50 Years of Lancaster Cardiology
1965-2015

Mark W. Burlingame, MD
Neil R. Clark, MD
William D. McCann, MD
John P. Slovak, MD
Nikitas J. Zervanos, MD - moderator

April 21, 2016
Lancaster County History Campus
50 years of Lancaster Cardiology: 1965-2015

PHYSICIANS

ELECTROCARDIOGRAMs

CONSTANT CARE UNIT

CODE BLUE/MAX CART

MOBILE CORONARY CARE

SUMMARY/ACKNOWLEDGEMENTS
50 Years of Cardiology in Lancaster County

John P. Slovak, MD
The Heart Group of Lancaster General Health

April 21, 2016
Lancaster County History Campus
First Cardiac Catheterization

Dr. Richard Mann

Coronary Angiogram

Dr. John Esbenshade
First Dedicated Cardiac Catheterization Lab

LGH Cath Lab, 1980
First PTCA

PTCA Catheter

Andreas Gruentzig

Dr. James Gault
Atherectomy Era

Rotoblation Catheter

Directed Coronary Atherectomy Catheter (DCA)

Coronary Laser Catheter
First Stent

Dr. Rolf Andersen

Coronary Stent
Initial Structural Intervention Era

Dr. Paul Casale

Dr. Richard Gentzler
Treatment of Acute MI

Fibrinolysis (1980s)

Primary PTCA (1990s)

Primary Stenting (2000s)

Dr. Seth Worley – Code R
New Structural Intervention Era

Dr. James Harvey
Dr. Rupal Dumasia

Hybrid Operating Room
Future
50 Years of Noninvasive Cardiology in Lancaster

Neil R Clark, MD
Noninvasive Cardiology

• Imaging of the cardiac system without invasion of the vascular system
Noninvasive Cardiology

• Imaging of the cardiac system without invasion of the vascular system
• Explosion of technology over the last fifty years
Noninvasive Cardiology

- Imaging of the cardiac system without invasion of the vascular system
- Explosion of technology over the last fifty years
- Digital technology and micro processing has led to incredible advances
Noninvasive Cardiology

- Imaging of the cardiac system without invasion of the vascular system
- Explosion of technology over the last fifty years
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- Nuclear Imaging
Noninvasive Cardiology

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• Nuclear Imaging
• Echocardiography
Noninvasive Cardiology

- Imaging of the cardiac system without invasion of the vascular system
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- Nuclear Imaging
- Echocardiography
- CT Imaging
Noninvasive Cardiology

- Imaging of the cardiac system without invasion of the vascular system
- Explosion of technology over the last fifty years
- Digital technology and micro processing has led to incredible advances
- Nuclear Imaging
- Echocardiography
- CT Imaging
- Cardiac MRI
Noninvasive Cardiology

• Dedicated physicians exploring and bringing new technology to the community
Noninvasive Cardiology

- Dedicated physicians exploring and bringing new technology to the community
- Commitment of the hospital systems here in Lancaster to embrace new proven technology
Noninvasive Cardiology

- Dedicated physicians exploring and bringing new technology to the community
- Commitment of the hospital systems here in Lancaster to embrace new proven technology
- Commitment of the community
Noninvasive Cardiology

- Dedicated physicians exploring and bringing new technology to the community.
- Commitment of the hospital systems here in Lancaster to embrace new proven technology.
- Commitment of the community
- A robust and fiscally sound economy.
Early EKG
Appearance of a typical scanned ECG.
GE MUSE ECG in EPIC

26-JUN-1998 (76 yr)
Male Caucasian
0B
Room: Loc:226

Vent. rate 62 BPM
PR interval 136 ms
QRS duration 98 ms
QT/QTc 442/448 ms
P-R-T axes 31 10 7

Normal sinus rhythm with sinus arrhythmia
Normal ECG
Normal ECG
No significant change was found

Confirmed by McKeman Pulliam MD, Melissa (136) on 8/27/2014 2:53:25 PM

Technician: BB
Test ind:

Referred by: JACOB
Electronically Signed by: Melissa McKeman Pulliam MD

I
aVR
V1
V4

II
aVL
V2
V5

III
aVF
V3
V6

II

25mm/s 10mm/mV 40Hz 8.0.1 12SL 239 CID: 1

55 27-AUG-2014 ORDER: 91734989 ACCOUNT: 639893422
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Echocardiography

• M Mode invented and used in the mid 1960’s
Early M Mode Echocardiography
Early M Mode Echocardiography
Early M Mode Echocardiography
Echocardiography

