CARDCIOLOGY GRAND ROUNDS

Presentation: How to be a Safe and Effective Cardiac Surgeon
Speaker: Lawrence Cohn, MD
Cardiac Surgeon
Brigham and Women’s Hospital
Date: Monday, March 23, 2015, 7:00 – 8:00 AM
Location: ANW Education Building, Watson Room

OBJECTIVES
At the completion of this activity, the participants should be able to:
1. Discuss the principles and practice of all forms of acquired cardiac surgery based on standard of care and safety issues.
2. Describe methods of improving patient outcomes.
3. Communicate successfully in their relations with patients and their families, while promoting teamwork.

ACCREDITATION
Physicians: This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of Allina Health and Minneapolis Heart Institute Foundation. Allina Health is accredited by the ACCME to provide continuing medical education for physicians.

Allina Health designates this live activity for a maximum of 1.0 AMA PRA Category 1 Credit™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Nurses: This activity has been designed to meet the Minnesota Board of Nursing continuing education requirements for 1.2 hours of credit. However, the nurse is responsible for determining whether this activity meets the requirements for acceptable continuing education.

Others: Individuals representing other professional disciplines may submit course materials to their respective professional associations for 1.0 hours of continuing education credit.

DISCLOSURE STATEMENTS
Speaker(s): Dr. Cohn has declared that he does not have a conflict of interest in making this presentation.
Planning Committee: Dr. Michael Miedema, and Eva Zewdie have declared that they do not have any conflicts of interest associated with the planning of this activity. Dr. Robert Schwartz declared the following relationships - stockholder: Cardiomind, Interface Biologics, Aritech, DSI/Transoma, InstyMeds, Intervalve, Medtronic, Osprey Medical, Stout Medical, Tricardia LLC, CoAptus Inc, Augustine Biomedical; scientific advisory board: Abbott Laboratories, Boston Scientific, MEDRAD Inc, Thomas, McNerney & Partners, Cardiomind, Interface Biologics; options: BackBeat Medical, BioHeart, CHF Solutions; speakers bureau: Vital Images; consultant: Edwards LifeSciences.

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How to be a Safe and Effective Cardiac Surgeon

What the Cardiothoracic Surgeon of the Twenty-First Century Ought to Be

American Association for Thoracic Surgery
79th Presidential Address

Lawrence H. Cohn, MD
JTCVS Vol 118;4:581-587
What the CT Surgeon of the 21st Century Ought to Be
11 Qualities

1. Ought to be an excellent surgeon
2. Ought to be a physiologist
3. Ought to be an excellent teacher
4. Ought to be knowledgeable about the economics of healthcare
5. Ought to be well versed in digital technology
6. Ought to be knowledgeable if not expert in new technology
7. Ought to be a leader
8. Ought to be adaptable
9. Ought to be persistent
10. Ought to have a good sense of the history of our specialty
11. Ought to be a humanist

“Nothing in the world can take the place of persistence. Talent will not; nothing is more common than unsuccessful people with talent. Genius will not; unrewarded genius is almost a proverb. Education will not; the world is full of educated derelicts. Persistence and determination alone are omnipotent. The slogan “press on” has solved and always will solve the problems of the human race”

Calvin Coolidge
30th President of the US
“The most difficult part in the training of surgical residents is not the manual training, but how to teach them to think critically and independently.”

Theodore Bilroth
Professor of Surgery
Vienna, Austria
1829 - 1894

In Cardiac Surgery success is ultimately determined by details
Excellence is in the details. Give attention to the details and excellence will come.
Be willing to make good decisions. That’s the most important quality in a good leader. Don’t fall victim to the ready-aim-aim-aim-aim syndrome. You must be willing to fire.

….. T. Boone Pickens

Change is the law of life. And those who look only to the past or present are certain to miss the future.

John F. Kennedy
Confidence is essential; arrogance is deadly

The preoperative consultation should be performed with at least as much care as the technical operation.
The three most important determinants of cardiac surgical outcomes are:

1. PATIENT SELECTION
2. PATIENT SELECTION
3. PATIENT SELECTION

Insist on total information from “the team”. They are not their patients, they’re yours!
Three A’s of a Successful Practice

Ability

Affability

Availability

Be a surgeon, but also be a doctor
Don’t be afraid to do a new procedure be prepared.

