Cardiac Catheterization & Intervention in Malaysia

Nik Zainal 1942 - 2007
Nik Zainal Memorial Lecture

Development of Cardiology in Malaysia

NHAM Scientific Meeting 2010
9th April 2010 08:00 – 08:25

Robaayah Zambahari  FRCP, FACC, FAPSIC, FNHAM, FASCC
Institut Jantung Negara (National Heart Institute), Kuala Lumpur, Malaysia
‘68: University Hospital was opened

\[ 1^{st} \text{ cath lab in Malaysia [Wong Hee Ong]} \]
Right Heart Catheterization and Aortograms

\[ 1^{st} \text{ cardiac surgeon in University Hospital [Yong Nen Khiong]} \]
PDA ligation, mitral valvotomies

\~ 70s: started open heart surgery; ASDs later VSDs.

N K Yong
Ward Kennedy’s came 2xs: to UH from the University of Washington ‘71 – ’72: 1 year, clinical teaching and worked together with cath lab team, particularly in trans septal puncture for left heart studies.

1990: 3 months as visiting professor

ACC website In Memorium: J. Ward Kennedy, MD, MADD ……..’ in 1972, while on sabbatical in Kuala Lumpur, Malaysia, Dr. Kennedy helped establish the first cardiac unit and performed the first heart catheterization in that country’
1977: Division of Cardiology, Medical Department, General Hospital, Kuala Lumpur

1984: General Hospital Cardiology & Cardiothoracic Surgery Clinic
1992: Institut Jantung Negara IJN

September 2009
The beginnings

70’s: PDA ligation in Lady Templer Hospital
Closed Mitral Valvotomy via lateral thoracotomy
Surgeon: McGladdery Yeang

70’s: Open Heart Surgery in Philippines Heart Centre
Sponsored by BAKTI
‘77: Dr Nik Zainal started Cardiology division within Medical Unit 3, headed by Rahim Omar

~ ’80: Department of Cardiology

~ 82 Dr Nik Zainal with Dr Rozali Wathooth and Dr Radhakrishnan set up Department of Cardiology, Department of Cardiothoracic Surgery.

Early ’82: Cardiac catheterization and coronary angiography in Hospital Kuala Lumpur

April ’82: First open heart surgery in HKL, closure of Atrial Septal Defect.

Sept ’82: First Coronary Artery Bypass Graft Surgery CABGS in Malaysia
From then on, continued to grow

I came back 3rd quarter of ’82

Cardiac catheterization: Brachial cutdown to percutaneous femoral.
Paediatric catheterization via femoral cutdown.
Pre-2D echo, numerous cases need diagnostic catheterization; all cases for cardiac surgery underwent catheterization.

~ ’84: Dr Yahya Awang came back.
Mid ‘85: Dr Rozali Wathooth left government service.
~ ’84: Dr Nik Zainal left government service to set up KL Heart Centre in Tawakal Hospital

Apr ’84 – ‘91: Dr Shahrom Ujang,
June ‘84: Dr Dewi Ramasamy
’85: Dr Zainal Hamid
’89: Dr Ahmad Murtazam
Coronary Heart Disease

Valvular Heart Disease

Electrophysiology / RFA / Pacing / ICD / Resynchronization

Congenital Heart Disease / Other Structural Cardiac AbN

Heart Failure / Heart Transplantation

Peripheral Vascular Interventions & Aortic Aneurysm Repair

Clinical practice Guidelines
(Early) Centres providing tertiary care in Cardiology & Cardiothoracic surgery:

1) The Lady Templer Hospital, Kuala Lumpur,
   Closed heart surgery - ligation of PDA
   - closed mitral valvotomy

2) The University Hospital, Kuala Lumpur

3) The Cardiology Unit [‘77] → Department [‘81] [Nik Zainal]
   Cardiology/Cardiothoracic/Cardiac Anaesthesia Depts of GHKL ‘82 [Nik Zainal/Rozali Wathooth/Radhakrishnan]
   → Institut Jantung Negara (IJN) in June 1992

4) The Subang Jaya Medical Centre, Subang Jaya

5) The Pantai Medical Centre, Kuala Lumpur

6) The Adventist Hospital, Penang
Coronary Heart Disease

Revascularization:

- CABGs – first in Sept ’82
- PCI – first in ’84 UH, [Singham, Masduki]

