast and grade image noise (p-value = 0.926 and p-value = 1.00, respectively)

Conclusion: For single-beat coronary CTA with DSCT, the contrast dose could be reduced to 75% of the standard dose without affecting image quality.

RF 04

1-year outcome in patients with severe coronary artery disease who treated with percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG) in Thammasat University Hospital

Thanyatip Boonmongkol, MD, Kid Bhumimuang, MD, Asst. Prof. Pisit Hutayanon, MD,
Cardiology Unit, Department of Medicine, Faculty of Medicine, Thammasat University (Rangsit Campus), Pathumtani, Thailand

Background and rationale: According to the 2014 ESC/EACTS Guidelines on myocardial revascularization recommended that patients who were diagnosed with left main coronary artery disease and/or multivessel disease were mainly treated with Coronary Artery Bypass Grafting (CABG). However, majority of these patients were elderly and had numbers of comorbidities. Consequently, the patients might refuse surgery or not be suitable for CABG. Moreover, there were limitation of resources for CABG, therefore in clinical practice most of these patients received revascularization with PCI

Objective: To study outcomes of patients with severe coronary artery disease within 1-year after Percutaneous Coronary Intervention (PCI) or Coronary Artery Bypass Grafting (CABG) in Thammasat University Hospital.

Study Methods: Retrospective data collection from medical records of patients with left main coronary artery disease and/or multivessel disease with PCI or CABG during 01 January – 31 December 2014. Patient's age, sex, and comorbidities were collected, as well as, information related to myocardial infarction, including; number of the infarcts, treatment scheme, medications, and, outcome of the treatment. Primary outcome was the composite endpoint of death, myocardial infarction, stroke, or target vessel revascularization that occurred during 1 year after treatment.

Results: In 2014, 178 patients with left main coronary artery disease and/or multivessel disease and treated with PCI or CABG, was 104 and 74, respectively. Data collection was conducted with 100 patients; 50 for PCI patients and 50 for CABG patients. The primary outcome was higher in patients proceed to PCI than CABG (PCI 22% VS 10%; hazard ratio 2.22; P = 0.12) without statistical significant. Also the secondary outcomes (death, myocardial infarction, and bleeding) were not statistical significant difference between two groups. However, data showed trend to increase cardiovascular event and bleeding in patients who proceed to PCI.

Conclusion: Among patients with left main coronary artery disease and/or multivessel disease who were treated with PCI had tended to increase cardiovascular event and bleeding than those who were treated with CABG within 1-year follow up.

RF 05

hs-Troponin levels and mortality rates after coronary artery bypass surgery in Rajavithi hospital

Teerapong Triyalak, MD.,* Tanarat Choon-ngam, MD.*, Saowaluk Prompongsa, MD.*,Sutham Sutheerapatraanont, MD.*,Napa Siriwiwattanakul, MD.*,Pariwat Pengkeaw, MD.*,Viroon Likhitlertlum, MD.*,Surapun Pongsuthana, MD*
Division of Cardiology, Department of Medicine, Rajavithi Hospital, Bangkok, Thailand

Background: Coronary artery disease is the most common heart problem. The current treatment includes medication, PCI (percutaneous coronary intervention) and coronary artery bypass graft(CABG) surgery. Coronary artery bypass graft (CABG) surgery may be associated with significant perioperative and postoperative morbidity and mortality. Many factors such as, age, DM, HT,CKD may effect the prognosis. The postoperative cardiac troponin may be a prognostic factors but the evidence is inconclusive.

Objective: To measure cardiac troponin(hs-Trop T) in patient undergoing coronary artery bypass graft for correlation with morbidity and mortality.

Methods: Cardiac hs-troponin T (hs-Trop T) were determined at 24 before and 24 hours after surgery in patients undergoing coronary artery CABG at Rajavithi hospital during June to December, 2016. Clinical data were collected including the age, sex, body weight, height, LVEF, underlying disease (hypertension, DM, dyslipidemia), number of stenotic coronary arteries, length of hospitalization, prolong intubation, need for dialysis.

Results: A total of 40 patient were enrolled. The mean age was 64.5 years old and 67.5% were male. The incidence of DM 60%, HT 95%, LVEF(>55%) 57.5%. was respectively. There were 35% with LM disease and significant LAD disease was present in 97.5%. There were 3 deaths (7.5%) and all had a significant increase hs-Trop T (4,973.2 vs 738.8; p-value = 0.0498). Patient with prolong intubation had significantly higher troponin levels (3,649.9 vs 730; p-value = 0.017).

Conclusions: In patients undergoing CABG in Rajavithi hospital, higher levels of of hs-Trop T are predictive of with higher mortality rate and prolong intubation.

Keywords: cardiac troponin-T, CABG, Mortality.

RF 06

Platelet function comparison of ticagrelor to prasugrel in acute coronary syndrome

Thipakorn Phangmuangdee, MD, Tanyarat Aramsaruwong, 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, Waraporn Tiyanon, MD

Objective: This study compared platelet function of acute coronary syndrome patients after the used of Ticagrelor VS Prasugrel.

Background: Despite the clinical benefits of Ticagrelor and Prasugrel shown in PLATO and TRITONTIMI 38. There was no significant clinical difference head to head RCT study in both medicines except PRAGUE 18 study which was under-power for statistic, low risk population used and non significant difference result. Platelet function which was surrogate endpoint that had shown relation to clinical endpoint in PLATO and PRINCIPLE TIMI 44 was used as marker to compare difference in this study.

Method: Prasugrel in comparison to Ticagrelor for inhibition of platelet function was randomized using block of four in patients undergoing cardiac catheterization. The primary endpoint was platelet function test using 20µmol/L ADP after Prasugrel 60mg loading then 10mg maintenance and Ticagrelor 180mg loading then 90mg bid at 7±5days. Secondary endpoint was bleeding complication using BARC classification.

Results: At 7±5days, the primary endpoint –platelet function assay after inhibited with 20µmol/L ADP was 26.22 ± 13.62 after prasugrel VS 19.7 ± 14.56 after ticagrelor (p=0.176), ratio of inhibition by collagen/ADP was 1.85 ± 0.88 after prasugrel VS 3.03 ± 2.44 after ticagrelor (p= 0.061), ratio of inhibition by collagen/epinephrine was 1.72 ± 1.38 in prasugrel VS 1.45 ± 0.88 in ticagrelor (p=0.494). There was only BARC 1 bleeding which was 25% in Prasugrel VS 28.6% in Ticagrelor (p=1.000).

Conclusion: In patients with acute coronary syndromes who had significant coronary lesion with coronary angiogram, Ticagrelor and Prasugrel weren't significantly different in platelet function after 7±5days. of using both antiplatelet. Overall bleeding was also not significantly different in both groups.

Thai Heart Journal

RF 07

Prevalence of obstructive sleep apnea (OSA) in acute coronary syndrome (ACS) patients

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Background: Obstructive sleep apnea syndrome (OSA), a common disorder characterised by repetitive pharyngeal collapse during sleepis increasing medical concern because of convincing data showing important cardiovascular sequelae.

Objective: To study the prevalence ofobstructive sleep apnea in acute coronary syndrome patients who admitted in cardiac ward, Phramongkutklao hospital.

Methods: Descriptive study was done in acute coronary syndrome which age more than 20 years population and were admitted inPhramongkutklao hospital.Portable monitoring sleep test was performed in hemodynamically stable patient after treatment of acute coronary syndromeas an in-hospital care, single night test,in closely monitor cardiac ward, Phramongkutklao hospital. Laboratory result and medical data was collected for evaluate associated risk factor for obstructive sleep apnea in acute coronary syndrome patients.

Results: Thirty-five patients who was diagnosed acute coronary syndrome, underwent attended portable monitoring sleep test which 20 patients was success in performing the test (57.1%). Twelvespatients(60%) was confirming diagnosis for OSA by portable monitoring. Associated risk factor were body mass index (BMI) (P value = 0.007) (25.75 vs 22.46), hypertension (P value = 0.019). Moreover, the results of Epworth Sleepiness Scale were not showed the association with the results from portable monitoring sleep test. Any complication from performing the sleep test was not recognized along the study.

Conclusion: Our study have demonstrateda high prevalence of OSA in ACS patients (65%) which further investigation, full overnight polysomnography, should be performed to confirm our finding.

Key Words: Obstructive sleep apnea,Acute coronary syndrome

RF 08

Independent factors that associated with false positive treadmill exercise stress test

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Background: Treadmill exercise stress testing (EST) is the valuable tool as a screening investigation in patients who is suspected ischemic heart disease. The objective of this study is to analyze the factors that might be associated with the false positive test.

Methods: Retrospective, case-control, study was conducted. Patients who had positive treadmill exercise stress test and underwent conventional coronary angiography (CAG) or coronary computed tomographic angiography (coronary CTA) during October 2013 to October 2016 were enrolled. True positive group and false positive group were divided according to final diagnosis from CAG or coronary CTA. Factors that might interfere with the false positive EST were analyzed.

Results: A total 172 patients were enrolled. Mean age was 62 years and 115 were male. There were 77 patients (45%) in true positive EST group and 95 patients (55%) in false positive EST group. Demographic data were not significant differences between two groups except for younger age in false positive EST group. Univariate analysis showed female gender, appropriate heart rate responsiveness, upslope ST segment depression and downslope ST segment depression which confined to the inferior leads were statistically significant differences between two groups. Multivariate analysis revealed independent predictors of false positive EST were female gender (OR 3.90, 95% CI 1.36-11.18, $p = 0.011$) and upslope ST segment depression (OR 74.03, 95% CI 7.74-707.65, $p < 0.001$).

Conclusion: Female gender and upslope ST segment depression were analyzed as independent predictors of false positive treadmill exercise stress test.

Thai Heart Journal

RF 09

Complication related intra-aortic balloon pump counterpulsation in acute ST elevation myocardial infarction in King Chulalongkorn Memorial Hospital

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Background: Intraaortic balloon counterpulsation (IABP) is commonly used and recommend for treatment of cardiogenic shock complicating ST elevation myocardial infarction (STEMI) even with uncertain benefits and potential devices related risks. The aim of this study was to review the major bleeding and vascular complications related to IABP in patients with STEMI.

Methods: We conducted a retrospective study of consecutive patients with diagnosis of STEMI who underwent primary PCI at a tertiary care hospital in Thailand from January 2010 to December 2015. Patient characteristics, treatments, IABP used, complications and outcomes were obtained. All patients were expected to undergo early revascularization and to receive the best medical therapy. T-test, Chi-square and Multivariate analysis were used to analyze.

Result: Total 650 patients (mean age of 60.19 ± 13.8 and 73.2% male), 138 patients in the IABP group and 512 patients in the non IABP group were included. The major bleeding and vascular complications were developed in 47 patients in the IABP group (34.1%) and 39 patients in the control group (7.6%) (odd ratio 6.26; 95% confidence interval, 3.76 - 10.24;$p < 0.001$). Multivariate analysis demonstrated that only female, history of stroke), cardiogenic shock and serum creatinine were independent predictors of complications, ($p < 0.05$ for all). Nevertheless, IABP used was not associated with major bleeding and vascular complications.

Conclusion: In this single center experiences, IABP is still commonly used in patient with STEMI. The bleeding and vascular complications are common in patient with IABP but IABP is not an independent factor of complications.

RF 10

No-reflow phenomenon: incidence and in-hospital major adverse cardiac events in patients with acute ST elevation myocardial infarction undergoing primary percutaneous intervention

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Objective: The purpose of this study was to determine incidence and in-hospital major adverse cardiac events (MACE) of no reflow phenomenon (NRP) in patients with acute ST elevation myocardial infarction undergoing primary percutaneous intervention (PCI).

Background: No-reflow phenomenon during primary percutaneous intervention is associated with worse in-hospital and late clinical outcome.

Method: A total of 180 consecutive patients who underwent primary percutaneous intervention for acute ST elevation myocardial infarction at King Chulalongkorn Memorial Hospital were analyzed frame-by-frame coronary angiography to assess for NRP. The in-hospital MACE component with fetal arrhythmia, cardiogenic shock, re-infarction and death were analyzed. The predictors for NRP were assessed using univariable analyses and multivariable model.

Results: The overall of no-reflow phenomenon was found in 18 (10%) of 180 patients. Patients with NRP had significantly higher in-hospital rate of composite MACE including fatal arrhythmia, cardiogenic shock, re-infarction and death (44.4% vs 16.7%, p = 0.005) and 30-day mortality (16.7% vs 7.5%, p = 0.181). Univariate predictors for NPR were pain to balloon > 12 hours (odds ratio [OR]: 6.280, confidence interval [CI]: 1.37 to 28.9, p = 0.018), 1st plasma glucose > 200 mg/dl (OR: 5.298, CI: 1.91 to 14.69, p = 0.001), CPR before PCI (OR: 4.34, CI: 1.21 to 15.66, p = 0.025) and Killip class IV (OR: 1.617, CI: 1.16 to 2.26, p = 0.005). In multivariable models, 1st plasma glucose > 200 mg/dl was strongest predictor observed for NRP (OR: 5.05, CI: 1.66 to 15.30, p = 0.004)

Conclusion: The occurrence of no reflow phenomenon is not infrequent but associated with in-hospital and late subsequent adverse events.