Failure to prepare is preparing to fail
- John Wooden, UCLA Basketball Coach

“The way we communicate with others and with ourselves ultimately determines the quality of our lives” ---- Anthony Robbins

The single biggest problem in communication is the illusion it has taken place ---- George Bernard Shaw
Speed in operating is nothing more than economy of movement, practice and confidence

“It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change.”

….. Charles Darwin
New technology is sometimes more advanced than our ability to apply it properly

Check List

Have anesthesia and perfusion repeat your directions aloud

Never lose control of the room
Understand myocardial protection and methods for different patients

Lower aortic flow when tying sutures on the aorta, applying clamp etc.
CABG

endoscopic vs harvest

LIMA…….. always!!!

RIMA…….. sometimes

In very high-risk patients don’t try to graft every single blocked artery

LESS is MORE
In combined valve/CABG revascularize first

Never oversize a valve either mechanical or bioprosthetic
Learn how and when to repair a mitral valve

Leave anterior leaflet in mitral valve replacement only in cases with decreased LV function
In AVR debride all calcium on valve in annulus:

- better fixation
- large valve

In most adults, a 19mm valve in a 19” annulus is OK
Use the TEE in every valve case and use for de-airing

In reoperative surgery expose groin vessels in every patient
Perfection is the enemy of the good!!

The Service Line

An interactive collaborative network of specialists focused on a single disease entity applicable to an organ system

- Cardiology
- Cardiac anesthesia
- Cardiac surgery
Cardiac Surgery….the next century: general trends

- Much less invasive
- Less cardiopulmonary bypass
- Older patients
- More valvular disease
- More heart failure
- More arrhythmia surgery
- More adult congenital

CABG

- Less routine
- Hybrid surgery as stent technology improves
- More robotic technology
- More OPCAB?
- LIMA (LITA) still the gold standard for revascularization
Ease of application often trumps effectiveness

Lawrence H. Cohn, MD
2003

Robotic mammary takedown and off-pump bypass surgery for single-vessel disease of the left anterior descending coronary artery.

Mihaljevic T, Paul S, Byrne JG, Leacche M, Farivar RS, Soltesz EG, Rawn JD, Cohn LH. Division of Cardiac Surgery, Department of Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts 02215, USA.

Robotic takedown of the left internal mammary artery and direct off-pump anastomosis to the left anterior descending artery through small thoracotomy incisions can be done safely with minimal morbidity and is associated with decreased blood loss, decreased ventilatory requirements, less intensive care unit stay, and less overall length of stay.

It should be considered as an alternative to percutaneous angioplasty and stenting for those with isolated left anterior descending artery disease.
CABG: Hybrid Technology

**Definition:** Combination of minimally invasive LIMA-LAD with stents

- Interdisciplinary approach between surgeon and interventionalist
- Catheter-based therapy for circumflex and PDA territories
- LIMA-LAD: via MIDCAB via small anterior thoracotomy

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*The LIMA/LAD is the best coronary revascularization procedure ever performed or ever will be performed. EVER!*
The left internal mammary (left internal thoracic)-left anterior descending (LAD) coronary artery bypass is the “gold standard” of coronary revascularization. The seminal work by Floyd Loop at the Cleveland Clinic demonstrated its long-term patency and efficacy. Frames of the angiogram were obtained in July 2002 from a 65 year old man, 36 years after his initial operation. On August 16, 1972 at the Brigham and Women’s Hospital, he underwent a single vessel left internal mammary artery bypass to a stenotic LAD coronary artery. Five years later he had a coronary bypass vein graft to the descending coronary artery circulation. In July 2003, carotid artery disease and recurrent angina developed, which required a stent to the saphenous vein graft. We obtained this angiogram during that work-up. This patient could have the oldest patent mammary anastomosis ever documented by a postoperative angiogram, which testifies to the longevity of the superb revascularization operation for single vessel coronary artery disease.

