36th ANNUAL MEETING
June 23 – 26, 2010
Ojai Valley Inn
Ojai, California

37th ANNUAL MEETING
June 22 – 25, 2011
The Broadmoor Hotel
Colorado Springs, Colorado

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* These sections available on site in Banff, Alberta, to professional attendees, or by logging into the Members Only Area of the WTSA Website at http://members.westernthoracic.org/index.cgi.
OFFICERS AND COUNCIL

President
David A. Fullerton
Aurora, Colorado

Vice President
J. Scott Millikan
Billings, Montana

Immediate Past President
Douglas E. Wood
Seattle, Washington

Secretary
Thomas A. Burdon
Palo Alto, California

Treasurer
John D. Mitchell
Aurora, Colorado

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Robert C. Robbins (2009)
Stanford, California

Patricia A. Thistlethwaite (2011)
San Diego, California

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Hillsborough, California

Historian
Marvin Pomerantz
Aurora, Colorado

Representative to the
Board of Governors,
American College of
Surgeons
Gabriel S. Aldea
Seattle, Washington

Editor
Lawrence H. Cohn
Boston, Massachusetts

2008–2009 COMMITTEES

LOCAL ARRANGEMENTS – 2009
Michael J. Weyant & Jill Rennert,
Co-Chairs & Samson Fun Run
Joseph C. Cleveland, Jr., Golf Tournament
Richard I. Whyte, Tennis Tournament

MEMBERSHIP COMMITTEE
Anees J. Razzouk, Chair (2011)
James M. Douglas, Jr. (2011)
Riyad C. Karmy-Jones (2009)
Ivan M. Rebeyka (2009)
Richard I. Whyte (2010)

NOMINATING COMMITTEE
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Elliot T. Gelfand (2012)
Steven W. Guyton (2010)
R. Scott Mitchell (2011)
Douglas E. Wood (2013)

PROGRAM COMMITTEE
Joseph C. Cleveland, Jr., Chair (2009)
Ross M. Bremner (2010)
Gordon A. Cohen (2011)
Arvind Koshal (2009)
Ross M. Ungerleider (2011)
Michael J. Weyant (2010)
Thomas A. Burdon Ex-Officio (2009)
Lawrence H. Cohn Ex-Officio (2009)
David A. Fullerton Ex-Officio (2009)

REPRESENTATIVES
Representative to the
Advisory Council
American College of
Surgeons
Douglas E. Wood
Seattle, Washington

Representatives to the
Thoracic Surgery
Foundation for
Research & Education
D. Craig Miller
Stanford, California
R. Scott Mitchell
Stanford, California
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<tr>
<th>Time</th>
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<td>9:00 am – 1:00 pm</td>
<td>Council Meeting</td>
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<td>Speaker Ready Room</td>
<td>N.R. Crump</td>
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<td>7:00 pm – 9:00 pm</td>
<td>New Members Reception</td>
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<td>Kids Reception</td>
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<td>Samson Fun Run</td>
<td>Stanley Thomson Arch</td>
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<td>7:00 am – 8:00 am</td>
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<td>11:40 am – 12:30 pm</td>
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<td>1:00 pm – 5:45 pm</td>
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<td>6:30 pm – 10:00 pm</td>
<td>Medieval Night Theme Dinner</td>
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<td>6:00 am – 12:00 pm</td>
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*Separate Subscription Required
**WESTERN THORACIC SURGICAL ASSOCIATION**

11:00 am – 12:00 pm  Scientific Session IV  
*Van Horne Ballroom A*

1:00 pm – 6:00 pm  Golf Tournament*  
*Stanley Thompson Course*

2:00 pm – 5:00 pm  Tennis Tournament*  
*Tennis Center*

Free Evening

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**SATURDAY, June 27, 2009**

6:00 am – 11:30 am  Speaker Ready Room  
*N.R. Crump*

6:00 am – 12:00 pm  Registration  
*Van Horne Ballroom Foyer*

6:30 am – 7:30 am  Continental Breakfast  
*Van Horne Ballroom BC*

6:30 am – 10:30 am  Exhibits  
*Van Horne Ballroom BC*

7:00 am – 8:15 am  Concurrent Forums  
A) Adult Cardiac Session  
*Van Horne Ballroom A*