Thai Heart Journal

RF 11

Prevalence and Risk factors of Venous Thromboembolism in Acute Heart Failure Patients (VTE-HF Study)

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Background: Venous thromboembolism is one of the consequences of heart failure and also impacts mortality and quality of life. However, the previous studies of VTE in heart failure in Thailand were small and the data was limited.

Objective: To evaluate the prevalence of VTE and risk factors in acute heart failure patients in Thailand.

Method: The prospective cohort study was conducted from December 2015 to July 2016 in Ramathibodi hospital, Mahidol university, Thailand. The patients who were hospitalized due to acute heart failure were enrolled and screened for deep vein thrombosis (DVT) by Doppler ultrasonography beyond 5 days and computed tomography angiography (CTA) if clinical suspected pulmonary embolism. Multiple logistic regression was performed to identify risk factors of VTE.

Results: 80 patients were enrolled in the study, 41 were male (51.3%), median age was 73 years old, median BMI was 22.4 kg/m2, primary etiology of heart failure were ischemic (37.5%) and hypertensive cardiomyopathy (25%), median NT pro-BNP was 6637 pg/mL, median D-dimer was 1139 ng/mL, median EF was 50 %. Among 80 patients, 36 patients (45%) had history of prior heart failure, 4 patients (5%) had history of prior VTE and 7 patients (8.8%) had history of cancer. The prevalence of VTE was 10% (8 patients). Multiple logistic regression showed history of prior VTE as an independent risk of VTE in our population (OR 71.795 (95% CI 4.161-1238.679, P value 0.003).

Conclusion: In Thailand, the prevalence of VTE in hospitalized heart failure patients is 10%. The history of prior VTE increases risk factor of VTE in hospitalized heart failure.

Keywords: Venous thromboembolism, prevalence, Heart failure

Table: multivariable analysis

Patient characteristics	Odd ratio	95% CI	P-value
History of cardiovascular condition: Venous thromboembolism	71.795	4.161-1238.679	0.003
History of non cardiovascular condition: anemia	5.579	0.850-36.634	0.073
ICU admission	6.567	0.645-66.819	0.112

Research by Fellow

Group 2

Poster Presentation
Friday 24 March, 2017
Time: 17:30-19:30
Venue: @ State Room 2A+2B

Judges: *Kriengkrai Hengrussamee, MD*
Smonporn Boonyarattavej Songmuang, MD
Rungroj Krittayaphong, MD
Kasem Rattanasumawong, MD

RF12 **The association between characteristic of bradyarrhythmia and coronary artery disease**
Suthara Aramcharoen, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

RF13 **Memory T wave after catheter ablation in patients with wolff-parkinson-white syndrome**
Phonpitchaya Boondee, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

RF 14 **Antithrombotic management and device related bleeding complications in patients undergoing cardiovascular implantable electronic devices, a single center study**
Nithit Tianchetsada, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

RF15 **Predictors for permanent pacemaker implantation in post cardiac valve surgery**
Supakit Kunoopakarn, MD
Division of Cardiology, Department of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

RF16 **Effect of pendulum exercise on shoulder function after cardiac device implantation**
Warisara Petvipusit, MD
Division of Cardiology, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

RF17 **Differentiating atrioventricular nodal reentrant tachycardia from orthodromic atrioventricular reciprocating tachycardia using combination conventional criterias is more accurate**
Natchayathip Kittichamroen, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Thammasat University (Rangsit Campus), Pathumtani, Thailand

RF18 **The prevalence of atrial fibrillation in stroke patients with normal sinus ECG at first presentation in Bhumibol Adulyadej Hospital**

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RF19 **ST segment value of lead V2-V3 in asymptomatic patient**

Jingjo Saisaard, MD
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RF20 **Effect of curcumin on matrix metalloproteinase - 9 level in sick sinus syndrome patients with paroxysmal atrial fibrillation who received dual chamber pacemakers: A randomized double blind placebo controlled study**

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RF21 **Optimal INR to prevent stroke in Thai patients with rheumatic mitral stenosis and atrial fibrillation who are receiving warfarin**

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RF 12

The association between characteristic of bradyarrhythmia and coronary artery disease

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Background: The presence of coronary artery disease in pacemaker implantation candidates is relatively frequent and is associated with increase mortality. The purpose of this study is to determine the association between characteristic of bradyarrhythmia and coronary artery disease in the patients undergoing permanent pacemaker implantation.

Objective:

1. To determine the association between the characteristic of bradyarrhythmia and coronary artery disease.
2. To demonstrate the incidence of coronary artery disease in patients with bradyarrhythmia required permanent pacemaker implantation.

Method: The retrospective cohort study was conducted on patients who were candidates for permanent pacemaker implantation and had coronary angiography done within 3 months of the pacemaker implantation at Ramathibodi hospital between 2011-2015. Patients who had myocardial infraction, recent post cardiac surgery, recent catheter ablation or incomplete medical records were excluded. EKG parameters were reviewed by experience electrophysiologists. Multivariate analysis was performed to analyze the predictors of coronary artery disease.

Results: Of 870 patients who were the candidates for permanent pacemaker implantation, 305 patients had coronary angiography performed within 3 months of the implantation, 110 patients were excluded by selection criteria. Therefore, 195 patients (36.9% male, age 76 years old) were eventually enrolled in the study. Significant coronary artery disease was found in 36.9% (N=73); 1.5% LM disease, 8.2% DVD, 8.2% TVD, and 27.2% LAD. When divided the type of bradyarrhythmia into sick sinus syndrome (SSS, N=137, 70.3%) and high grade AV block (AVB, N= 58, 29.3%), the incidence of coronary artery disease was not different between each type (37.2% in SSS Vs 36.2% in AVB, p=1.00). Multivariate analysis showed age and sex were independent risk factors of coronary artery disease (P=0.001, P<0.001, respectively).

Conclusion: In patients that candidates for permanent pacemaker implantation, the incidence of coronary artery disease is 36.9%. The age and male sex were associated with higher incidence of coronary artery disease.

Keywords: heart block, sick sinus syndrome, bradyarrhythmia, coronary artery disease

RF 13

Memory T wave after catheter ablation in patients with wolff-parkinson-white syndrome

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Background: Memory T-wave is characterized by transient T wave inversion as a result of altering abnormal sequence of ventricular activation. In Wolff-Parkinson-White (WPW) syndrome patients, the occurrence and duration of T wave abnormalities had been shown in small studies to be associated with the accessory pathway location and the degree of pre-excitation. In this study, we aim to explore the incidence, duration, and characters of memory T wave after catheter ablation of WPW patients in a larger cohort.

Method: All patients with WPW syndrome who underwent a successful catheter ablation our electrophysiology laboratory between January 2010 and January 2015 were restrospectively studied and followed for 1 year. Patients with bundle branch block, intraventricular conduction defect, or intermittent pre-excitation were excluded. Baseline characteristics and EKG parameters before and after successful catheter ablation were recorded. The location of the accessory pathway was categorized according to the 1999 consensus statement from the North American Society of Pacing and Electrophysiology.

Result: There were 86 patients enrolled in the study (54.7% male, age 41 years old). Accessory pathway was commonly located at left posterior (22.1%), followed by posteroseptum (20.9%), and right anterior (19.8%). No multiple pathways were observed in any patients. After successful catheter ablation, memory T-wave occurred in 42 patients (48.8%). T-wave memory appeared in all of the patients with AP located at right lateral, right posterior, anteroseptum, and mid-septum. On the contrary, none of the patients with AP located at left anterior, left anterolateral, left lateral and left posterior had T-wave memory.
Of all 42 patients with T-wave memory, 20 patients lost follow up. Of the 22 patients remaining, memory T-wave persisted at the median duration of 56 days (Interquartile 15.5 –165.0). Changes in QRS axis before and after ablation were more pronounced in those with memory T-wave than those without (Mean delta QRS = -69º ± 69º vs 13º ± 31, P <0.0001)

Conclusion: Memory T-wave was commonly seen after ablation of WPW and disappeared within a short period of time.

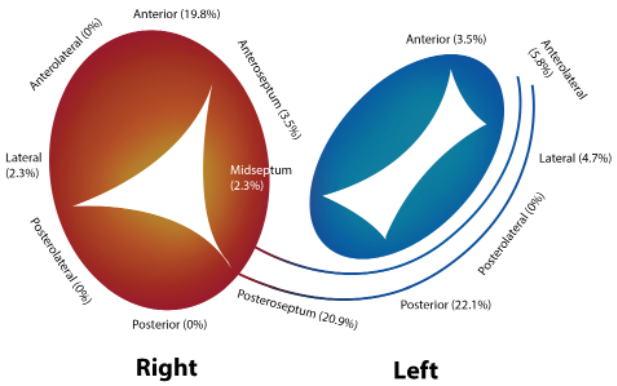

Figure1: Incidence of memory T-wave by location (N=42)

RF 14

Antithrombotic management and device related bleeding complications in patients undergoing cardiovascular implantable electronic devices, a single center study

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Background: In each year 1.65 million people around the world were implanted with cardiovascular implantable electronic devices (CIEDs), 14-35% of these patients received either oral anticoagulant (OAC) or anti-platelet. These drugs increased bleeding complications in CIEDs implantation. Currently we have no data about the device related bleeding complications (DRBCs) in Thai's patients receiving OAC and/or antiplatelet prior CIEDs implantation.

Methods: We retrospectively reviewed each consecutive patient who underwent CIEDs implantation and continue to followed up in Siriraj device clinic in the year of 2016. Each baseline characteristic, comorbidities, types of CIEDs, CIEDs indication, types of antithrombotic and DRBCs data were collected. All patients who follow up in the device clinic during 12-16 days post implantation will be evaluated for DRBCs by 2 device clinic staff as per Siriraj protocol. If the DRBCs was detected, caliper will be used to measure the size in 3 dimensions. Our primary outcome is the incidence of DRBCs in patients who received antithrombotic drugs and the incidence of DRBCs in each group of antithrombotic drug will be the secondary outcome. This study was approved by the institutional review board (IRB).

Results: There were 300 patients who underwent CIEDs implantation and continue to follow up in the device clinic since January 2016 to December 2016, mean age was 69.7 ± 14.78 years which 60.3 % were male. Type of implanted CIEDs consist of pacemaker 59.7%, AICD 28.3% and CRT 12 %. Antithrombotic used was found in 73% (218) of the implanted CIEDs patient which distributed into single antiplatelet (SAPT) group 33% (99), dual antiplatelet (DAPT) group 13% (39), OAC plus antiplatelet group 8% (24), triple therapy (DAPT plus OAC) group 1.3% (4), warfarin group 14.7% (44) and Non-Vitamin K antagonist OAC (NOAC) group 4.7% (14). The primary outcome showed incidence of DRBCs 12.8 % in all antithrombotic used patients. Among these patients, the DRBCs was detected 9.7% (9) in SAPT group, 15.4% (6) in DAPT group, 13.8% (4) in OAC plus antiplatelet group and 20.5% (9) in warfarin group. There was no DRBCs detected in no antithrombotic group (82) as well as the NOAC group (14). However, almost all of the DRBCs patients spontaneously resolved without further treatment or intervention. Unfortunately, 1 DRBCs patient who took only aspirin 81 mg was admitted for hematoma evacuation. As you might expect, different in sizes did reveal

RF 15

Predictors for permanent pacemaker implantation in post cardiac valve surgery

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Background: Atrioventricular block (AVB) is an unfavorable complication after cardiac valve surgery . This study aims to identify predictors for permanent pacemaker(PPM) implantation in patients who underwent cardiac valve surgery.

Methods: We retrospectively review all patients who underwent cardiac valve surgery (including replacement and repairment) from January 2007 to December 2015 and identify postoperative AVB within 100 days that required PPM. In order to compare the non-AVB group and AVB group, we randomly selected the non-AVB group from ICD 9 list in a ratio of 2:1 with the AVB group for data analysis. Each patient baseline characteristic, preoperative lab, echocardiographic result, operative data were collected. The primary outcome is the predictor of AVB post cardiac valve surgery which required PPM. This study was approved by the institutional review board (IRB).

Results: PPM were required in 40 patients who developed AVB after cardiac valve surgery. Among 40 patients, 47.5% (19) were single aortic valve (AV) surgery, 15% (6) were single mitral valve (MV) surgery, 10%(4) were single tricuspid valve surgery, 5% (2) were double valve surgery of AV plus MV, 17.5% (7/40) were double valve surgery of MV plus TV and 2.5% (1) was triple valve surgery of AV, MV plus TV.

Those who had redo valve surgery, previous cardiac valve surgery, combined ASD surgery, preoperative first degree AV block and known case prosthetic dysfunction all demonstrated a significant association with AVB post cardiac valve surgery that require PPM (P = 0.002, OR 15.87), (P = 0.008, OR =7.87), (P = 0.047, OR 8.33), (P = 0.01, OR 3.42) and (P 0.004, OR 3.17) respectively.

Conclusions: Redo valve surgery, previous cardiac valve surgery, combined ASD surgery and preoperative first degree AV block were a significant predictors for PPM implantation after cardiac valve surgery.