- ‘lull’ period till ’88
  ’88 [Stertzer/Walton/ RZ/ Jeyamalar/ Kanan]
  ’89 [D Clarke/ RZ/Jeyamalar/Kanan/ S C Ng]
Rotational Atherectomy (RA)

advancer

console

burr

1st PTCRA: 1991

Dr Simon Stertzer
Centres w Cardiology and Cardiac Surgery Services
Nov 2007
### Malaysia: Cardiac Services w Invasive Cardiology

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Coronary Heart Disease

Diagnostic Tools:

► Masters step test – ’60s
► Treadmill exercise test – ‘70s
► Radionuclear perfusion scan – ‘80s, (limited availability)
► Stress echocardiography – 1992
► Coronary Angiography – 1982
► CT Angiography –
  16 slice CT angiogram’03 HSC Centre
  64 slice CT angiogram ’05 Health Scan
  Dual source CT angiogram (DSCT) Apr ’07 IJN

Cardiac Magnetic Resonance CMR, Annuar Rapee
Dual source CT angiogram (DSCT) April ’07
IJN

[David Chew SP]
Radionuclear Perfusion Scan
1st established in University Hospital ~ 1978, [Dr Paramjothi]

IJN: Dedicated cardiac Gamma Camera – VENTRI : Aug 2007
[Dr Rosli Mohd Ali, Sulaiman Tamanang, Ahmad Khairuddin]
Coronary Heart Disease: Revascularization

**PCI** – first in ’84 UH, ‘lull’ period till ’87
- Stenting—first in’92 Palmaz-Schartz[J&J]–SJMC, Ng Swee Choon
- DES – SES [J&J]30th May ’02, Robaayah Zambahari
- PES [Boston Sc] 3rd Mar ’03, Robaayah Zambahari
- Pro-Healing *Genous* stent ’05 David Chew, Stefan Verheve

- Rotational Atherectomy – 1991 [Simon Stertzer / RZ]
- Directional Atherectomy – ’02 [Robaayah Zambahari]

- Cutting Balloon – ‘01
- Fx Minirail → Safecut – ‘03
- Drug-Eluting Balloon (DEB) – ’07, part of Clinical Trial [Rosli Ali]

- Transradial coronary angio / PCI – ’97 [Saito/Zainal Hamid/Nasir Muda]
- Primary / Rescue PCI – ‘95 [Zainal Hamid]
Valvular Heart Disease

Percutaneous Mitral Valve Dilatation:

- Balloon dilatation
  - ’88 UH [J Murray/ Kannan]

- Inoue balloon
  - ’89 GHKL [J S Hung/Robaayah Zambahari/ Dewi Ramasamy]

- Metallic Overture device
  - ’00 UH [Cribier / Wan Azman Wan Ahmad]

- Real-time 3D TEE-guided PTMC by Inoue technique
  - Aug ’07 [Robaayah Zambahari / Rahal Yusoff]
Valvular Heart Disease

Percutaneous Aortic Valve Implantation:

Transcatheter Aortic Valve Implantation TAVI
Echo / TEE guidance: Syahidah Tamin]

CoreValve procedure
Electrophysiology / RFA & Pacing / ICD / Resynchronization Therapy:

Electrophysiology Study:

’90 GHKL [Ahmad Murtazam]

Radiofrequency Ablation (RFA)
for AVNRT ’92 [Ahmad Murtazam / Ahmad Nizar]

Radiofrequency Ablation (RFA)
for Atrial Flutter ’96/97 [Razali Omar]

Focal Pulmonary vein ablation / Pulmonary Vein isolation
for Paroxymal Atrial Fibrillation
‘99 [Razali Omar/ Azlan Husin]

Advances in mapping – Endocardial Solutions Integrated (ESI), a virtual non-contact mapping system capable of mapping complex, usually multicirculatory arrhythmias
’00 IJN [Razali Omar/ Azlan Husin]
Electrophysiology / RFA & Pacing / ICD / Resynchronization Therapy:

**ICD:** Aug ’96 IJN [Razali Omar / Azhari Rosman]

**Resynchronization Therapy,** for heart failure patients with electromechanical dysynchrony

June ’01 IJN [Razali Omar / Azlan Husin]
Congenital Heart Disease / Other Structural Cardiac Abnormalities:

- Paediatric Cardiology became a subspeciality in 1996. Since then advances esp in catheter-based therapy:

  - **Balloon Atrial Septostomy** for TGA ’85 GHKL [*KC Chan*]
  - **Balloon Dilatation of Pulmonary Valve** for severe Pulmonary Stenosis ’87 GHKL [*KC Chan*]
  - **Balloon Dilatation for Valvular Aortic Stenosis** ’92, Coartation / Recoarctation ‘90 [*Mazeni Alwi*]
Amplatzer Occluder Devices
Congenital Heart Disease / Other Structural Cardiac Abnormalities:

- PDA percutaneous closure with Rashkind double-umbrella device ’92
- PDA percutaneous closure with coils ’94
- PDA percutaneous closure with Amplatzer Duct Occluder, ADO ’97

- ASD percutaneous closure with Atrial Septal Defect Occluder, ASO ’97

- Radiofrequency Ablation of Pulmonary Atresia ’92

- Coil Embolization of CA fistula (Cook coils) ‘94

- VSD percutaneous closure [’97 device done in OT] ‘01

- PDA stenting for duct-dependent cyanotic heart disease ’01

- Real-time 3D TEE-guided ASD closure Aug ’07 [Robaayah Zambahari / Rahal Yusoff / Mazeni Alwi]
Peripheral Vascular Interventions & Aortic Aneurysm Stenting:

Renal Artery Intervention
Balloon dilatation for renal Artery Stenosis
’95 IJN [Dewi Ramasamy]
Renal Artery Stenting
’97 IJN [Rosli Mohd Ali]

Carotid Artery Stenting for carotid artery stenosis
’99 IJN [Rosli Mohd Ali / RZ]

Iliac / Aorto-iliac Stenting
’94 IJN [Rosli Mohd Ali / RZ]

AAA stenting – 1st in Msia by vascular surgeon
’01 IJN [Rosli Mohd Ali / RZ]
Others & Miscellaneous

- **Vena Cava Filter**
  - Early ‘90s [Samad Sakijan]
  - ’94 IJN [Dewi Ramasamy/Rosli Mohd Ali]

- **Coronary Artery Fistulae**
  - Coil Embolization of CA fistula (Cook coils)
  - ‘94 IJN [Mazen Alwi/Lim MK/Qureshi/Reidy]

- **HOCM**
  - Surgical Excision
    - ’98 IJN [Azhari Yakub / Jeswant Dillon]
  - Trans catheter Alcohol Septal Ablation
    - ‘99 IJN [Razali Omar]
1996: First implantable cardiac defibrillator ICD implant, 1st in Malaysia
Congenital Heart Disease / Other Structural Cardiac Abnormalities:

1992: 1st closure of hole-in-heart without surgery

PDA percutaneous closure
  - 1992: with Rashkind double-umbrella device
  - 1994: with coils ’94
  - 1997: with Amplatzer Duct Occluder, ADO

1st in Asia

Amplatzer Duct Occluder
Congenital Heart Disease / Other Structural Cardiac Abnormalities:

**PDA percutaneous closure**
- 1992: with Rashkind double-umbrella device
- 1994: with coils ’94
- 1997: with Amplatzer Duct Occluder, ADO

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</table>
1997: ASD percutaneous closure with Atrial Septal Defect Occluder ASO

1st closure of another type of hole-in-heart without surgery in Asia

Up to March '13
1322
2000

1st device treatment for Heart Failure in Malaysia

1st in Malaysia: Cardiac Resynchronization Therapy (CRT) [Biventricular pacing] for heart failure

- Introduction of Embolic protection device
- 1st in Malaysia Advanced Non-Contact Mapping System (ESI) Radiofrequency Catheter Ablation

Cardiac Resynchronization Therapy

- 1999: First Cardiac Resynchronization Therapy CRT 1st in ASEAN

- 2006 1st LIVE Course (Workshop with training of Asia Pacific Physicians) Continue 6 times a year till present.
2001

1st non-surgical Repair of swollen abdominal aorta

2001

- 1st Endovascular Aortic Aneurysm Repair (EVAAR)
IJN shows new way to cut risk of stroke

By Annie Freeda Cruz
annief@nst.com.my

KUALA LUMPUR: A National Heart Institute (IJN) team implanted a stroke prevention device in two patients with atrial fibrillation (AF), the first in Malaysia.

The device, which has a self-expanding nitinol frame with a membrane on the proximal face, is permanently implanted in the LAA.