B) General Thoracic Session  
*Sir Edward Beatty*

C) Congenital Heart Disease Session  
*Baron Shaughnessy*

7:00 am – 11:00 am  Family Hospitality  
*Ivor Petrak Room*

8:20 am – 8:30 am  Eulogy for and Posthumous Presentation of David J. Dugan Award to Richard P. Anderson  
*Van Horne Ballroom A*

8:30 am – 9:50 am  Scientific Session V  
*Van Horne Ballroom A*

9:50 am – 11:00 am  Coffee Break, Visit Exhibits  
*Van Horne Ballroom BC*

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*Separate Subscription Required*
GENERAL INFORMATION

1. REGISTRATION:
The Registration Desk will be located in the Van Horne Ballroom Foyer area of The Fairmont Banff Springs during the following hours:

- Wednesday, June 24th: 1:00 pm – 6:00 pm
- Thursday, June 25th: 7:00 am – 12:00 pm
- Friday, June 26th: 6:00 am – 12:00 pm
- Saturday, June 27th: 6:00 am – 12:00 pm

2. SPEAKER READY ROOM:
The Speaker Ready Room will be located in the N.R. Crump room, across from the Scientific Session room. Presenting authors are requested to turn in their PowerPoint slides to the technician in the Speaker Ready Room at least 30 minutes prior to the opening of the session at which they are to present (presentation slides can be turned in as early as Wednesday, 6/24). All presentations must be submitted in PowerPoint format only.

3. ACCREDITATION:
The Western Thoracic Surgical Association is accredited by the Accreditation Council for Continuing Medical Education to sponsor continuing medical education for physicians.

The Western Thoracic Surgical Association designates the annual meeting program, a continuing medical education activity, for up to a maximum of 12.75 AMA PRA Category 1 Credits™, per the following breakdown:

- Scientific Sessions I–VI, up to 7.25 credits
- Presidential Address, up to 0.75 credit
- Controversies in Thoracic Surgery, up to 0.75 credit
- Simultaneous Breakfast Sessions, up to 1.25 credits
- Postgraduate Course, up to 0.75 credit
- Concurrent Forums, up to 1.25 credits
- Lillehei Point/Counterpoint Session, up to 0.75 credit

4. CME MISSION STATEMENT:

Purpose
The Western Thoracic Surgical Association (WTSA) is committed to improving patient care and enhanced patient quality of life through the provision of state-of-the-art continuing medical education (CME) to its members and non-member attendees at its sole CME activity, its annual meeting. The overarching goal of the WTSA CME program is to provide a high quality CME activity (its annual meeting) that will address the professional practice gap of its physician and allied health learners by facilitating change in participants, competence and performance.

Content Areas
The content areas of the WTSA’s CME program include but are not limited to, acquired heart disease, thoracic oncologic issues, congenital heart disease, general thoracic disorders, pulmonary disorders, and adult cardiac disease. The scope of activities involves the body of knowledge and skills generally recognized and accepted by the profession and the specialty as within the basic medical-surgical sciences, surgical specialties, the discipline of clinical medicine, and providing healthcare to the public.

Target Audience
In the context of WTSA’s role as a regional surgical membership association, the target audiences of the WTSA’s CME program are its current members, as well as a potential member base including physicians and other healthcare professionals involved in the diagnosis and treatment of cardiothoracic disease. These include, among others, general thoracic surgeons, cardiothoracic surgeons, interventional radiologists, cardiologists, and cardiothoracic anesthesiologists, as well as allied healthcare professionals who may benefit from team learning activities. The WTSA reaches throughout the western United States and the western provinces of Canada in its attempt to make the most current information available to as wide a medical/physician/surgical audience as possible.