RF 16

Effect of pendulum exercise on shoulder function after cardiac device implantation

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Background: Patients post cardiac rhythm management devices (CRMDs) implantation are commonly instructed to restrict ipsilateral arm movement to reduce risk of lead dislodgement. This immobilisation practice increases risk of shoulder-related pain leading to limited shoulder function. One small study reported that ipsilateral arm exercise early after implantation was safe and reduced incidence of shoulder-related pain. We aimed to assess the effect of pendulum exercise on shoulder function in patients after CRMDs implantation.

Method: This study was prospective randomized, open blinded end point study. Thirty-four patients undergoing CRMDs implantation were randomized into standard of care and pendulum exercise groups. The shoulder function was assessed by QuickDash scores and measurement of shoulder abduction and flexion angle before and 1 month after implantation. The interrogation of CRMDs and chest x-ray were also performed at 1 day and 1 month after implantation to assess the lead integrity and lead position.

Results: Baseline characteristics did not differ between two groups. The angle of shoulder flexion and abduction decreased after implantation in 23.5% and 17.6% in exercise group and 29.4% and 23.5% in control group, respectively. Among those with limited shoulder range-of-motion, the magnitude of degreased shoulder flexion angle was greater in control group compared to exercise group (-20±8 vs. -8±4, P=0.049). Similarly, the magnitude of degreased shoulder abduction angle tended to be greater in control group compared to exercise group (-26±15 vs. -10±0, P=0.118). The shoulder function assessed by QuickDash scores was similar between two groups. One patient in the control group had atrial lead dislodgement but none did in pendulum exercise group.

Conclusion: Pendulum exercise on ipsilateral arm early after CRMDs device was safe and may reduce the risk of limited range-of-motion of ipsilateral shoulder. Due to the small number of study, the larger population is needed to clarity this issue.

Thai Heart Journal

RF 17

Differentiating Atrioventricular nodal reentrant tachycardia from orthodromic Atrioventricular reciprocating tachycardia using combination conventional criterias is more accurate

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Background: There were four ECG criterias : pseudo-r' in V1, pseudo-s' in inferior lead, notching in avL, and pseudo-r' in avR; for discriminate atrioventricular nodal reentrant tachycardia (AVNRT) from orthodromic atrioventricular reentrant tachycardia (AVRT), but clinical useful are limited.

Objective: The propose of this study was to evaluate the combination of ECG criterias for discriminate AVNRT fromorthodromic AVRT was more accuracy than any single currently available ECG criteria.

Medthods: A 12-lead ECG was recorded in 94 consecutive patients with narrow QRS complex tachycardia (NCT)-supaventricular tachycardia (SVT) were examined and categorized by physicians who work at cardiology department. The tachycardia mechanism was confirmed by electrophysiological study.

Results: In our study, there were predominantly female (52 vs 80%, mean age 46.6 years) and more patients with AVNRT(N = 65, 69.1%). The result showed the diagnostic accuracy concerning specificity and positive predictive value (PPV) were the followings: notching in avL (Specificity 78.6 %, PPV 82.9%), pseudo-r' in V1 (Specificity 75 %, PPV 81.6%), pseudo-s' in inferior lead (Specificity 71.4 %, PPV 81%),and pseudo-r' in avR (Specificity 53.6 %, PPV 77.2%). After analyze for the accuracy for possible combination criterias, the accuracy of combination of notching in avL and pseudo-r' in V1 was comparable to all 4 combination ; specificity [93.7% vs 96%, P = 0.394]; and PPV [87.5 % vs 92.3, P = 0.275].

Conclusions: Presence of notching in avL plus pseudo-r' in V1 provided a good accuracy and better than any single conventional criteria for diffentiation between AVNRT and orthodromic AVRT, and may be useful in clinical practice.

Keywords: • Atrioventricular nodal reentrant tachycardia • Atrioventricular reciprocating tachycardia • electrocardiography • diagnostic accuracy • combination criteria

RF 18

The prevalence of atrial fibrillation in stroke patients with normal sinus ECG at first presentation in Bhumibol Adulyadej Hospital

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Introduction: Atrial fibrillation is a form of cardiac arrhythmia characterized by low-amplitude baseline oscillations (fibrillatory or f waves) and an irregularly irregular ventricular rhythm in the electrocardiography. It is indeed the most common form of arrhythmia in clinical practice. Atrial fibrillation is an important risk factor for developing stroke and systemic embolism by independently increasing risk of stroke about 5-fold throughout all ages. Atrial fibrillation is sometimes asymptomatic and is not able to be detected under an ordinary cardiac rhythm monitoring. Hypothetically, the longer period of monitoring will gain the better chance of atrial fibrillation detection.

Objective: To determine the prevalence of new atrial fibrillation in stroke-admitted patients who has normal sinus rhythm electrocardiogram on admission by using in-hospital telemetry.

Patients and Methods: This study was a cross-sectional descriptive prospective study enrolled in-patients at stroke unit with clinical diagnosis of ischemic stroke and normal sinus electrocardiogram in year of 2016. There were clinical parameters including demographic data, current medications, type of stroke, NIHSS, LAVI and telemetry time collected. The status of new atrial fibrillation was analyzed. The values were compared using Logistic regression. The clinical variable P-value of less than 0.05 considered statistically significant.

Results: A total number of 193 patients were eligible for the enrollment. About 60% of them were male. The mean age of patients was 66.32±12.26 years old, the mean weight was 64.88±13.83 with 63.02% of patients were overweight and obesity. About one-third of patients had history of alcoholic drinking (37.30%) and smoking (35.75%). The frequent medical illnesses found in the stroke patients were hypertension (64.77%), diabetes mellitus (45.08%), hyperlipidemia (35.75%), previous ischemic stroke (20.73%) and coronary artery disease (8.29%). Lacunar infarction was the most common type found in stoke unit followed by large-artery atherosclerosis, cardioembolism and the least common type was transient ischemic attack. Of all stroke patients, new atrial fibrillation was found 13 out of 193 patients (6.74%) and 69.2% were female. In new atrial fibrillation group, patients were older (mean age 75.62 ± 8.46) compare with no atrial fibrillation group (mean age 65.64 ± 12.27), and most common type of stroke was cardioembolism. Time to detect new atrial fibrillation was less than 24 hours in 38.5 %, 24-48 hours in 15.4%, 48-72 hours in 7.7%, and a least 72 hours in 38.5% of patients.

Conclusion: The prevalence of new atrial fibrillation detected by in-hospital telemetry was 6.74% about one-third detected in first day of admission and about one-third detected after 3 days of admission.

Keywords: Atrial fibrillation, Ischemic stroke

RF 19

ST segment value of lead V2-V3 in asymptomatic patient

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Introduction: Acute coronary syndrome (ACS) is one of common and dreadly disease in clinical practice, especially when involved anterior wall of left ventricle. Electrocardiography is the simple and valuable tool for investigated ACS. However, ST segment value particularly in lead V2-V3 is vary and depend on sex, age and race. Further study in this value should be warrant.

Objective: To evaluated the ST segment value of lead V2-V3 in asymptomatic Thai male population.

Method: We review 2,300 persons from OPD clinic in Phramongkutkloa hospital. We exclude who have history of ischemic heart disease, abnormal conduction disease (ie. Bundle branch block, pre-excitetation pattern, any degree of AVB, hypertensive heart disease). We collect demographic data and measure ST80 and S wave of lead V2 and V3.

Results: After exclusion by protocol, total 239 ECG are analyzed. Mean age is 55.6±5.87 years, mean ST segment of lead V2 is 2.04±0.78 mV and mean ST segment of lead V3 is 1.68±0.76 mV. The mean ST segment of lead V2 in age $\geq$ 55 years old group and in age < 55 years old group is 1.96±0.75 and 2.19±0.82 mV respectively, there are significant statistic difference between both group(p-value = 0.03). In correlation analysis, ST segment of lead V2 is inversely correlation with age (Pearson correlation -0.143, P-value 0.027) and ST segment of lead V2-V3 are correlation with S wave voltage of lead V2-V3 with significant statistic.

Conclusion: ST segment value is inversely correlation with age and correspondingly correlates with S wave value. Mean ST segment value of lead V2-V3 in asymptomatic Thai population is not differ from Chinese and Caucasian population.

RF 20

Effect of curcumin on matrix metalloproteinase-9 level in sick sinus syndrome patients with paroxysmal atrial fibrillation who received dual chamber pacemakers: A randomized double-blind placebo controlled study

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Background: The incidence of atrial fibrillation (AF) is higher in patients with sick sinus syndrome than in the normal population. It can be explained via fibrosis of atrial tissue which plays an important role in the development and maintenance of AF. Matrix metalloproteinase 9 (MMP-9), a fibroinflammatory biomarker, has been found to be associated with severity of atrial fibrillation. Curcumin, which has anti-inflammation and anti-fibrotic properties, may have potential to reduce serum MMP-9 and hence reduce the recurrence of AF in these patients.

Method: In this randomized double-blind placebo controlled study, 16 patients with sick sinus syndrome who had dual chamber pacemaker implantation and at least one episode of atrial high rate episode (AHRE) ≥ 5min detected by pacemakers were assigned to receive either curcumin capsule (AntiOx by GPO, Thailand) 2g/day or placebo for 3 months. Serum MMP-9 level, hs-CRP and other biochemical tests were analyzed at enrollment and the end of the study. Episodes of AHRE during a 3-month run-in period and at each month during study period were also recorded. Primary outcome was the difference in the change of serum MMP-9 level over 3-month study period between curcumin and placebo group. Secondary outcomes included difference of total AF duration, maximum AF duration, number of episodes of AHRE ≥ 1 min, ≥ 5 min and ≥ 5.5 hr between two groups. Differences of secondary outcomes between run-in and study period were also analyzed.

Results: Baseline characteristics were not significantly different between two groups except the total AF duration (2541.5 min vs. 670 min, p = 0.709) and maximum AF duration (866 min vs. 426.6 min, p = 0.834) were slightly longer in the curcumin group. There was no significant difference in the change of serum MMP-9 level between curcumin and placebo group (+0.90% vs. -26.71%, p = 0.400). Total AF duration was shorter in the curcumin group than in the placebo group despite longer duration during run-in period but this was not statistically significant (1196 min vs. 2010 min, p = 0.674) Furthermore, maximum AF duration, number of episodes of AHRE ≥ 1 min, ≥ 5 mins and ≥ 5.5hrs were not significantly different between two groups. When compared with run-in period, all of the secondary outcomes in both groups tended to increase. Interestingly, the increase in total AF duration in the curcumin group was less than placebo group (+ 54.5 min vs. + 1546 min, p = 0.195). Moreover, the increase in maximum AF duration (+49 min vs. + 173 min, p = 0.442), number of episodes of AHRE ≥1 min (+8.75 vs. +13.38, p = 0.708), ≥ 5 min (+5.38 vs. + 12, p = 0.472) and ≥5.5 hr (0 vs. +0.5, p = 0.417) were smaller in the curcumin group.

Conclusion: Curcumin could not reduce the serum MMP-9 level in patients with sick sinus syndrome who have paroxysmal AF. However, curcumin seems to reduce the progression of AF in terms of total AF duration, maximum AF duration and number of AF episodes. Therefore, it is hypothesized that curcumin may exert an ameliorative effect on progression of AF that might be explained by a mechanism other than the MMP-9 pathway. Further study in a larger population is required to support this hypothesis.

Thai Heart Journal

RF 21

Optimal INR to prevent stroke in Thai patients with rheumatic mitral stenosis and atrial fibrillation who are receiving warfarin

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Many study for nonvalvular AF in Asia and Thai population showed the INR is between 1.5 and 3.0 could be optimal to prevent thromboembolism without increasing major hemorrhage. Optimal INR for Rheumatic mitral stenosis and AF in Thai patients, however, has not been clarified thoroughly as yet.

Objective: To determine the optimal INR to prevent stroke in Thai patients with rheumatic mitral stenosis and AF who are receiving warfarin.

Material and Method: Retrospective study enrolled 184 rheumatic mitral stenosis with AF patients who received warfarin in King Chulalongkorn Memorial Hospital between January 1, 2010 and December 31, 2015 and collected the lNR level at the time of the event, the numbers of ischemic stroke, and bleeding events. The INR range was classified into 6 groups (<1.50, 1.50-1.99, 2.00-2.49, 2.50-2.99, 3.00-3.49 and ≥3.5). The incidence density of ischemic stroke and bleeding events in each INR group was calculated with the summation of the time that each patient stayed in each INR group.

Results: 184 MS with AF patients (the mean age 55.7 years, female 146 (79.34%)) were enrolled, for total follow up period of 714.44 patient-year. 28 patients experienced 35 ischemic stroke events (4.90 per 100 patient-years) and 36 patients experienced 55 bleeding events (7.70 per 100 patient-years). The INR level less than 2.00 increased incidence density of ischemic stroke (Relative risk 1.57; 95% CI 1.189-2.093. P = 0.028). The INR level more than 2.99 increased incidence density of total and major bleeding events (Relative risk 2.467; 95% CI 1.881-3.234. P < 0.001 and Relative risk 3.069; 95% CI 2.436- 3.868. P<0.001, respectively). The overall of ischemic stroke and bleeding event rate was lowest in the INR range from 2.00 to 2.99.