Dr Razali said the device was for patients with AF who required blood-thinning medications to reduce the risk of stroke.

The two patients were men, aged 69 and 72. They will be discharged in March, he said.

There have been 22 successful implantations at the institute so far.

Razali said the first case was performed on 21 July 2010 at the institute.

Up to March ‘13

60

Largest per centre in AsiaPacific
Non-surgical Implantation of prosthetic heart valve
TAVI - 25th Nov ‘09

Up to March ‘13:
26

1st in Asia to do CoreValve TAVI
Implanted a new Absorbable scaffold, BIORESORBABLE VASCULAR SCAFFOLD (BVS) - 12 FEB 2011

1st in ASEAN

Kuala Kumpur: The National Heart Institute (IJN) has become the first center in the country and in Southeast Asia to successfully implant a new stent device in a 62-year-old man.
Device treatment for difficult-to-treat High Blood Pressure – 15

Sept 2011

Tension gone for good

By Punitha Kumar

KUALA LUMPUR: A new catheter-based procedure to treat resistant hypertension, said to be the first in Asia, was unveiled by the National Heart Institute (NIH) yesterday.

The radio frequency current produced by radio waves to heat nerve fibres located procedure was used on six patients with high blood pressure who had been on three or more anti-hypertension drugs. The procedure lasted about 45 minutes.

NIH chief executive officer Tan Sri Dr Robaayah Zambahari said the treatment blocked overactive nerve fibres and permanently lowered blood pressure.

“A renal denervation (disruption of the nerve connection to an organ) is performed in which nerves along the renal artery of both kidneys are selected and disabled in the sympathetic nerve system,” she said.

NIH consultant cardiologist and electrophysiologist Dr Azlan Hussin said a catheter (tube) was inserted into the renal artery from a puncture

\textit{modified the points.}

Dr Azlan said the six patients tested last Wednesday were all above the age of 70 and diabetic.

“This procedure is in its infancy and a team of experts is tracking its developments for potential uses in other diseases as well,”

Cyberjaya University College of Health Sciences (CUHS) professor Dr Abdul Rahman said patients may undergo a strict selection process.

A Facebook page on the NIH e-clinic has been created for the public to understand the importance of blood pressure control and queries can be answered by NIH staff.

In the past, the standard treatment for hypertension was based on a combination of medications to help reduce blood pressure, including a

- **1st in Asia**
- **First in Asia**
- **6 cases on 15th Sept 2011**
- **IJNF funded devices and equipment for procedure & Resistant Hypertension Clinic**

Up to March ‘13:

18
Non-surgical treatment of leaking Mitral Valve – 14 Dec 2011

‘Clip away’ heart ops blues

NON-SURGICAL TECHNIQUE: New procedure to treat leaking valves a boon for patients

HEART patients can now ‘clip’ their leaking valves instead of going through major surgery involving the vital organ.

The National Heart Institute (IHN) yesterday announced a new technique to treat coronary heart disease (CHD) using a device called the Mitra-clip.

It’s chief executive officer, Tan Sri Dr Robaayah Zambahari, said that CHD (also known as heart valve disease) occurs when one or more of the heart valves do not work well.

“Basically, the heart has four valves: the tricuspid, pulmonary, mitral and aortic valves. Mitral valve is one of the most important valves as it separates the left atrium from the left ventricle, which ensures that the blood flows in only one direction.

However, for patients with Mitral valve regurgitation, their heart valve does not close tightly, which causes blood to leak back into the chamber rather than flowing forward through the heart or artery,” she said at a press conference.

MITRACLIP

14th -20th Dec 2011: 7 cases
Up to May ‘13: 23 cases
Parachute Ventricular Partitioning Device
27th – 28th August 2013

PARACHUTE

1st in Asia Pacific

The Star pg 22 Nation 31 August 2013

Life-saving gadget: The Parachute Ventricular Partitioning Device is not only said to help improve patients’ lives but also reduce healthcare spending for the treatment of heart failure patients.
NHAM and APSIC

2004 - 2006: Presidency APSIC
2004: Live Transmission KL to Euro PCR

Tiang Soon Wee
Live Transmission to Sendai, CVIT Meeting, 23rd Aug 2010
NHAM and APSIC