Types of Activities Provided
Through its sole CME activity, the annual meeting, the WTSA provides topic based abstract sessions, a postgraduate course, a controversies in cardiothoracic surgery panel discussion, and a point/counterpoint debate session all of which foster audience participation through a designated question and answer period subsequent to the presentation. In addition, highly specialized techniques, protocols, and findings are offered in each of the three subspecialties of adult cardiac surgery, general thoracic surgery, and congenital heart disease through individual breakfast sessions, moderated poster sessions, and/or concurrent brief communications symposia offered during the course of the annual meeting.
**Expected Results**

The success of the CME mission is measured by the extent to which participants in the WTSA annual meeting have gained an enhanced understanding of the latest techniques and current research specifically related to adult cardiac surgery, general thoracic surgery, and congenital heart disease, and have incorporated these lessons learned into their practice environment. Furthermore, through these changes and individual practice environments, it is expected that positive changes in physician/surgeon competence and performance in limited instances will be accomplished. The overarching expected result of the WTSA's CME mission is improved patient care and enhanced patient quality of life through advanced medical education of the association's membership and active participants in its CME program, the annual meeting.

**5. OBJECTIVE:**

The Annual Meeting of the Western Thoracic Surgical Association is designed to provide two-and-a-half days of comprehensive educational experience for WTSA members and guest physicians in the field of thoracic and cardiovascular surgery. It is the Association's intent to bring together the leading surgeon scientists in these specialties to freely and openly discuss their latest clinical and research efforts.

This year’s program begins on Thursday with a half-day scientific plenary session of original papers and concludes with the highly successful “Controversies in Thoracic Surgery”. The controversies debate addresses whether “The Time Is Now for Cardiac and Thoracic Surgery to Part Ways”.

Friday morning begins with three simultaneous breakfast sessions, featuring recognized leaders in Adult Cardiac, General Thoracic, and Congenital Heart Disease, who will provide state-of-the-art techniques and procedures in each specialty. The scientific program continues with the annual Postgraduate Course and a scientific plenary session of original papers.

The Saturday scientific program begins with concurrent moderated forums of shorter-form oral presentations addressing a far ranging field of topics in each of the three subspecialties. The plenary science continues with additional original papers and concludes with the C. Walton Lillehei Point/Counter-Point Session, sponsored by an educational grant from St. Jude Medical. The debate this year will focus on whether “Graduating Cardiothoracic Surgeons Should Get a Learner's Permit, Not a Driver's License”.

At the conclusion of the Annual Meeting, participants should have an enhanced understanding of the latest techniques and current research specifically related to the fields of adult cardiac, general thoracic, and congenital heart disease clinical surgery, experimental surgery and related sciences, surgical education, and the socioeconomic aspects of surgical care. Through the open discussion periods for each of the six plenary Scientific Sessions, the Controversies in Thoracic Surgery session, the three Simultaneous Breakfast sessions, the Postgraduate Course, the Concurrent Forums on Adult Cardiac, General Thoracic and Congenital Heart Disease, and the Point/Counterpoint session, participants will have the opportunity to hear the pros and cons of each paper and/or debate presented to gain an overall perspective of their current practices and utilize results presented to select appropriate surgical procedures and interventions for their own patients and integrate state-of-the-art knowledge into their current practice and/or research.

**6. DISCLOSURE STATEMENT:**

In compliance with ACCME regulations, the Western Thoracic Surgical Association must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. Program Committee members as well as moderators were required to disclose all financial relationships and invited speakers, presenting authors and co-authors, and discussants were required to disclose any financial relationship as it pertains to the content of their presentations. The WTSA defines a “commercial interest” as any proprietary entity producing health care goods or services consumed by, or used on patients. The ACCME does not consider providers of clinical service directly to patients to be commercial interests. The WTSA considers “relevant” financial relationships as financial transactions (in any amount) occurring within the past 12 months that may create a conflict of interest.

The WTSA is also required to manage any reported conflict by invited speakers, presenting authors, discussants, and moderators, and to eliminate the potential for bias during the activity. Conflicts beginning on page 241 have been managed to the Association’s satisfaction. However, if you perceive a bias during a session, please report the circumstances on the session’s online evaluation.

It is the responsibility of the invited speakers and presenting authors to disclose at the start of presentations if they will be describing either the use of a device, product, or drug that is not FDA approved or the off-label/unapproved use of an approved device, product, or drug.