Conclusion: An INR between 2.00 and 2.99 could be associated with the lowest incidence density rate of ischemic stroke and bleeding event in Thai MS with AF patients who receiving warfarin. The optimal INR for MS with AF patient is more than the optimal INR in previous study for nonvalvular AF in Asia and Thai patients.

Research by Fellow

Group 3

Poster Presentation
Friday 24 March, 2017
Time: 17:30-19:30
Venue: @ State Room 2A+2B

Judges: *Rapeephon Kunjara-Na-Ayudhya, MD*
Rungsrit Kanjanavanich, MD
Nakarin Sansanayudh, MD
Aekarach Ariyachaipanich, MD

RF22 **Effect of inhaled nebulized nitrite on pulmonary arterial pressure and right ventricular function in HbE/beta thalassemia patients with pulmonary arterial hypertension**
Teewin Rakyhao, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

RF23 **Arterial stiffness and ventricular-arterial coupling in patients with chronic kidney disease and heart failure with preserved ejection fraction**
Sukhum Tachasakunjaroen, MD
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RF24 **LDL cholesterol and 1 year mortality rate of acute ST-elevation myocardial infarction patients in King Chulalongkorn Memorial Hospital**
Osit Bambat, MD
Division of Cardiovascular Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

RF25 **Association between Visit-to-visit blood pressure variability and severity of coronary heart disease**
Kunlawat Promchaiwattana, MD
Cardiology Division, Department of Internal Medicine, Police General Hospital, Bangkok, Thailand

RF26 **Arterial stiffness among patients who receiving anthracycline-based chemotherapy**
Promrak Juengwiroj, MD
Cardiology Division, Department of Internal Medicine, Police General Hospital, Bangkok, Thailand

RF27 **Plasma NT pro-BNP levels as a predictor of persistent pulmonary arterial hypertension in secundum type ASD patients after transcather ASD Closure**
Kwanhatai Manossudprasit, MD
Cardiology fellow, Division of cardiology, Central Chest Institute of Thailand, Nonthaburi, Thailand

RF28 **Can available predicting models predict serum digoxin level in Thai patients?**
Jirarat Jiratham-Opas, MD
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RF29 **The effect of energy drink with caffeine on blood pressure in Thai people**
Benya Roungrojwichai, MD
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RF30 **The effect of nocturnal work shift on circadian blood pressure pattern in normotensive personal at Rajavithi hospital**
Kitiwat Chutpongtada, MD
Division of Cardiology, Department of Medicine, Rajavithi Hospital, Bangkok, Thailand

RF31 **Prevalence of iron deficiency anemia in patients with heart failure and anemia**
Wittawat Wattanasiriporn, MD
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RF32 **Predictive factors on echocardiogram requisition for pulmonary hypertension in Phramongkutklao Hospital**
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RF 22

Effect of inhaled nebulized nitrite on pulmonary arterial pressure and right ventricular function in HbE/beta thalassemia patients with pulmonary arterial hypertension

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Background: Pulmonary arterial hypertension (PAH) is one of several cardiovascular complications in patients with thalassemia and significant cause of mortality and morbidity. The etiology is multifactorial and one of the important mechanism is decrease in nitric oxide (NO) which results in vasoconstriction and increase pulmonary pressure. Nitrite, the NO precursor acts as pulmonary vasodilator in animal. However, the efficacy data of this therapeutic option in thalassemia patients with pulmonary arterial hypertension is not well established.

Method: Ten hemoglobinE/ beta-thalassemia patients with pulmonary arterial hypertension were enrolled in this study. We measure the mean pulmonary arterial pressure (MPAP), right ventricular systolic pressure (RVSP) and right ventricular function parameters using echocardiogram. The mean pulmonary arterial pressure (MPAP) value > 25 mmHg is determined the presence of PAH. The patients received 15 mg inhaled sodium nitrite via jet nebulizer for 10 min compare to placebo and study the effect on pulmonary arterial pressure. The primary outcome was the decrease in RVSP during giving nitrite measured by echocardiogram and secondary outcome were change in RV function parameters.

Results: Of 10 thalassemia patients with pulmonary arterial hypertension. The mean age of patients was 47.4 years old. The mean MPAP was 37.63 mmHg. The mean RVSP at baseline was 64.51 mmHg and significantly lower at 4 min, and 6 min after started giving 15 mg of inhaled nebulized nitrite compare to placebo (mean RVSP at 4 min and 6 min vs placebo was 60.43 vs 66.69 mmHg and 58.91 mmHg vs 67.42 mmHg, p value 0.022 and 0.019, respectively).

Conclusion: In HbE/beta-thalassemia patients with pulmonary arterial hypertension, giving 15 mg of inhaled sodium nitrite via jet nebulizer significantly decreased pulmonary arterial pressure compare to placebo.

Keywords: Inhaled sodium nitrite, Thalassemia, pulmonary arterial hypertension

RF 23

Arterial stiffness and ventricular-arterial coupling in patients with chronic kidney disease and heart failure with preserved ejection fraction

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Background: The interplay of cardiac function and vascular system is represented by ventricular-arterial coupling (VA coupling). Arterial stiffness measured by the cardio-ankle vascular index (CAVI) is proposed to be a surrogate marker of systemic vascular resistance. Abnormal ventricular-arterial coupling and arterial stiffness may contribute to pathophysiology of heart failure with preserved ejection fraction (HFpEF) especially in patients with chronic kidney disease (CKD). We hypothesized that such patients display abnormal ventricular-arterial coupling and arterial stiffness when compared to asymptomatic chronic kidney disease patients.

Method: Non-invasive ventricular-arterial coupling calculated by echocardiographic parameters and CAVI were measured in CKD patients enrolled from CORE-CKD cohort between October 2015 to December 2016. CKD patients with HFpEF are those with history of NYHA class III/IV symptoms with either elevated NT-proBNP or radiographic evidence of pulmonary congestion who were referred for echocardiogram. Independent samples T-test was used to compare the VA coupling and CAVI between CKD patients with HFpEF and without HFpEF.

Results: Forty two CKD patients was enrolled, 24 were male (67%), The mean age of patients was 67.6 years (range 53-84). The mean eGFR was 34.4 ml/min/1.73m2. Of the 42 patients, 13(31%) had HFpEF. The mean CAVI and VA coupling were 9.1±1.6 and 0.85±0.22 respectively. The mean CAVI was significantly higher in HFpEF compared with patient without HFpEF (10.3±1.8 vs. 8.37±1.1, p= 0.005) and mean VA coupling was significantly higher in HFpEF compared with patient without HFpEF (0.97±0.23 vs 0.73±0.18, p= 0.014), adjusted of age, gender and blood pressure. Using CAVI and VA coupling as a predictor of HFpEF in CKD yielded the AUC of 0.81 and 0.72 respectively. CAVI of ≥ 8.8 (sensitivity 85%; specificity 62%) and VA coupling of ≥ 0.75 (sensitivity 85%; specificity 45%) are associated with the presence of HFpEF in CKD patients.

Conclusion: CKD patients with HFpEF have arterial stiffening and ventricular-arterial coupling beyond that associated with CKD. This finding may underlie pathophysiological role of HFpEF in this setting by exacerbating systemic load interaction with diastolic dysfunction, augmenting blood pressure liability resulting in rapid onset pulmonary edema.

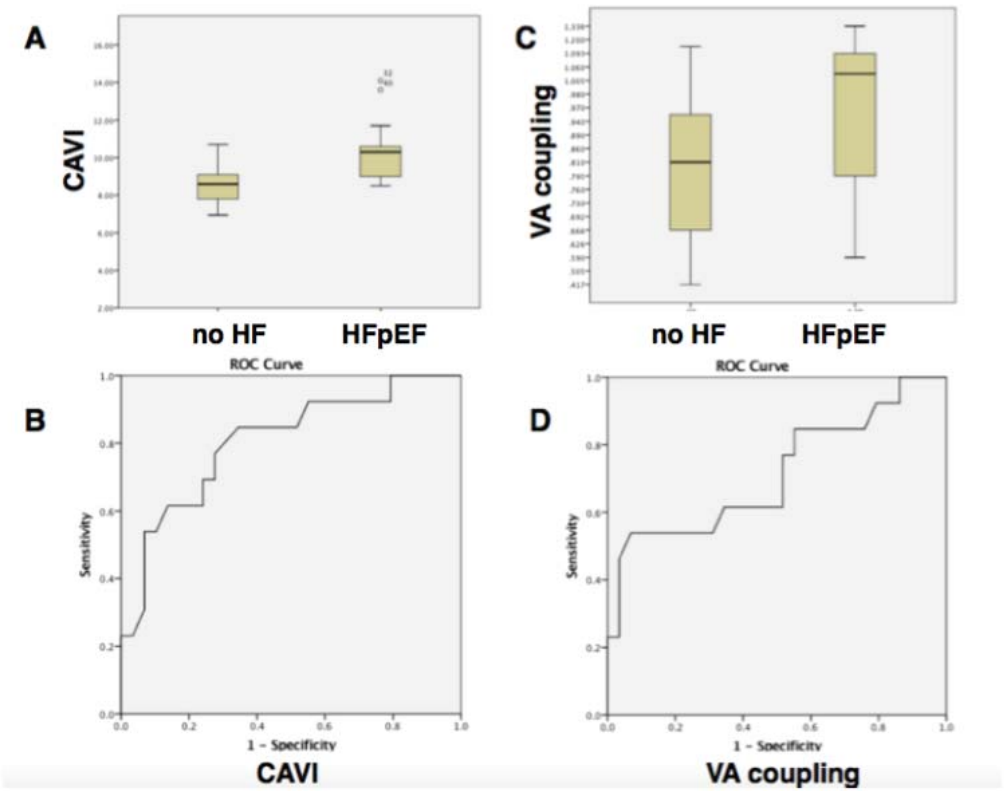

Fig.1. Box-and-Whisker plot of CAVI and VA coupling with CKD patients with and without HFpEF. (A and C) and Receiver Operating Characteristic (ROC) curve of CAVI and VA coupling in CKD patient with and without HFpEF (B and D).

Thai Heart Journal

RF 24

LDL cholesterol and 1 year mortality rate of acute ST-elevation myocardial infarction patients in King Chulalongkorn Memorial Hospital

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Background: Dyslipidemia is one of the common risk factor of coronary heart disease. According to Thai Registry in Acute Coronary Syndrome (TRACS) which involved in 75% of patients. In Korean Acute Myocardial Infarction Registry (KAMIR), patients who had lower LDL cholesterol level (LDL-C) had higher 1 year mortality than the patients who had higher LDL-C level. However, there were not LDL-C and 1 year mortality data in Thailand.

Methods: In this retrospective study, there were 1,542 consecutive acute STEMI patients since 1999-2015 in King Chulalongkorn Memorial Hospital. 378 were excluded due to no LDL-C data within 24 hours after diagnosed acute STEMI. Patients were classified into 4 groups according to LDL-C level: <70 (group1), 70-99 (group 2), 100-129 (group 3) and >130 mg/dl (group 4). The primary end point was 1 year all-cause mortality rate. The risks that may effect to 1 year mortality were also analyzed.

Results: At 1 year after diagnosed STEMI who underwent revascularization, the all-cause mortality rate were 23.0%, 21.2%, 12.3% and 9.2% in group1, group 2, group 3 and group 4, respectively. When compared with group 4, the hazard ratio (HR) was 2.72 (confidence interval (CI) 1.62-4.57; P<0.001) for group 1, 2.45 (CI 1.64-3.66; P<0.001) for group 2 and 1.35 (CI 0.89-2.06; P=0.153) for group 3. In multivariate analysis, the risk factors or predicting of 1 year mortality rate were left ventricular ejection fraction <40% (HR 2.18; CI 1.66-2.86, P<0.001), Killip class IV (HR 2.16; CI 1.56-3.00, P<0.001), creatinine >1.5 mg/dl (HR 2.11; CI 1.57-2.83, P<0.001), cardiopulmonary resuscitation (HR 1.98; CI 1.44-2.72, P <0.001), and culprit lesion at left main (HR 1.69; 95% CI 1.07-2.66, P=0.024).

Conclusions: Lower LDL-C group (<70 and 70-99 mg/dl) at time of diagnosed acute STEMI associated with higher 1 year mortality rate than higher LDL-C group (>130 mg/dl).

RF 25

Association between visit-to-visit blood pressure variability and severity of coronary heart disease

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Background: Visit to visit variability (VVV) of blood pressure (BP) had been shown as an independent predictor for all cardiovascular disease events including patients with stroke, myocardial infarction, heart failure and even angina. The present study was designed to address the relation of VVV of BP with severity and complexity of coronary heart disease and the cardiovascular risk factors.

Method: We retrospectively reviewed the subjects who were hypertension and underwent coronary angiography. The standard deviation (SD) of BP across visits and coefficient of variation (CV) were defined as VVV of BP. The complexity of coronary heart disease was assessed by number of vessels disease and calculated in SYNTAX score. SYNTAX score was defined in low SYNTAX group (<23) and intermediate to high SYNTAX group (23 to highest score).