2004 - 2006: Presidency APSIC
2004: Live Transmission KL to Euro PCR
2005: APSIC at SCAI, Jacksonville, Florida
2005: APSIC at Euro PCR
2004 - 2006: Presidency APSIC
2004: Live Transmission KL to Euro PCR
2005: APSIC at Euro PCR
2005: APSIC at SCAI, Jacksonville, Florida
2006: Fellowship APSIC, FAPSIC, at 2006 AICT, New Delhi
4th AICT, Bangkok
NHAM and ACC

2007: 1st of President ACC @ NHAM scientific meeting
  Dr Jim Dove
2008: Dr Douglas Weaver
2009: Dr Alfred Bove
2010: Dr Ralph Brindis
2009: NHAM – Chapter of ACC

Dr Ward Kennedy
1980s Dr Elliot Corday
Dr Kenneth Kent
Dr Hartzel Schaff
Dr Joe Walton
Dr David Clark
Dr Simon Stertzer
1990s Dr Spencer King
Dr David Holmes
National Heart Association of Malaysia

2007: 1st of President ACC @ NHAM scientific meeting
   Dr Jim Dove
2008: Dr Douglas Weaver
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National Heart Association of Malaysia

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2009: Dr Alfred Bove
2010: Dr Ralph Brindis
2009: NHAM – Chapter of ACC
2010: NHAM @ ACC
Joint Session of the Malaysian Heart Association and the American College of Cardiology: The Mitral Valve

Monday, March 15, 2010

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<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker, Location</th>
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<td>1:00</td>
<td>Mitral Valve Surgery</td>
<td>Azahari Yatub, Kuala Lumpur, Malaysia</td>
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<td>Learning objective: Gain further insight into the recent advances and innovations made in mitral valve repair in Asia, in particular mitral valve repair in chronic rheumatic valves.</td>
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<td>1:15</td>
<td>Mitral Valve Surgery: The U.S. Perspective</td>
<td>Steven F. Bolling, Ann Arbor, MI</td>
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<td>Learning objective: Mitral valve repair in the United States.</td>
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<td>1:30</td>
<td>Questions and Answers</td>
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<td>1:35</td>
<td>Conclusion: New Insights Gained from the Malaysian Heart Association Experience</td>
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Joint Session: Malaysian Heart Association and American College of Cardiology
NHAM and ESC

2008: 1st of President ESC @ NHAM scientific meeting
Dr Kim Fox

2008: affiliated National Society of ESC

2010: President: Roberto Ferrari
National Heart Association of Malaysia

1st Fellowship National Heart Association of Malaysia FNHAM Convocation

President ACC

President s NHAM

President ESC

President SCS
2nd Convocation of Fellowship of NHAM
3rd Convocation of Fellowship of NHAM
National Heart Association of Malaysia

25th Oct 2009: Official Opening of Heart House

‘Soft” Opening of Heart House
Opening Ceremony
of
NHAM Heart House

Officiated by
Y.B. Dato’ Sri Liow Tiong Lai
Minister of Health Malaysia

25th October 2009
Official Launching of Heart House
25th Oct 2009
Official Launching of Heart House
25th Oct 2009
Official Launching of Heart House
25th Oct 2009
NHAM hosts APCC 2011

18th Asian Pacific Congress of Cardiology

May 5-8, 2011
Kuala Lumpur Convention Centre
Clinical Practice Guidelines
Clinical Practice Guidelines
Launching of Clinical Practice Guidelines at NHAM scientific meeting on 4th April 2008
Launching of CPG at NHAM scientific meeting 2009
Clinical Practice Guidelines

Now working on:

- CPG on Management of Stable Angina
- CPG on UA / NSTEMI 2nd Edition
- CPG on Primary Prevention of CVD
- CPG on Management of Dyslipidaemia 4th Edition
Training
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Nik Zainal Memorial Lecture

Nik Zainal 1942 - 2007
Joe Eravelly, Khoo Kah Lin ,David Quek, Arumugam, Dewi, Zainal, Annuar Masduki, Kenneth Chin, Swee Choon.

Sim, Wai kiat, Hendrick, Suren, Rosli, Azhari, Wan Azman, Razali, Azlan, Azani

Amin, Wai Kiat, Choo, Tiang, Imran, Shaiful, Oteh, Anuar Rapaee, Zulkurnai, Haizal, Nik Halmey, Liew Huang Bang, Alan Fong, Syahidah, Rahal, Al Fazir, Sri Ranga, Mahmood, Sahrul, Lau,
Thank you