The requirement for disclosure is not intended to imply any impropriety of such relationships, but simply to identify such relationships through full disclosure, and to allow the audience to form its own judgments regarding the presentation.
7. BREAKFAST SESSIONS

Three optional breakfast sessions are scheduled for Friday morning, June 26th from 6:30 am – 7:50 am. There is a separate registration fee of $60 per person:

A) Adult Cardiac Session
   D.C. Coleman
   Controversies in Cerebral Protection During Cardiac Surgery
   Speaker: Roderick MacArthur

B) General Thoracic Session
   Sir Edward Beatty
   Is Very Early Esophageal Cancer a Surgical Disease?
   Speaker: Ross M. Bremner

C) Congenital Heart Disease Session
   Baron Shaughnessy
   Hybrid Treatments of Congenital Heart Disease
   Speaker: Gordon A. Cohen

8. EXHIBITS:

Commercial exhibits are located in Van Horne Ballroom BC and open during the following hours:

- Thursday, June 25th: 7:00 am – 12:00 pm
- Friday, June 26th: 7:30 am – 12:00 pm
- Saturday, June 27th: 6:30 am – 10:30 am

Continental breakfast is available for all registered physicians in the Exhibit Hall during the following hours:

- Thursday, June 25th: 7:00 am – 8:00 am
- Friday, June 26th: 7:30 am – 8:00 am
- Saturday, June 27th: 6:30 am – 7:30 am

Coffee and other beverages will be available during scheduled breaks.

9. HOSPITALITY SUITE:

A hospitality suite is available in the Ivor Petrak Room for all registered spouses, guests, and family members during the following hours:

- Thursday, June 25th: 7:00 am – 11:00 am
- Friday, June 26th: 7:00 am – 11:00 am
- Saturday, June 27th: 7:00 am – 11:00 am

Continental breakfast is available from 7:00 am to 9:00 am each day; coffee and other beverages are available during all hospitality hours.

10. BADGE IDENTIFICATION:

- Member and Spouse: Cream
- Guest Physician and Spouse: Blue
- Allied Personnel: Green
- Exhibitor: Yellow
SOCIAL PROGRAM

(Included in the Registration Fee)

Included in the registration fee for spouses/guests are the New Members Reception on Wednesday evening, the Medieval Night Theme Dinner on Thursday evening, the Saturday Luncheon, the President’s Reception and Banquet on Saturday evening, and daily continental breakfasts (served in the Exhibit Hall for meeting attendees and in the Hospitality Suite, located in the Ivor Petrak Room, for family members).

NEW MEMBERS RECEPTION
Wednesday, June 24  7:00 pm – 9:00 pm

Join the WTSA in welcoming its new members. The reception will be held in Mount Stephen Hall. The high ceiling with oak beams, stone floor, and cathedral windows with stained-glass crests truly reflect the style of a baronial castle, while the soft amber lighting creates the perfect atmosphere in the evening.

Children ages 5–18 are invited to their own Kids Welcome Reception, to be held concurrently. Games and arts and crafts will be among the entertainment offered for kids, along with dinner. Please note that all children must be registered for the meeting to attend this function.

SAMSON FUN RUN
Thursday, June 26  6:00 am

The morning Fun Run will begin at the Stanley Thompson entrance and proceed down a paved path past the Waldhaus restaurant. Cross a small bridge onto the beautiful winding Golf Course road. Enjoy the breathtaking views of the mountains through the trees while passing some of the fairways on the Fairmont’s world-class Stanley Thompson Golf Course. The course will then take the same route back, leaving a challenging uphill climb to the finish line! All participants will receive an official Samson Fun Run T-shirt at the finish line. Prizes will be presented at the Saturday luncheon.

MEDIEVAL NIGHT THEME DINNER
Thursday, June 25  6:30 pm – 10:00 pm

Held in the Alberta Room, this Medieval Night will recreate the atmosphere of a great banquet in the tradition of Sixteenth Century England. The King and Queen invite all Lords and Ladies from Western regions near and far to attend a spectacular feast in celebration of the WTSA’s 35th Annual Meeting. Revelers are encouraged to dress in costume. Please note that all children must be registered for the meeting to attend this function.