Result: Overall study subjects were 136 subjects (Age 66 ± 11 years, 84 subjects were male) who underwent coronary angiography. One hundred of 136 subjects had obstructive coronary lesions. There were no significant difference between the severity among SYNTAX groups in the mean of SD of SBP (11.0 ± 6.0 mmHg in intermediate to high SYNTAX group vs. 12.2 ± 6.8 mmHg in low SYNTAX group, P=0.38), CV of SBP (8.3 ± 4.6% vs. 8.8 ± 4.9%, respectively, P=0.61), SD of DBP (7.7 ± 5.7 mmHg vs. 8.9 ± 5.1 mmHg, respectively, P=0.26) and CV of DBP (10.5 ± 7.4% vs. 11.8 ± 6.9%, respectively, P=0.40). There were also no significant difference of mean of VVV of BP among number of vessels disease. GFR ≥ 60 ml/min was the only factor which had lower VVV of BP while others including antihypertensive medication had not be shown.

Conclusion: The present study demonstrated no association in severity and complexity of coronary heart disease to VVV of BP.

Keyword: VVV of BP, SYNTAX score

Thai Heart Journal

RF 26

Arterial stiffness among patients who receiving anthracycline-based chemotherapy

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Background: The improving in cancer therapy leads to increase in survival patients, however these patients still have high cardiovascular morbidity and mortality, especially patient who received anthracycline-based chemotherapy. Although these patients had normal cardiac function, increased in arterial stiffness due to anthracycline base chemotherapy was an independent predictor for cardiac events and cardiovascular mortality. Thus CAVI (cardio-ankle vascular index) is one of non-invasive technique for evaluating arterial stiffness, low cost, simplicity, accuracy compared to gold standard measure of arterial stiffness. The study aims to determine whether or not detecting changed in arterial stiffness using CAVI among patients who receiving anthracycline- base chemotherapy.

Method: This observational follow-up study was performed involving 15 patients who have breast cancer and lymphoma before and after-treatment with anthracycline-based chemotherapy. Baseline characteristics included gender, age, vital sign, comorbidities, current medication, cumulative dose of anthracycline, were collected. All participants underwent CAVI and echocardiogram for assessment of LV and RV systolic and LV diastolic function before and after chemotherapy.

Results: The averaged age were 57±12 years (range 34 – 75), 87% were women, received a range of 60 to 238 mg/m2 of doxorubicin. At follow-up visit, there were no significant changed in right, left and averaged of right and left CAVI, 7.47±1.70 to 7.39±0.75, p = 0.80, 7.63±1.70 to 7.52± 0.97, p = 0.71 and 7.55±1.65 to 7.45±0.84, p = 0.74, respectively, comparing to baseline. Likewise in the other method of measuring arterial stiffness eg. TAC (Total arterial compliance; SVi/PP; stroke volume to pulse pressure ratio and index) showed no significant changed (0.97±0.24 to 0.96±0.29, p=0.94) after receiving anthracycline-based chemotherapy.

However, after receiving anthracycline -based chemotherapy compared to baseline, LVEF (left ventricular ejection fraction) was significantly decreased from 66.98±7.07 to 61.86±1.70, (95% CI = -7.47 -2.75, p < 0.001), increased in LVEDD (left ventricular end diastolic diameter) and LVESD (left ventricular end systolic diameter) from 4.19±0.47 to 4.50±0.33, p=0.003 and 2.53±0.37 to 2.96±0.40, p<0.001, respectively. Also, the LV diastolic function was abnormal as E' (early filling to early diastolic mitral annular velocity) was significant lower from 8.73±2.74 to 7.27±2.82, (95% CI = -2.22 to -0.72, p = 0.001) and E/E' ratio (the ratio of mitral peak velocity of early filling to early diastolic mitral annular velocity) was elevated from 9.12±3.00 to 11.67±4.09, (95% CI = 1.39 to -3.70, p < 0.001). Similarly LV, RV was decreased in systolic function, using lateral S' (Systolic tricuspid valve lateral annular velocities) from 12.11±1.77 to 10.20±1.03 (95% CI = 0.78 to 3.04, p =0.005).

Conclusion: In the cancer patients who receiving low to moderate dose of anthracycline-based chemotherapy, there was no significant changed in arterial stiffness using either CAVI or TAC method, whereas significant worsening of the biventricular myocardial function. Further evaluation of arterial stiffness by other methods should be warranted.

RF 27

Plasma NT pro-BNP levels as a predictor of persistent pulmonary arterial hypertension in secundum type ASD patients after transcather ASD closure

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Background: Persistent pulmonary arterial hypertension (PAH) after ASD closure in patients with secundum type atrial septal defect is associated with high morbidity and mortality. There were few reports of biomarkers as predictors of reduction of pulmonary artery pressure (PAH) after transcatheter ASD closure.

Objective: To determine whether the NT-proBNP level can use as predictor of resolution of PAH in secundum type ASD patient after trancatheter ASD closure. (TAC).

Method: A prospective cohort study was conducted among secundum type ASD patients who underwent TAC in Central Chest Institute of Thailand between January 2016 and June 2016. Clinical characteristics, NYHA functional class, echocardiographic parameters including right atrium (RA) areas, right ventricular (RV) areas, right ventricular (RV) function, maximal tricuspid regurgitation velocity (TR Vmax), right ventricular systolic pressure (RVSP) and mean pulmonary artery pressure (mPAP) were assessed before and 6 months post TAC. All clinical and echocardiographic parameters were compared between patients with normal and high baseline NT-proBNP (≥200 pg./ml). Resolution of PAH was defined as mean pulmonary artery pressure post TAC <25 mmHg and persistent PAH was defined as mean pulmonary artery pressure post TAC ≥ 25 mmHg. Chi-square test was used to determine significance of the results between both groups. At P value <0.05 was considered to be statistically significant.

Results: A total of 30 patients were studied. Of these, 20 patients had normal baseline NT-proBNP (group 1) and 10 patients had high baseline NT-proBNP (group 2). The overall mean age was 42 years old and 20% of patients were male. There were no differences in demographics, underlying diseases, history of drug uses or echocardiographic parameters such as RA size or RV size or RV function between both groups. Four patients in group 2 (40%) had persistent PAH after TAC whereas none in group 1. The patients with high baseline NT-proBNP had significant persistent PAH comparing with those with normal baseline NT-proBNP (p=0.008).

Conclusion: Secundum type atrial septal defect patients with high baseline NT-proBNP had more prevalence of persistent pulmonary arterial hypertension after transcatheter ASD closure comparing with those with normal baseline NT-proBNP.

Keywords: Secundum atrial septal defect patients, Transcatheter ASD closure, Persistent pulmonary arterial hypertension, NT-proBNP

RF 28

Can available predicting models predict serum digoxin level in Thai patients?

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Background: Digoxin has been commonly prescribed for heart failure reduced ejection fraction (HFrEF) patient and atrial fibrillation patient. Due to its narrow therapeutic range, monitoring serum digoxin concentrations (SDC) is important. However, SDC measurement is not widely available. Equations using clinical parameters can estimate SDC but have never been studied in Thai population. Therefore, we conducted this study to test the correlation between measured SDC and predicted digoxin level using 2 common equations; Konishi equation and Koup and Jusko equation.

Methods: It was a prospective, cohort study conducted in Chiang Mai University. There were 101 HFrEF and/or atrial fibrillation patients who received digoxin for at least 4 weeks recruited in this study. The SDC was measured at steady concentration and defined into 3 groups according to DIG trial as in therapeutic range, over therapeutic range and suboptimal range.

Results: There were significant correlations between measured and predicted SDCs by the Konishi equation and Koup & Jusko equation with a correlation coefficient (R) of 0.70 and 0.50 ($P < 0.001$ for both) respectively. The measured SCDs definding as in therapeutic range, over therapeutic range and suboptimal range were 27.7%, 9.9% and 62.4% respectively. The sensitivity and specificity of predicted SDC by Konishi equation in predicting over therapeutic range were 80% [95%CI 44.4-97.5%] and 81.1% [95%CI 71.5-88.6%]. There were 4 patients (3.9%) rehospitalization, only 1 patient (0.9%) was rehospitalized due to acute decompensated heart failure with high rate atrial fibrillation and acute kidney injury precipitated by NSAID use. No patient was rehospitalized with digoxin toxicity.

Conclusions: The Konishi equation has higher predictive value for calculating measured level than Koup and Jusko equation. This high predictive value for over therapeutic SDC of Konishi equation can be useful in predicting SDC in clinical practice after validated in larger population study.

RF 29

The effect of energy drink with caffeine on blood pressure in Thai people

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Background: Previous studies have show that caffeine can raise blood pressure for a short period time. The dose of caffeine used was 200-240 mg and most study were in caucasians. There is no data in the Thai population. The Thai government recommends a dose of limit of caffeine of less than two bottles per day. Many middle age Thais consume energy drinks and it is essential to know more regarding the effect of energy drink on blood pressure.

Objectives/Goals: The objective is to determine if a thai energy drink with caffeine will change the blood pressure of people by monitoring with ABPM.

Methods/Materials: The 34 health volunteerswere double-blind randomly assigned to two groups. One group consumed 100 mg of an energy drink containing caffeine (two bottle of M-150) and the other group consumed a placebo drink. After abstaining from caffeine containing foods for at least 72 hours, baseline ABPM was recorded in all the volunteers. The interval between two recordings was at least three day. The second record were done with either juice or energy drink. The volunteer consumed the drink 30 minutes after beginning ABPM monitoring. Data was analysis by ANNOVA and chi-square test.

Result: Baseline BP was normal in the two groups. Mean systolic BP was 111.94±7.53mmHg before energy drink consumption and was 113.12±12mmHg after energy drink consumption. Mean systolic BP was111.47+10.2mmHg before placebo consumption and was 115.12+13mmHg after placebo drink consumption. Mean systolic BP changed1.41±4.1mmHg in the energy drink group compare to 3.18+6.1mmHg in the placebo group. There were no significant changes in the mean systolic BP between caffeine and placebo group (P = 0.438).

Mean diastolic BP was 66.53+4.9mmHg before energy drink consumption and was 70±70mmHg after energy drink consumption. Mean diastolic BP was 67.06+7.36mmHg before placebo consumption and was 69.06+8.4mmHg in after placebo drink consumption. Mean diastolic BP changed 3.41±5.59 mmHg in the energy drink consumption compare to 2±4.0mmHg the placebo group. There were no significant changes in mean diastolic BP between caffeine and placebo group P =0.743. Mean MAP was 81.41±41mmHg before energy drink consumption and was 84.12±7mmHg in after energy drink consumption. Mean MAP was 81.53±7.9mmHg before placebo consumption and was 84.18+9.66mmHg after placebo drink consumption. Mean MAP changed 2.71±4.34mmHg in the energy drink consumption compare to 2.71+4.5mmHg the placebo group. There was no significant change in mean MAP after consuming caffeine. P =0.57.

Conclusion: Drinking two bottles of thai energy drinks did not effect the 24 hr AMBM blood pressure significantly.

Keyword: energy drink, caffeine, SBP, DBP, MAP.

Thai Heart Journal

RF 30

The effect of nocturnal work shift on circadian blood pressure pattern in normotensive personal at Rajavithi hospital

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Background: Cardiovascular disease (CVD) is a major public health problem.The prevalence of disease in Thailand is increasing due to lifestyle changes including working on night shift .If the blood pressure does not decrease at night-time ("the non-dippers" factor), the long term risk of cardiovascular disease may increase. Ambulatory blood pressure monitoring (ABPM) 24 hours can identify this risk factor. This study determined the effect of nocturnal work shift on circadian blood pressure pattern in normotensive personal.

Objectives: The ABPM was used to determine the effect of working a nocturnal shift on circadian blood pressure pattern in normotensive personal in Rajavithi hospital.

Materials/Methods: The study was a Prospective cross-sectional study between 1 June 2016 to 31 December 2016. Participants were healthy volunteer without hypertension working the night shift in Rajavithi hospital. Ambulatory BP monitoring (ABPM) was measured for at least 2 consecutive days during their night working hours and at daytimes on another day.

Result: Sixty-seven participants were enrolled. A total of 82.1% subjects were female. The mean average age was 25.64±5.32 years. On the basis of ABPM 55.2 % patients were classified as non-dippers. About 35.8% of those working night shift changed from dippers to non-dippers which was related to an increased duration of sleep during the night shift and we also found 11.2% changed from non-dippers in a daytime to dippers in night working hours which was related to an increased duration of sleep during night shift.

Conclusion: A total of 55.2% of healthy volunteers working the night shift were non-dippers. The duration of sleep was correlated with the change of dipper to non-dipper same as non-dipper to dipper.

Keyword: Ambulatory blood pressure monitoring, nocturnal dipping of the blood pressure, nighttime (asleep) blood pressure, cardiovascular risk

RF 31

Prevalence of iron deficiency anemia in patients with heart failure and anemia

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Background: Iron deficiency anemia is a common finding in congestive heart failure patients. Anemic symptoms such as dyspnea and fatigue may be caused by decreased oxygen delivery to tissues. Iron deficiency anemia in previous studies was associated with and increase in all cause mortality and heart failure hospitalization for heart failure. Only few studies in Thailand have been published. The aim of this study was to determine the prevalence of iron deficiency anemia in anemic heart failure patients and identify the factors associated with iron deficiency anemia.