• M Mode invented and used in the mid 1960’s
• Two dimensional echocardiography in the mid 1970’s
Echocardiography

- M Mode invented and used in the mid 1960’s
- Two dimensional echocardiography in the mid 1970’s
- 1980’s Color flow Doppler was introduced
Echocardiography

- M Mode invented and used in the mid 1960’s
- Two dimensional echocardiography in the mid 1970’s
- Tranesophageal Echocardiography
Echocardiography

• M Mode invented and used in the mid 1960’s
• Two dimensional echocardiography in the mid 1970’s
• Transesophageal Echocardiography
• 3 Dimensional imaging
3D TEE
3D TEE
3D TEE
Echocardiography

- M Mode invented and used in the mid 1960’s
- Two dimensional echocardiography in the mid 1970’s
- Transesophageal Echocardiography
- Strain Imaging
Left Ventricular Strain
Nuclear Imaging
Nuclear Imaging
CTA

• CT scanner technology
CTA

- CT scanner technology
- Fast acquisition times
CTA

- CT scanner technology
- Fast acquisition times
- 3D reconstruction
CTA

- CT scanner technology
- Fast acquisition times
- 3D reconstruction
- Imaging of coronary arteries
Cardiac CT Angiography
Cardiac CT Angiography
Cardiac CT Angiography
Cardiac CT Angiography
Computer Tomographic Angiography
Invasive Coronary Angiography Post Stent 2015
Cardiac CT imaging of a mechanical valve
Cardiac CT imaging of a mechanical valve
Cardiac CT imaging of a mechanical valve
Cardiac MRI
Cardiac MRI
Cardiac MRI
Cardiac MRI
Cardiac MRI
Cardiac MRI
Cardiac MRI
Cardiac MRI
Fifty years of Noninvasive Cardiology in Lancaster
A special thanks to those who contributed images and helped in making this possible

• Ron Jacob MD
• Dean Hollenbacher
• Chris Wilt
• Jason Bell
• Debra Eshleman-Bitts
Cardiac Surgery at LGH
1983 - Present

Mark W. Burlingame, MD
April 21, 2016
Surgeons of the Past and Present

L-R: Mark Burlingame, MD; Dr. Bonchek and Dr. Burlingame perform an early surgery; program founder Lawrence Bonchek, MD

Top: Jeffrey Cope, MD
Bottom: Mark Epler, MD

L-R:
Barry Zadeh, MD;
Edward Lundy, MD;
Bradley Vazales, MD

Other surgeons:
Dr. Polidori
Dr. Chatterjee
Dr. Manetta
Dr. Thompson
1st case:
Gary W. Ghee had CABG, Sept. 7, 1983
OR – then and now
• Peak volume – 1991; total cases = 957
• Does not include case volume from St. Joseph’s Hospital or Brandywine Hospital
• Total cases 1983-2015: 22,196
Historical Photos
25th Anniversary of the Heart Surgery Program
Endoscopic conduit harvesting

Source: Cohn LH; Cardiac Surgery in The Adult, 4th Edition: www.accesssurgery.com

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Thoracic Endovascular Aortic Repair (TEVAR)
Homograft Aortic Valve Replacement

Proximal suture line during subcoronary implantation (either single U-stitches or running suture).

Final stitches of the distal running suture line to fix the commissures of the homograft.
Ross Procedure
Ventricular Assist Device (VAD)

- Oct. 14, 2005 first implant by Edward Lundy MD
  This patient underwent transplantation Jan. 21, 2006

- Jeff Cope MD and Mark Epler MD presently implant

- 50 patients to date; 9 have received transplants

- 20 patients with current support, 2 of whom on transplant list
Examples of Ventricular Assist Devices (VADs)
ECMO: Extracorporeal Membrane Oxygenator
Off Pump CABG

Minimally Invasive Direct CABG (MID-CAB)

• Robotics for LIMA takedown
• Anastomosis via small incision under direct vision
• First Case 2013; Jeff Cope MD
Minimally invasive Mitral Valve Surgery

First Case 2011  Mark W Burlingame MD
Minimally Invasive Aortic Valve Replacement

- First Case 2012 Jeff Cope MD
Transvascular Aortic Valve Replacement (TAVR)

- 1st implant: August 29, 2012
- Dr’s Cope, Epler, Dumasia, Harvey

Total to date: 137
TAVR Animation
Hybrid Operating Room
Number of surgical and transcatheter procedures performed

Note: Based on data from the Institute for the Hospital Remuneration System.

Transvascular/ Transapical Mitral Replacement (TMVR)