SATURDAY LUNCHEON
Saturday, June 27  12:30 pm – 2:00 pm

Join registered physicians, spouses, guests, and family members for this outdoor luncheon on the Upper Bow Valley Terrace. Enjoy spectacular views and applaud award winners from the Samson Fun Run and Golf and Tennis Tournaments. Please note that all children must be registered for the meeting to attend this function.

PRESIDENT’S RECEPTION AND BANQUET
Saturday, June 27  7:00 pm – 11:00 pm

The 35th Annual Meeting will conclude with the Presidential Reception and Banquet in the beautiful Riverview Lounge and Cascade Ballroom—the Fairmont Banff Springs’ original ballroom, restored to bring back the glamour of the roaring 1920s. Calgary favorites the Dino Martinis will keep the room dancing for hours. Dress is black tie optional.

Family members aged 5–18 will be in for their own fun evening during the concurrent Kids Banquet. Please note that all children must be registered for the meeting to attend this function.
**GOLF/ TENNIS TOURNAMENTS**

*(Separate Subscription Required)*

**GOLF TOURNAMENT**

*The Fairmont Banff Springs Stanley Thompson Golf Course*

Friday, June 26 1:00 pm

Renowned for its panoramic beauty, The Fairmont Banff Springs Golf Course is situated in Banff National Park, a mile high in the Canadian Rockies. With a breathtaking view in every direction, this captivating and challenging layout provides the perfect environment for the Annual Golf Tournament. Pre-registration is required with indication of handicap.

$250 per person includes transportation to the course, greens fees, box lunch, cart and prizes.

**TENNIS**

*Tennis Center*

Friday, June 26 2:00 pm

The tennis tournament is a perfect opportunity to mingle with colleagues and meet new friends. Open to all skill levels. Pre-registration is required with indication of level of play.

$60 per person includes courts, refreshments and prizes.

**CHILD CARE SERVICES**

All child care needs to be booked for a 4 hour minimum and require a 24 hours notice for all cancellations. Reserve direct by calling 403-760-4443 or through the Concierge at the Fairmont Banff Springs, 403-762-6895. As much advance notice as possible is appreciated.

**Hourly Rates**

Alberta Law requires that when booking child care for 2 or more children under the age of 1, a care giver is required for each baby.

- 1 or 2 children $16.00 per hour
- 3 children $19.00 per hour
- 4 children $23.00 per hour
- 5 children $26.00 per hour

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**OPTIONAL TOURS/ACTIVITIES**

**KANANASKIS RIVER RAFTING**

*Registration Required*

Thursday, June 25 12:45 pm – 5:45 pm

**Cost:** $105.00

Winding through the picturesque landscape of Kananaskis Country, the Kananaskis River is a great whitewater experience for families. This river offers the novice rafter a thrilling and fun introduction to whitewater rafting.

**Itinerary and Highlights:**

- Hotel pick up and drop off
- Experience Grade I–III rapids on the Kananaskis River
- Option to swim or use a float in Grade II rapids at the end
- Stunning scenery

**Tour Includes:**

- Lunch
- Professional and certified guides
- Life jacket, helmet, wet suit, spray jacket and booties

**Remember to Bring:**

- Bathing suit and towel, and a bag to hold your personal belongings
- Change of clothes (warm sweater) for after your rafting trip
- Sunscreen & baseball cap on warm days
- Toque or wool hat on colder days

**Restrictions:**

- Minimum age is 5 years
- Minimum weight is 40 lbs (18 kgs)
LAKE LOUISE SIGHTSEEING

Registration Required

Thursday, June 25 1:00 pm – 5:45 pm

Cost: $80.00

Visit the “Jewel of the Canadian Rockies”, Lake Louise, and the world renowned Moraine Lake, both of which are part of a UNESCO World Heritage Site. Take photos and explore the shorelines. Learn about mountaineering history and how a tragic accident at Lake Louise shaped Canadian mountain culture. Finally, take a short walk to a viewpoint in the Valley of Ten Peaks overlooking Moraine Lake.

Itinerary and Highlights:
− Bow Valley Parkway: Wildlife watching and the role of fire in the park.
− Castle Mountain: Learn how this local landmark got its name
− Lake Louise: Take a stroll on the lake shore and visit the famous Chateau
− Moraine Lake: Walk up the rock pile and stroll the shoreline. With its emerald waters and massive peaks, this lake is a sightseer’s favorite.