Material &Method: Prospective crossectional study since 1 March 2016 to 31 December 2016. Patients whose diagnosis heart failure in Rajavithi hospital were screened for anemia. Patients with hemoglobin level <13 g/dl in male and <12 g/dl in female were enrolled. Baseline characteristic were collected. Investigation include complete blood count, iron study profile, stool occult blood and echocardiography were sent at the enrolled date.

Result: Patients with acute blood loss and other diseases which cause anemia were excluded. Forty-seven anemic heart failure patients met the inclusion criteria and were enrolled. The prevalence of iron deficiency anemia was 27.7%. The mean age was 67.81 ± 15.74 years old and mainly male patients. The mean body mass index (BMI) was 22.52 ± 4.87 kg/m2. Most of the comorbidities were hypertension 74.5%, dyslipidemia 40.4% and diabetes mellitus 36.2%. Functional class of patient was NYHA class II 59.6% and class III 40.4%. The mean hemoglobin was 8.84 ± 1.41 g/dL and the mean hematocrit was 28.18 ± 3.72%. The mean ferritin was 131.38 ± 71.33 ng/dL. The mean serum iron was 62.89 ± 67.63 ng/dL. The mean total iron binding capacity (TIBC) was 407.26 ± 94.74 µg/dL. A total of 61.54% patients had stool occult blood positive. Heart failure with reduced ejection fraction was found in 68.1%. Factors that correlated with iron deficiency anemia when compare with anemia from other causes were male sex (69.2% vs 26.5%; p-value = 0.017), lower BMI (19.55 ± 3.66 kg/m2 vs 23.24 ± 4.94 kg/m2 ; p-value = 0.019), higher NYHA class III (76.9% vs 26.5%; p-value = 0.017), lower hemoglobin (8.01± 1.60 g/dL vs 9.16 ± 1.21 g/dL; p-value = 0.012), higher stool occult blood positive (61.54% vs 8.82%; p-value <0.001).

Conclusion: The prevalence of iron deficiency anemia in patients with heart failure and anemia was 27.7%. Male sex, lower BMI, higher NYHA, greater degree of anemia, positive stool occult blood were factors that correlated with iron deficiency anemia.

Keyword: Heart failure, Iron deficiency anemia

Thai Heart Journal

RF 32

Predictive factors on echocardiogram requisition for pulmonary hypertension in Phramongkutklao hospital

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Background: Pulmonary hypertension (PH) involved in many clinical conditions with distinct pathophysiology and clinical features. Echocardiography has become an excellent non-invasive screening test for patients with symptoms and risk factors suspected pulmonary hypertension as well as providing a key information on both etiology and prognosis.

Objective: To identify predictive factors from echocardiogram requisition for pulmonary hypertension.

Methods: Patients who was sent to do the echocardiogram with echocardiogram requisition suspected pulmonary hypertension were recruited. Eligible patients underwent standard transthoracic echocardiography study in echocardiographic lab in Phramongkutklao hospital. Risk factors were assessed in all patients. Echocardiographic pulmonary hypertension was defined following 2013 ASE Echocardiography in Pulmonary Arterial Hypertension Guideline.

Results: One hundred and one patients were enrolled. Sixty-four patients were female with mean age of 61.7 ± 17.1 years old. Mean pulmonary artery systolic pressure (PASP) was 41.26 ± 22.6 mmHg. The prevalence of echocardiographic pulmonary hypertension was 40.5%. Higher prevalence found in the group with underlying lung disease compared to the group without lung disease (46% versus 26%). From univariate analysis, lung disease, physical signs of PH, electrocardiogram, radiographic data and right ventricular dysfunction on echo were significant variables factors associated with higher PASP. However, on multivariate analysis, the electrocardiogram was the only independent risk factor predicting echocardiographic pulmonary hypertension with OR 15.11 (95% CI: 3.1-73.6), sensitivity 58.5% and specificity 93.3%.

Conclusion: The Right bundle branch block and RV strain on electrocardiogram were an excellent predictive factors for detecting echocardiographic pulmonary hypertension.

Keyword: Echocardiography, Pulmonary hypertension

Research by Fellow

Group 4

Poster Presentation
Friday 24 March, 2017
Time: 17:30-19:30
Venue: @ State Room 2A+2B

Judges: *Taworn Suithichaiyakul, MD*
Nithima Ratanasit, MD
Vichai Senthong, MD
Teerapat Yingchoncharoen, MD

RF33 **Performance improvement of electrocardiographic criteria in detection echocardiographically diagnosed left ventricular hypertrophy in Thai population**
Phanthaboon Wangpatharawanit, MD
Cardiovascular Unit, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

RF34 **Prediction of preoperative echocardiography variables and peri-operative cardiovascular events in intermediate risk non-cardiac surgery**
Tayanoon Kunawisarut, MD
Cardiology Division, Department of Internal Medicine, Police General Hospital, Bangkok, Thailand

RF35 **Prevalence of left ventricular diastolic dysfunction and its correlation with cardiac T2* by cardiac magnetic resonance imaging in thalassemia major patients with normal left ventricular systolic function**
Benjaporn Chinprateep, MD
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RF36 **Electrocardiographic ventricular conduction delay in patients with left ventricular dysfunction associated with left ventricular volume not septal scar**
Chanokporn Piempring, MD
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RF37 **Left atrial strain indices by 2D-speckle tracking echocardiography in healthy Thai population:**
Metha Jiamwutthinum, MD
Cardiology Unit, Department of Medicine, Faculty of Medicine, Thammasat University (Rangsit Campus), Pathumtani, Thailand

RF38 **Prevalence of staphylococcus aureus nasal carriage among patients undergoing elective cardiac surgery**
Noparat Oniem, MD
Division of Cardiology, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai,Thailand

RF39 **Mobile phone text messages to support treatment adherence and focus in intensive lifestyle modification in cardiac outpatient department**

Chookiat Feemuchang, MD
Cardiac center and Division of Cardiology, Department of Medicine, Faculty of Medicine, Vajira Hospital, Bangkok Metropolis University, Bangkok, Thailand

RF40 **Algorithm for diagnosing tuberculous pericardial effusion in Maharat Nakhonratchasima hospital**

Kowit Srirattanaviriyakul, MD
Department of Cardiology, Faculty of Medicine, Maharat Nakhonratchasima Hospital, Nakhonratchasima, Thailand

RF41 **Prediction of non-viable myocardium by ECG Q wave area: A 3.0 T cardiovascular magnetic resonance study**

Pathompong Kumpamool, MD
Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

RF42 **Incidence and risk factors of cardiovascular diseases among HIV patients in Thailand**

Patita Sitticharoenchai, MD
Division of Cardiovascular Medicine, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

RF43 **Effect of paeka capsule® on serum LDL-cholesterol in Thai patient with hyper-LDL cholesterolemia**

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RF 33

Performance improvement of electrocardiographic criteria in detection echocardiographically diagnosed left ventricular hypertrophy in Thai population

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Background: Left ventricular hypertrophy (LVH) is widely recognized as a strong predictor of cardiovascular morbidity and mortality. Nowadays, transthoracic echocardiography is a standard for assessing left ventricular mass in clinical practice. Electrocardiographic (ECG) criteria for a diagnosis of LVH were derived from Western adult populations. There are still limited data of the utility and accuracy of these ECG criteria in Asians who have differences in Anthropometric characteristics.

Objectives: To improve the diagnostic performance of standard ECG criteria for detecting LVH using echocardiographic determination of LV mass as the reference standard by generating the newly revised cut-off values in diagnostic criteria specific for Thai populations.

Methods: Participants with complete electrocardiogram and echocardiographic data from the Electricity Generating Authority of Thailand (EGAT) study were enrolled in 2012. Four standard ECG criteria; Sokolow-Lyon Voltage (Sok V), Sokolow-Lyon Product (Sok P), Cornell Voltage (Cor V) and Cornell Product (Cor P) were measured. Newly revised criteria were generated by using different threshold of standard criteria.

Sensitivity, specificity, and receiver operating characteristic (ROC) curve for the four ECG criteria were used to compare the performance of these criteria.

Result: A total of 1007 participants were enrolled (mean age 68.6 ± 4.5 year old, 60.4% male). 235 (23%) participants have echocardiographically diagnosed LVH. Among the four standard ECG criteria, Sok V criteria had the highest sensitivity for males (sensitivity 6.3 %, specificity 97.3 %), whereas Cor P criteria had the highest sensitivity in female (sensitivity 24.7 %, specificity 91.5 %) with presence of high specificity in all of these four criteria. Cor V and Cor P had higher correlation coefficients and AUCs than those of Sok V and Sok P in both genders (AUC: 0.571, 0.576 vs 0.504, 0.519 in males and 0.655, 0.628 vs 0.616, 0.625 in females, respectively). The newly revised at a cut-off value of 25 mm for the Sok V criteria showed better performance for identifying LVH in male comparing with standard criteria (sensitivity 23.9%, specificity 80.1%). QRS axis was also significantly correlated with left ventricular mass index (LVMi). None of the patients with LVH have QRS axis greater than 84 degree (sensitivity 100%, specificity 2%).

Conclusion: This is the first large-scale study to show the performance of the standard ECG criteria influenced by gender differences in elderly population. However, the sensitivities for the conventional cut-off values were generally low. Newly revised cut-off values of Sok V criteria can provide better performance for identifying LVH. Interestingly, patients with QRS axis greater than 84 degree are unlikely for echocardiographic diagnosis of LVH.

Key words: Left ventricular hypertrophy, electrocardiography, echocardiography

Thai Heart Journal

RF 34

Prediction of preoperative echocardiography variables and peri-operative cardiovascular events in intermediate risk non-cardiac surgery

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Background: The appropriated used of preoperative echocardiogram still inconclusive data. This study was determined to identify clinical characteristics and echocardiographic parameters whether or not to predict peri-operative cardiovascular (CV) events in 30 days.

Method: We retrospectively reviewed 20 cases who experienced of perioperative CV events in the Police General Hospital during 2012-2016; including death from any cause, acute myocardial infarction, heart failure, atrial fibrillation and stroke; comparing to randomly reviewed 30 cases of safety surgery which had previous preoperative echocardiogram. The echocardiographic parameters and clinical characteristics were collected and analysis for reveal association with peri-operative CV event.

Result: Left ventricular ejection fraction (LVEF) and Wall Motion Score Index (WMSI) was significant lower in complicated group; 57 +/- 22% vs 67 +/- 9% (p=0.029) and 1.01 +/- 0.22 vs 1.27 +/- 0.42 (p=0.006) respectively, and Left atrial end diastolic volume in apical four chamber view (LAEDV A4C) is larger in complicated group with 55 ml vs 80 ml. This demonstration of association with peri-operative CV event with LVEF >55% with odd ratio 7.0 (95% CI, 1.27-38.57, p=0.024) but not in diastolic function. The odd ratio of elevated E/E' > 15 is 0.92 (95% CI, 0.27-3.15, p=0.9). After accounting with age and diabetes, there was no significant association.

Conclusion: Among the patient who underwent intermediate operative risk procedure, preoperative echocardiogram did not show benefit of prediction in peri-operative CV event in 30 days.

Keyword: preoperative echocardiogram, peri-operative CV event, intermediate risk procedure

RF 35

Prevalence of left ventricular diastolic dysfunction and its correlation with cardiac T2* by cardiac magnetic resonance imaging in thalassemia major patients with normal left ventricular systolic function

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Background: Thalassemia major has high prevalence in Thailand, and its leading cause of mortality is iron overload cardiomyopathy. Cardiac T2* is used to detect cardiac iron for early treatment. Previous studies found that diastolic dysfunction of left ventricle might relate to cardiac iron overload in early stage of disease, but the results were inconclusive. This study aims to find the prevalence of left ventricular (LV) diastolic dysfunction and its correlation with cardiac T2* by cardiac magnetic resonance imaging in thalassemia major patients, with normal LV systolic function, which yields the knowledge about the disease and may lead to early diagnosis of iron overload cardiomyopathy, for early treatment and decrease in mortality and morbidity.

Method: Thalassemia major adult patients (age ≥ 18 years old), who was investigated with cardiac MRI for T2* and diastolic function with normal LV systolic function (LVEF ≥ 57% by cardiac MRI) were included.
Result: There were 123 patients with a mean age of 27.70 ± 13.86 years, and 58% were female. Homozygous beta thalassemia and beta thalassemia hemoglobin E were accounted for 11% and 89%, respectively. The 80% of patients were transfusion dependent thalassemia, mean duration between transfusion was 4.80 ± 3.05 weeks, baseline hematocrit was 26.28 ± 3.26%, and median with interquartile range (IQR, 25^{th} – 75^{th} percentile) of ferritin was 1402.5 (638.5- 2535.25) ng/ml. The prevalence of diastolic dysfunction was 37.4%, cardiac T2* was abnormal (≤ 20 ms) in 4.3 % among this group of patients and 7.3% of the patients in the entire study. There was no correlation between diastolic function and cardiac T2* (p-value = 0.48). Thalassemia type, deferoxamine, beta blockers, hematocrit, and liver iron concentration (LIC) were found univariately associated with cardiac T2*. Multivariate factors associated with cardiac T2* were hematocrit (OR = 1.33, 95% CI = 1.03 – 1.71, p-value = 0.027) and LIC (OR = 1.09, 95% CI = 1.03 – 1.16, p-value = 0.003).