Lawrence H. Cohn, MD
JTCVS Volume 124 (6) pg 7A (cover)
Valvular Heart Disease

- Increase in elderly with AS
- Increase of MVP versus MVR
- Minimally invasive valve surgery
- Percutaneous valve procedures
- The true hybrid OR

Valvular Disease: Aortic Valve

- Incidence of calcific aortic disease will continue to rise as population ages
- Valve sparing techniques growing in popularity
- Aneurysm surgery for BAV
- Valve repair devices
## Minimally Invasive Valve Surgery
### 1996 - 2014

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitral Valve</td>
<td>1047</td>
</tr>
<tr>
<td>Aortic Valve</td>
<td>1760</td>
</tr>
<tr>
<td>Total</td>
<td>2807</td>
</tr>
</tbody>
</table>

**Operative mortality**
- Mitral Valve: 8/1047 (0.8%)
- Aortic Valve: 47/1760 (2.7%)

### Minimally Invasive Aortic Valve Replacement in the Octogenarian
#### The Brigham Experience

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reoperations</td>
<td>68/396</td>
<td>16%</td>
</tr>
<tr>
<td>Class III/IV</td>
<td>202</td>
<td>51%</td>
</tr>
</tbody>
</table>

**Operative mortality**
- 17/396 (4%)
  - Non-reoperations: 11/328 (3%)
  - Reoperations: 6/68 (9%)

**STS/Euroscore**

**Conclusion:** Patients thought to be high-risk candidates for surgical AVR have excellent outcomes after minimally invasive surgery with long-term survival that is no different than that of an age and gender matched US population. These data provide a benchmark against which outcomes of percutaneous/transapical aortic valve replacements should be compared.
The Future of Cardiac Surgery…. What’s Next

Effectiveness of Same Day Percutaneous Coronary Intervention Followed by Minimally Invasive Aortic Valve Replacement for Aortic Stenosis and Moderate Coronary Disease (“Hybrid Approach”)

Derek R. Brinster, Daniel Simon, Lawrence H. Cohn, M.D. et al
From the Division of Cardiac Surgery & Cardiovascular Medicine
Brigham and Women’s Hospital, Boston, MA
Am J Cardiol 2006 Dec 1;98:1501-1503

Conclusion: This hybrid strategy has low morbidity and mortality and may be a new therapeutic option for older, high-risk patients with combined CAD and aortic valve disease
Transapical TAVR

Direct Aortic Access
BWH TAVR Experience

Distribution of first 300 Edwards Sapien Cases

BWH Mitral Valve Experience 1994-2008

# patients

year

# patients

year
Mitral Valve Repair

- Still < 50% of MV ops in U.S.
- Need simplification
- Best long term results
- Mini procedures: open robot cardioscopy

Thoracic Aortic Surgery

- Increasing number of elderly with aortic aneurysms
- Endoluminal stenting will increase into the arch and ascending aorta
- Need better visibility of aortic arch and aorta
- Catheter Echo? Cardioscopy?
The Future of Cardiac Surgery...... What’s Next?

Adapt or die: The imperative for a culture of innovation in cardio-thoracic surgical training

Justo Rafael Sadaba, David J. O'Regan, Arie Peter Kappetein
Eur J Cardiothorac Surg. 2007 May;31(5):960

Evolution's rules are simple: creatures that adapt to threats and master the evolutionary game thrive; those that don’t, become extinct. There are tools available to successfully train cardiothoracic surgeons in a 48 h/week environment. Some have discussed in the text; many others have been left in the inkpot. It is our obligation to make good use of all of them and continue the research in this field.

Conclusions

- The future is bright for cardiac surgery
- There is and will be paradigm shifts
- Adaptation and change is critical in the surgeon, cardiologist, anesthesiologist, and hospitals
"If you don't know where you are going, you will wind up somewhere else."

“The future ain't what it used to be.”

Yogi Berra

Even if you are on the right track, you’ll get run over if you just sit there.

----- Will Rogers
Most surgeons know who to operate on; really good ones know who *not* to operate on.

Some hearts are so broken even you can’t fix ‘em.

If you never have any complications it means you’re not operating very much; bad outcomes can occur even in the best of hands.
“The secret of your future is hidden in your daily routine.” — Mike Murdock

Success is not a destination thing, it’s a daily thing.” — John Maxwell

“Efficiency is doing things right; effectiveness is doing the right things.” – Peter Drucker

Cardiac surgery is similar to carpentry, car repair and plumbing in that, for some reason occasional profanity seems to be of great benefit.
“If your actions inspire others to dream more, learn more, do more and become more, you are a leader.”

--- John Quincy Adams --- 6th President of the United States of America

*If I have seen further, it is by standing on the shoulders of Giants.*

- Sir Issac Newton
“The only way to predict the future………………
Is to invent it yourself.”

Norman E. Shumway, M.D.