Tour includes:
− Friendly, certified guide
− Hands on interpretive tools
− Hotel pick up and drop off
− Lunch

Things to remember:
− Dress for the weather.
− Don’t forget your camera.

ADDITIONAL ACTIVITIES

With so much to see and do, the Fairmont Banff Springs Concierge Services will be there to help you make the most of your precious time. Whether for sightseeing, dining reservations, child care, or tour and activity reservations, the concierge will gladly assist you to make your stay a memorable experience.

Be sure to utilize the concierge services by contacting them directly at 403-762-6895 or by visiting them directly.

ACKNOWLEDGMENTS

The Western Thoracic Surgical Association wishes to thank the following companies and organizations for their support of the 35th Annual Meeting:

EDUCATIONAL GRANTS

White Memorial Medical Center and Foundation – Lyman A. Brewer, III, Fund for their support of the Postgraduate Course
St. Jude Medical, Inc., for their support of the C. Walton Lillehei Point/Counterpoint Debate
Medtronic for their support of the Donald B. Doty Education Award

SPONSORSHIPS

Silver Level
Medtronic Cardiac Surgery
St. Jude Medical Inc.
Corporate Level
Maquet

EXHIBITING COMPANIES

AtriCure, Inc. Merit Medical Systems
ATS Medical, Inc. Neomend, Inc.
Baxter Healthcare Olympus America, Inc.
Biomet Microfixation On-X Technologies, Inc.
Cardiac Assist, Inc. Scanlan International, Inc.
Cormatrix Cardiovascular, Inc. Sorin Group
Covidien St. Jude Medical
Cryolife, Inc. Synovis Surgical Innovations
Genesee BioMedical, Inc. Synthes CMF
KLS Martin, LP Thoratec Corporation
LifeNet Health TKO Surgical, Inc.
MAQUET Cardiovascular
Medtronic Inc.
GUIDELINES FOR SPEAKERS AND DISCUSSANTS:

The Program Committee has determined that no slides are to be included in either the invited discussion or spontaneous discussion.

1. Scientific Session speakers will be allowed ten minutes for their presentations, and primary discussants will be allowed two minutes. Concurrent Forum speakers will be allowed five minutes for their presentations.

2. Speakers are requested to present their PowerPoint Presentations in the Speaker Ready Room located in the N.R. Crump room, located across from the Scientific Session room, at least 30 minutes prior to the opening of the session at which they are to present (presentation slides can be turned in as early as Wednesday, June 24). All presentations must be submitted in PowerPoint format only. Slides should be in order and marked with a speaker label, which will be available in the Speaker Ready Room. Speakers with a disclosure will be asked to state the nature of their disclosure prior to the presentation. No personal laptops will be allowed at the podium.

3. Discussion of Papers: Only members of the Association and invited guests have the privilege of discussing papers. Non members may discuss a paper at the invitation of a member. All discussants should register with the Secretary in the science room (Van Horne Ballroom A) prior to the opening of the session during which the paper is to be presented. All discussions will be presented from floor microphones.

4. In publication, it is customary to group discussions together on a series of papers. Transcription of the discussions will be forwarded to discussants for review and correction. Any delay in the return of corrected discussions means that publication of all papers on the subject will be held up. Such a delay is manifestly unfair to those who are conscientious in the prompt submission of their remarks. Unreasonable delay will preclude publication.
• Discuss current basic science investigations relating to advances in the treatment and management of cardiothoracic and/or congenital heart disease patients and conditions; and

• Discuss current investigative studies in clinical outcomes for patients with surgical cardiothoracic and/or congenital heart disease disorders or pathologies.