Conclusion: The prevalence of diastolic dysfunction in thalassemia major patients, with normal LV systolic function is 37.4%. No correlation was found between LV diastolic function and cardiac T2*. Hematocrit and LIC were independently associated with cardiac T2*.

Thai Heart Journal

RF 36

Electrocardiographic ventricular conduction delay in patients with left ventricular dysfunction associated with left ventricular volume not septal scar

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Background: Delayed gadolinium enhancement (DGE) cardiac magnetic resonance (CMR) is now becoming the gold standard for evaluation of myocardial scar. The presence of ventricular septal scars which the cardiac conduction pathway is located may lead to the ventricular conduction abnormalities and delay, such as left bundle branch block (LBBB), right bundle branch block (RBBB) or nonspecific intraventricular conduction delay (IVCD). However, the correlation between ventricular conduction delay and septal scar from DGE-CMR in patients with left ventricular (LV) systolic dysfunction is still unknown.

Methods: Patients with LV systolic dysfunction (ejection fraction ≤ 40%) who underwent CMR with DGE study and 12 lead-ECG on the same day were included from cardiac magnetic resonance unit of Siriraj Hospital since January 1, 2015 to December 31, 2016. The demographic data, electrocardiographic findings and ventricular septal scar from DGE-CMR were obtained. The primary outcome was the correlation of ventricular conduction delay (QRS ≥ 120 ms) from 12 lead-ECG and septal scar from DGE-CMR. The secondary outcomes were the correlation of ventricular conduction pattern (LBBB, RBBB or IVCD) and septal scar.

Results: Total of 228 patients were included in our study. Mean age was 66.8 ± 13.4 year-old (male 72.8%, female 27.2%). There were 69 patients (30.3%) with conduction delay and 159 patients (69.7%) without conduction delay. Septal scars were found in 22 of 69 patients (31.9%) with ventricular conduction delay and 49 of 159 patients (30.8%) without ventricular conduction delay (P=0.873). There were no significant correlation between pattern of ventricular conduction delay (LBBB, RBBB or IVCD) and septal scar. However, the ventricular conduction delay was significant associated with increased in LV end diastolic volume (LVEDV; 274.9 vs. 238.8 ml, P=0.001), LV end systolic volume (LVESV; 205.8 vs. 171.9 ml, P<0.001), LV mass index (84.5 vs. 76 g/m2, P=0.016) and also associated with the lower LV ejection fraction (LVEF; 26.2 vs. 29.4 %, P=0.007).

Conclusion: In patients with LV systolic dysfunction, neither the ventricular conduction delay nor pattern of conduction abnormalities were associated with ventricular septal scar. But the cardiac conduction delay was associated with increased LVEDV, LVESV, LV mass index and lower LVEF.

RF 37

Left atrial strain indices by 2D-speckle tracking echocardiography in healthy Thai population:

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Background: A two-dimentional (2D) speckle tracking echocardiography is new promising method for evaluating deformation properties (strain) of left atrium (LA). The derived echocardiographic parameters can be used to represent mechanical function of LA. However, these data are scant in our country. So we sought to establish the normal value of LA strain-related indices in healthy Thai population

Methods: Volunteers were screened and recruited into this study if thorough physical examination and medical history revealed no abnormality. Number of subject was calculated to ensure the validity of data as stratified by age groups and gender. Echocardiogram (Philips IE33, S5 probe) was carefully performed in each subject to obtain complete standard views and echocardiographic parameters as recommended by ASE. To study LA deformation, LA in 4-chamber view was zoomed and then consecutively recorded in 2 clips (2-cardiac cycle each) for further off-line analysis on Excelera echo workstation (QLAB11). LA wall (region of interest) was manually traced from medial to lateral mitral annulus. The software was then executed to perform tracking of echocardiographic speckles. Strain-related data set over one cardiac cycle were obtained and exported as an Excel file in which two curves of strain and strain rate were generated. Maximal values of strain and strain rate during each period of a cardiac cycle were measured as following; systolic strain (Ss) and strain rate (SRs), early diastolic strain (Se) and strain rate (SRe) and late diastolic strain (Sa) and strain rate (SRa) (figure1 and figure2). We exclude subjects with poor quality of echocardiographic image or strain analysis. The study protocol was approved by Thammasat University's Medical Ethic Committee and all subject gave informed consent.

Results: One-hundred subjects were initially screen. Seventy-nine healthy subjects were finally included in the study for final analysis. All conventional echocardiographic parameters of both LV systolic and diastolic function were within normal range when they were compared to standard references. Of note, LV relaxation parameters (E/A, e', E/e') were reduced with age ($p<0.001$ for all).

LA strain parameters of interest (table 2) were stratified by age group of subjects. Deformation of LA during systole (Ss), or LA reservoir property, was progressively lessor when subject was older ($p=0.02$) SRe was also reduced with age ($p<0.001$). This deformation rate of LA during early diastole (SRe) was in similar direction of changes of LV e'.

Conclusion: Our study has shown, for the first time, normal range of important LA strain-related parameters in healthy Thai subjects. However, some of these parameters varied with age. This factor should be considered when measuring LA strain parameters.

Keywords: Left atrial strain. Left atrial strain rate. Speckle tracking. Two-dimentional strain.

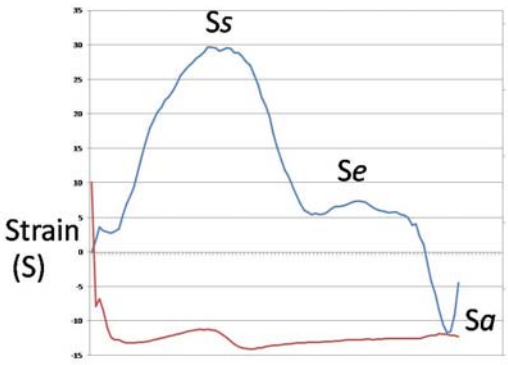

Figure 1: Left atrial strain curve. The first positive peak represent LA strain during systole (Ss), second positive peak represent strain during early diastole (Se) and negative peak represent strain during late diastole (Sa)

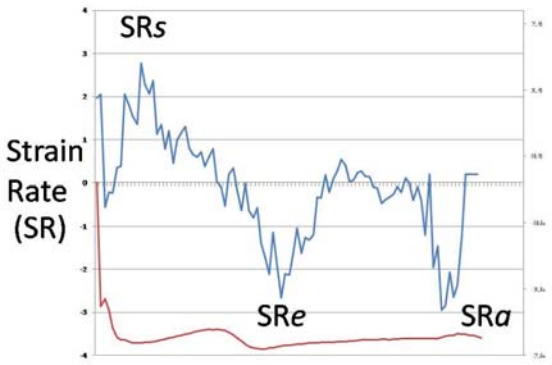

Figure 2: Left atrial strain rate curve. The first positive peak represent LA strain rate during systole (SRs), First negative peak represent strain rate during early diastole (SRe) and second negative peak represent strain rate during late diastole (SRa)

Table 1: Characteristics and 2D echocardiographic parameters of healthy volunteers

Age (year)	All (N= 79)	18-30 (N=19)	31-40 (N=19)	41-50 (N=16)	51-60 (N=20)	> 60 (N=5)	p value
Female (%)	46 (58.2)	10 (52.6)	10 (52.6)	9 (56.3)	13 (65)	4 (80)	
Height (cm)	162.62 ± 8	165 ± 7.2	164.53 ± 7.7	162.69 ± 7.7	159.75 ± 7.6	157.6 ± 8.2	
Weight (kg)	63.16 ± 11.5	65.87 ± 13.4	63.16 ± 10	63.94 ± 11.3	61.75 ± 10.8	56 ± 7.7	
BSA (m2)	1.68 ± 0.2	1.73 ± 0.2	1.71 ± 0.1	1.69 ± 02	1.63 ± 0.1	1.56 ± 0.2	
LVMI (g/m2)	68.68 ± 16	66.04 ± 16.3	69.49 ± 16.1	69.58 ± 18.8	67.92 ± 12.5	75.84 ± 14.2	0.809
EF (%)	62.01 ± 3.8	60.55 ± 2.7	61.47 ± 3.4	63.04 ± 4.8	63.07 ± 4	62.0 ± 1.9	0.218
LVEDVi (ml/m2)	44.42 ± 8.1	47.18 ± 8.6	44.07 ± 7.4	48.10 ± 8.7	40.19 ± 5.6	40.43± 3	0.013
LVESVi (ml/m2)	16.66 ± 3.8	18.66 ± 3.4	16.62 ± 4	17.22 ± 3.4	14.67 ± 3.4	15.35 ± 1.1	0.016
E velocity (cm/s)	84.38 ± 16.6	88.82 ± 18.6	82.47 ± 14.4	87.29 ±18.3	78.68 ± 12.8	90.0 ± 16.3	0.308
A velocity(cm/s)	58.72 ± 15.5	48.58 ± 12.6	49.05 ± 5.7	61.28 ± 13.2	68.5 ± 13	82.72 ± 10.9	<0.001
E/A	1.52 ± 0.4	1.92 ± 0.5	1.69 ± 0.3	1.43 ± 0.2	1.18 ± 0.3	1.08 ± 0.2	<0.001
DT (msec)	184.78 ± 31.1	183.94 ± 27.3	180.89 ± 36.6	183.06 ± 19	189.5 ± 32.9	189.0 ± 40.5	0.929
IVRT (msec)	89.05 ± 17.3	84.39 ± 11.8	89.74 ± 10.6	84.34 ± 25.1	93.89 ± 16.9	99.8 ± 15.1	0.210
e' septal (cm/s)	9.69 ± 1.8	11.38 ± 1.9	10.04 ± 1.5	9.28 ± 1.4	8.32 ± 0.8	8.62 ± 0.5	<0.001
e' lateral (cm/s)	13.29 ± 3.1	16.32 ± 3.3	14.38 ± 2.2	11.76 ± 2	11.14 ± 1.5	10.46 ± 0.9	<0.001
E/e' septal	8.87 ± 2	7.78 ± 1.7	8.28 ± 1.2	9.49 ± 2.6	9.5 ± 1.3	10.52 ± 2.3	0.005
E/e' lateral	6.64 ± 1.9	5.54 ± 1.3	5.83 ± 1.1	7.45 ± 2	7.22 ± 1.4	8.82 ± 2.4	<0.001
LAVI (ml/m2)	25.75 ± 5.6	24.24 ± 5.5	24.53 ± 4.7	27.0 ± 5.9	26.24 ± 5.5	30.24 ± 5.1	0.173
PVs (cm/s)	54.61 ± 10.7	51.18 ± 10.7	54.29 ± 10.2	56.96 ± 13.7	55.19 ± 8	61.1 ± 5.4	0.437
PVe (cm/s)	49.8 ± 9.8	55.8 ± 11	49.51 ± 6.8	52.04 ± 8.9	43.03 ± 7.6	47.65 ± 7.4	0.003
PVa (cm/s)	25.4 ± 4.2	22.77 ± 3.9	24.18 ± 3.8	26.45 ± 4.7	27.08 ± 3.4	29.08 ± 1	0.009

BSA; body surface area. LVMI; left ventricular (LV) mass index. EF; Ejection fraction. LVEDVi; LV end diastolic volume index. LVESVi; LV end systolic volume index. E velocity; transmitral velocity during early diastole. A velocity; transmitral velocity during late diastole. DT; deceleration time of E velocity. IVRT; isovolumic relaxation time. e' septal; tissue Doppler velocity (TDI) at septal mitral annulus. e' lateral; TDI at lateral mitral annulus. LAVI; LA volume index. PVs, PVe and PVa; pulmonary vein flow velocities during systole, early diastole and late diastole respectively.

Table 2: Parameters of Left atrial strain and strain rate among age groups.

Age (year)	All (N= 79)	18-30 (N=19)	31-40 (N=19)	41-50 (N=16)	51-60 (N=20)	> 60 (N=5)	p value
Ss (%)	29.84 ± 6.5	33.73 ± 6.7	28.37 ± 5.4	29.64 ± 6.5	28.99 ± 5.9	24.62 ± 4.4	0.020
Se (%)	9.65 ± 4.1	8.88 ± 3.5	8.63 ± 3.5	9.58 ± 3.9	11.71 ± 4.8	8.45 ± 2	0.117
Sa (%)	-4.03 ± 4.1	-5.0 ± 4.3	-4.22 ± 4.1	-3.43 ± 3	-3.77 ± 4.6	-2.58 ± 2.6	0.712
SRs (1/s)	2.15 ± 0.5	2.26 ± 0.6	2.06 ± 0.4	2.11 ± 0.3	2.23 ± 0.6	1.82 ± 0.6	0.445
SRe (1/s)	-2.75 ± 0.7	-3.5 ± 0.7	-2.73 ± 0.6	-2.57 ± 0.5	-2.33 ± 0.5	-2.17 ± 0.3	<0.001
SRa (1/s)	-2.29 ± 0.7	-2.36 ± 0.9	-2.08 ± 0.7	-2.17 ± 0.4	-2.62 ± 0.7	-1.87 ± 0.4	0.092

Ss, Se, Sa; LA strain during systole, early diastole and late diastole, respectively.
SRs, SRe, SRa; LA strain rate during systole, early diastole and late diastole, respectively

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Prevalence of staphylococcus aureus nasal carriage among patients undergoing elective cardiac surgery

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Background: Preoperative screening and treatment of nasal carriers of Staphylococcus aureus is recommended in patients undergoing cardiac surgery to reduce surgical site infection. However, it is not a common practice in Thailand due to the presumably low prevalence of Staphylococcus aureus nasal carriage in Thai patients. Therefore, we aimed to study the prevalence of Staphylococcus aureus nasal carriage in Thai patients undergoing elective cardiac surgery.