1. **Aortic Cusp Extension Valvuloplasty in Children and Adolescents: Long Term Results and Freedom from Aortic Valve Replacement**
   
   Anastasios C. Polimenakos¹, Shyam Sathanandam², Chawki el Zein¹, David Roberson¹, Andrew Griffin¹, Mary J. Barth¹, Robert S.D. Higgins ¹, Michel N. Ilbawi¹,
   
   ¹The Heart Institute for Children at Advocate Children’s Hospital/Rush University Medical Center, Chicago, IL; ²The Heart Institute for Children at Advocate Children’s Hospital, Chicago, IL, ³Rush University Medical Center, Chicago, IL
   
   DISCUSSANT: ROSS M. UNGERLEIDER

2. **Perioperative Outcomes of Video-Assisted (VATS) Resection for Lung Cancer Compared to Open Thoracotomy: An Analysis of Data from the American College of Surgeons Oncology Group (ACOSOG) Z0030 Clinical Trial**
   
   Walter Scott¹, Mark Allen¹, Bryan Meyers¹, Paul Decker⁴, Joe B. Putnam²
   
   ¹Fox Chase Cancer Center, Philadelphia, PA; ²Mayo Clinic, Rochester, MN; ³Washington University of St. Louis, St. Louis, MO; ⁴Mayo Clinic, Rochester, MN; ⁵Vanderbilt University, Nashville, TN
   
   DISCUSSANT: JOHN D. MITCHELL

3. **Long Term Outcome Following the Bentall Procedure—Are Valve-Sparing Procedures in Adults Really Better?**
   
   Christian D. Etz, Stefano Zoli, Robert M. Brenner, Fabian Roeder, Carol A. Bodian, Gabriele DiLuozzo, Randall B. Grieppe*
   
   Mount Sinai School of Medicine, New York, NY
   
   DISCUSSANT: R. SCOTT MITCHELL

* WTSA Member

**PRESIDENTIAL ADDRESS**

Van Horne Ballroom A

**Eulogy for Paul A. Ebert**, Van Horne Ballroom A

Delivered by Edward D. Verrier

**Eulogy for Harold V. Liddle**, Van Horne Ballroom A

Delivered by Kent W. Jones

**SCIENTIFIC SESSION II**

Van Horne Ballroom A

Moderators: Thomas A. Burdon
J. Scott Millikan

(10 minutes presentation, 10 minutes discussion)

Learning objectives for this session are the same as those for Scientific Session I, on pages 21–22.

4. **Focused Simulation in Coronary Artery Anastomosis Early in Residency Training**
   
   James I. Fann*, John H. Calhoon¹, Andrea J. Carpenter¹, Walter H. Merrill¹, John W. Brown¹, Robert S. Poston¹, Maziyar Kalani¹, Gordon F. Murray¹, George L. Hicks, Jr.*, Richard H. Feins²
   
   ¹Stanford University and VA Palo Alto, Palo Alto, CA; ²University of Texas HSC, San Antonio, TX; ³University of Cincinnati, Cincinnati, OH; ⁴Indiana University, Indianapolis, IN; ⁵Boston University, Boston, MA; ⁶Stanford University, Stanford, CA; ⁷West Virginia University, Morgantown, WV; ⁸University of Rochester, Rochester, NY; ⁹University of North Carolina, Chapel Hill, NC
   
   DISCUSSANT: CRAIG H. SELZMAN

* WTSA Member
5. **Inhibition of Group Ila Secretory Phospholipase A 2 Suppresses Proliferation in Human Esophageal Adenocarcinoma Cells**  
   David C. Mauchley, Xianzhong Meng, David A. Fullerton*, Michael J. Weyant*  
   University of Colorado, Aurora, CO  
   **DISCUSSANT: ROSS M. BREMNER**

6. **Thoracic Endovascular Aortic Repair (TEVAR): Evolution of Therapy, Patterns of Use and Results in 450 Cases**  
   Hospital of the University of Pennsylvania, Philadelphia, PA  
   **DISCUSSANT: D. CRAIG MILLER**

7. **Transapical Transcatheter Aortic Valve Implantation: Up to 38 Month Follow-Up in 65 Patients**  
   St. Paul's Hospital, University of British Columbia, Vancouver, BC, Canada  
   **DISCUSSANT: MICHAEL J. MACK**

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**CONTROVERSIES IN THORACIC SURGERY**

**Van Horne Ballroom A**

**The Time is Now for Cardiac and Thoracic Surgery to Part Ways**

Moderator: Douglas E. Wood  
Pro: David Latter  
Con: Robbin G. Cohen

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**At the conclusion of this session, participants will be able to:**

- Understand the basic training requirements for and differences between the preparation of adult cardiac specialty surgeons and general thoracic specialty surgeons;
- Be afforded greater insight into the historical underpinnings of the specific training schemata for adult cardiac versus general thoracic surgeons; and
- Discuss the advantages/disadvantages of a single purpose training regimen for both adult cardiac and general thoracic surgeons versus the creation of separate and distinct training and accreditation protocols for the two different specialties.