Methods: This is a prospective observational study of 102 patients who planned to undergo elective cardiac surgery. Nasal swab culture was done in all volunteers patients preoperatively. Postoperative surgical site infection was evaluated during index hospitalization and at 1 month after surgery. Primary outcome was the prevalence of Staphylococcus aureus nasal carriage. Secondary outcome was the association between Staphylococcus aureus nasal carriage and surgical site infection.

Results: Of 102 patients, 14 (13.7%) nasal swab culture was positive for Staphylococcus aureus. Methicillin-susceptible strains were found in 13 (92%) patients, whereas one patient harbored methicillin-resistant strain. There was no association of Staphylococcus aureus nasal carriages with any specific patient demographics. The incidence of surgical site infection was 2.9%. The surgical site infection occurred in one of 14 (7.1%) Staphylococcus aureus nasal carriages, while it occurred in two of 88 non-carriers (2.3%) (P=0.316).

Conclusions: Prevalence of Staphylococcus aureus nasal carriage in Thai patients undergoing cardiac surgery is not low. Preoperative screening and treatment of nasal carriers of Staphylococcus aureus should be encouraged in this group of patients.

RF 39

Mobile phone text messages to support treatment adherence and focus in intensive lifestyle modification in cardiac outpatient department

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Background: To evaluate the effects of a lifestyle intervention including short message system(SMS), health media in cardiovascular unit to support the treatment adherence, physical activity, and quality of life.

Method: A randomized controlled trial, carried out in an outpatient cardiovascular unit , faculty of medicine Vajira hospital, Navamindradhiraj university. A total of 320 outpatients cardiovascular unit were enrolled and randomly allocated in 1:1 ratio to SMS-Adherence and not SMS-Adherence(Usual care). Analyses were intention to treat. The primary outcome was the satisfaction included quality of life in 1 and 3 months. The secondary outcomes were changes in office blood pressure, hip and waist circumference, body mass index and metabolic variables such as lipid profile, fasting blood sugar with HbA1C. The study period was between November 2016 to March 2017.

Interventions: Short message system(SMS) and health media randomly sent weekly in the SMS-Adherence group along 1 and 3 months. Follow-up meeting with a monthly thereafter adhere to focus on life style modification.

Result: In this randomized controlled trial of mobile phone text message to support treatment adherence and focus in life style modification in a general outpatient population. We found that our interventions were significantly satisfying and trend to significant in secondary outcome.

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Algorithm for diagnosing tuberculous pericardial effusion in Maharat Nakhonratchasima hospital

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Objective: To develop an algorithm for the diagnosis of tuberculous pericardial effusion.

Background: Tuberculous pericardial effusion is a rare extra-pulmonary TB presentation with serious short and long term complications. It is also associated with high mortality rates especially when diagnosis and treatment is delayed.

Method: A retrospective cross-sectional study of patients who underwent pericardiocenthesis was conducted to develop an algorithm for the diagnosis of tuberculous pericardial effusion.

Result: Of the 125 consecutive patients (mean ± SD age, 55.7 ± 18.1 years, male 48.8%), 41 (32.8%) patients was diagnosed tuberculous pericardial effusion. The ADA level ≥ 35 U/L was detected in 44(35.2%)patients. The sensitivity and specificity of ADA level ≥ 35 U/L for diagnosing tuberculous pericardial effusion was 81.1% and 80.3% respectively. When using ADA level ≥ 35 U/L in the algorithm for diagnosing TB pericardial effusion, the sensitivity and the specificity improved.

Conclusion: There was no definite cut point ADA levels in diagnosing tuberculous pericardial effusions.Using pericardial effusion ADA level ≥ 35 U/L resulted in favorable sensitivity and specificity rates for diagnosis of tuberculous pericarditis. When applied to the algorithm, sensitivity and specificity for diagnosis of tuberculous pericardial effusion is increased.

Keywords: Diagnosing of Tuberculous pericardial effusion • Adenosine deaminase (ADA) activity

RF 41

Prediction of non-viable myocardium by ECG Q wave area: A 3.0 T cardiovascular magnetic resonance study

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Objective: This study tested a novel ECG approach. We purpose that, pathologic Q-wave area was predicted transmural extent and scar size.

Background: The criteria for pathological Q waves was used by Third Universal Definition of Myocardial Infarction. The myocardial infarction size was quantified by delayed enhancement cardiac magnetic resonance (DE-CMR).

Methods: Standard 12-lead electrocardiograms (ECG) were recorded in 249 patients who were suspected myocardial infarction. ECG was recorded 1 mouth after acute myocardial infarction. An ECG was recored as Q-wave MI when it showed Q waves in 2 or more contiguous leads. Cardiac magnetic resonance (CMR) examination was performed at the same time of ECG record.

Results: 77 patients showed Q wave in ECG. Q wave area was associated with transmural extent (AUC=0.755 (95%CI: 0.617-0.894), p-value=0.019). When we divide ECG by vascular territory: LAD, RCA and LCX. Q wave area showed association with transmural extent at LAD (AUC=0.823 (95%CI: 0.727-0.919), p-value<0.001) and RCA (AUC=0.735 (95%CI: 0.560-0.910), p-value=0.017) but it was not showed in LCX territory. Furthermore, Q wave area was associated with 10% total scar size.

Conclusions: Q wave area provides an index for stratification of transmural extent and scar size when compared with delayed enhancement cardiac magnetic resonance.

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Incidence and risk factors of cardiovascular diseases among HIV patients in Thailand

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Background: The life expectancy of HIV-infected individuals continues to rise, due to the current effective antiretroviral therapy (ART). ART greatly reduces the mortality and morbidity of the patients, however, the major adverse effects of ART are related to abnormal metabolic changes including hyperglycemia and hyperlipidemia, which sometimes leading to the metabolic diseases e.g. diabetes mellitus. Taken together with the systemic inflammatory states from HIV infection, the HIV-infected patients are now at the greater risk to develop the cardiovascular diseases in their lifetimes.

Objective: The study aimed to review the incidence of cardiovascular diseases in HIV-infected patients in Thailand and their possible risk factors, which could eventually lead to establish more effective preventive managements.

Materials and method: All HIV-infected patients, aged ≥ 18 years, who presented at either King Chulalongkorn Memorial Hospital or The HIV Netherlands and Australia Thailand research(HIV-NAT) before December 2010 were included in the study. The incidence of cardiovascular diseases during 5-year follow-up and the possible risk factors were studied.

Results: 1,813 HIV-infected patients were included in the study. The incidence of cardiovascular disease was 1.9 % in 5 years. Major cardiovascular risk factors in HIV-infected patients include diabetes mellitus (OR= 4.27 (95%CI = 1.67-10.9)), dyslipidemia (OR= 4.09 (95%CI = 1.7-9.83)), previous cerebrovascular diseases (OR= 34.69 (95%CI = 5.1-233.45)) and a family history of cardiovascular disease (OR = 6.89, (95%CI = 2.5-18.48)).

Conclusion: Incidence of cardiovascular diseases in Thai HIV-infected patients was similar to other developed countries. Most of cardiovascular risk factors in HIV-infected patients are also common in non-HIV-infected patients, however, they are possible related to the metabolic adverse effects of the antiretroviral therapy.

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Effect of paeka capsule® on serum LDL-cholesterol in Thai patient with hyper-LDL cholesterolemia

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Background: Oroxylum indicum, the main ingredients of Paeka capsule®, has been found to lower serum LDL-Cholesterol level in vitro study. Our study aims to determine the effect of Paeka capsule® on serum LDL-Cholesterol level in Thai patients with hyper LDL cholesterolemia compared to placebo control.

Methods: We conducted a randomized, double-blind clinical trial in 40 patients with serum LDL-cholesterol level between 130 – 190 mg/dL. The patients were received either Paeka capsule® 3.6 g/day or placebo capsule. The follow up period was 6 weeks and serum lipid profiles were measured in all patients at first and last visit.

Results: The baseline clinical parameters were comparable in both intervention and control groups. The mean serum LDL-cholesterol level changed from 153.80±15.92 mg/dL to 146.80±23.23 mg/dL (-7.00±16.79 mg/dL) in Paeka capsule group and from 157.35±19.96 mg/dL to 160.20±22.45 mg/dL (+2.85±13.82 mg/dL) in placebo group. The mean changes in serum LDL-Cholesterol level were statistically significant difference between two groups ($p<0.05$) but change of serum total cholesterol, HDL-cholesterol and triglyceride levels were not. No significant side effects were observed in both groups.

Conclusion: Taking Paeka capsule® 3.6 g/day for 6 weeks may reduce serum LDL-cholesterol level in Thai patients with hyper LDL-cholesterolemia without side effect. Long-term and larger randomized controlled trials are needed to elucidate the efficacy and safety of this new LDL-cholesterol lowering herb.

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All Moderators

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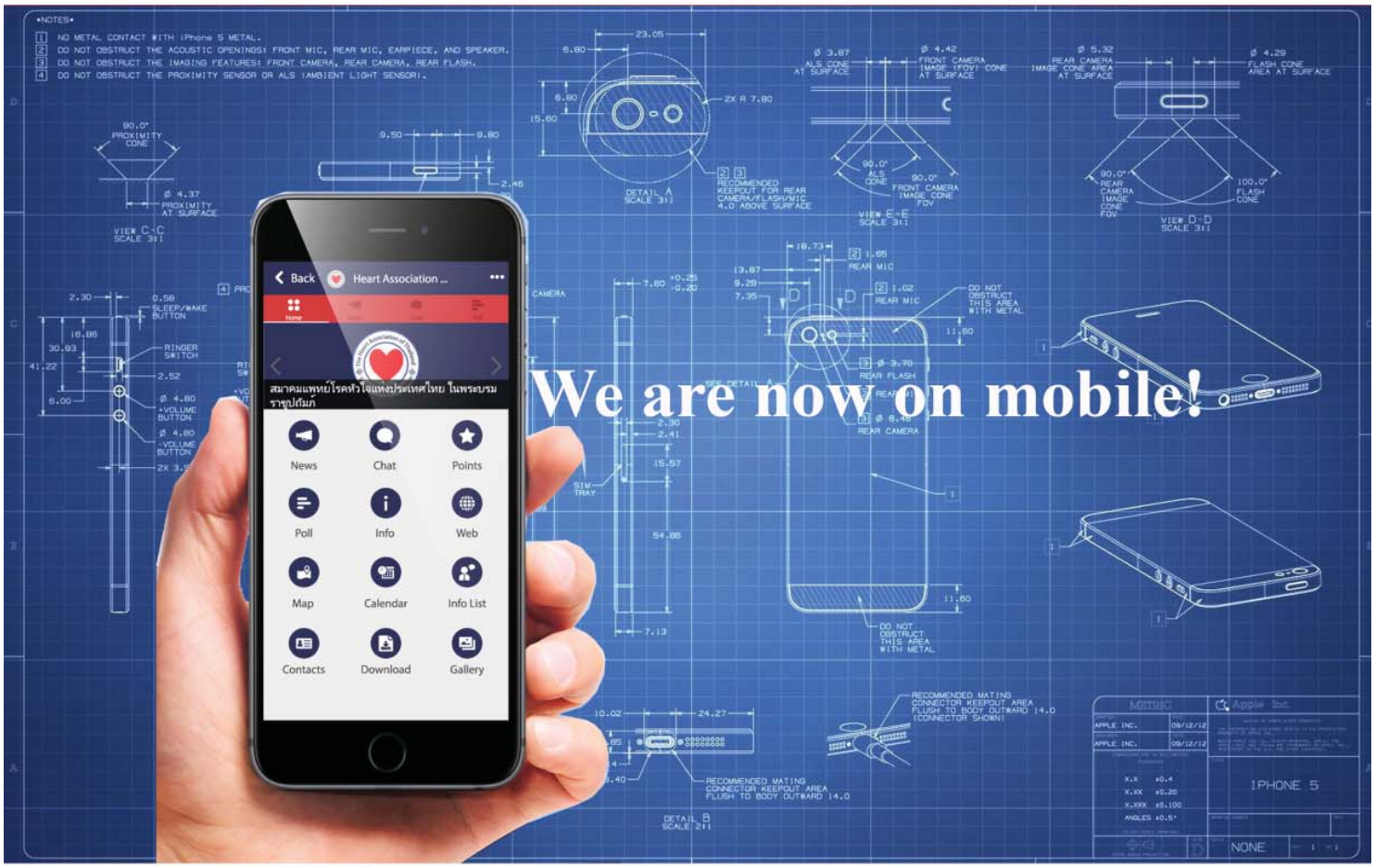

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