12:30 pm  
**ADJOURN**

12:45 pm – 5:45 pm **KANANASKIS RIVER RAFTING**, Transportation to Depart from the Stanley Thompson Wing

1:00 pm – 5:45 pm **LAKE LOUISE SIGHTSEEING TOUR**, Transportation to Depart from the Stanley Thompson Wing

6:30 pm – 10:00 pm **MEDIEVAL NIGHT THEME DINNER**, Riverview Lounge/Alberta Room

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* Samson Resident Prize Essay  
* WTSA Member  
** Separate Subscription Required
FRIDAY, JUNE 26, 2009

6:00 am – 12:00 pm  REGISTRATION, Van Horne Ballroom Foyer

6:00 am – 12:00 pm  SPEAKER READY ROOM, N.R. Crump

6:30 am – 7:50 am  SIMULTANEOUS BREAKFAST SESSIONS

A)  Adult Cardiac Session**, D.C. Coleman

Controversies in Cerebral Protection During Cardiac Surgery
Roderick MacArthur

At the conclusion of this session, participants will be able to:
• Engage in scholarly and dynamic discussions on the various mechanisms and protocols in current use for cerebral protection during extensive cardiac surgery;
• Identify new scientific and clinical information relevant to cerebral protection during cardiac surgery; and
• Understand the historical perspective on the advances seen in cerebral protection during cardiac surgery.

B)  General Thoracic Session**, Sir Edward Beatty

Is Very Early Esophageal Cancer a Surgical Disease?
Ross M. Bremner

At the conclusion of this session, participants will be able to:
• Clearly understand the current assessment of whether very early esophageal cancer is a surgical disease or if it can be treated through chemotherapy and/or radiation treatment alone and without surgical intervention;
• Discuss current studies in clinical outcomes for patients with very early stage esophageal cancer and the variety of treatment protocols; and

C)  Congenital Heart Disease Session**, Baron Shaughnessy

Hybrid Treatments of Congenital Heart Disease
Gordon A. Cohen

At the conclusion of this session, participants will be able to:
• Consider the wide variety of hybrid treatment options of congenital heart disease;
• Engage in scholarly and dynamic discussions of the advantages/disadvantages of the various options available to the surgeon; and
• Become familiar with the appropriate therapies/protocols for the treatment of congenital heart disease.

7:00 am – 11:00 am  FAMILY HOSPITALITY, Ivor Petrak Room

7:30 am – 8:00 am  CONTINENTAL BREAKFAST, VISIT EXHIBITS, Van Horne Ballroom BC

8:00 am – 8:50 am  POSTGRADUATE COURSE

Van Horne Ballroom A
Sponsored by: White Memorial Medical Center and Foundation – Lyman A. Brewer, III, Fund

Cardiac Surgery and Translational Research—A Critical Partnership in Critical Condition
Francis G. Spinale
Medical University of South Carolina, Charleston, SC

At the conclusion of this session, participants will be able to:
• Gain an appreciation for the historical background of the interaction between cardiomyopathy and heart failure;

** Separate Subscription Required
• Understand the importance of the results to date of the current clinical outcome studies related to cardio-myopathy and heart failure; and
• Discern the differences among patient cohorts experiencing cardiomyopathy or heart failure and learn the various options available for the management and surgical treatment of patients with same.

8:50 am – 10:30 am  SCIENTIFIC SESSION III

Van Horne Ballroom A

Moderators: Gordon A. Cohen
Ross M. Bremner
(10 minutes presentation, 10 minutes discussion)

Learning objectives for this session are the same as those for Scientific Session I, on pages 21–22.

8. + Is Anticoagulation Necessary in Patients with Bioprosthetic Aortic Valves in Normal Sinus Rhythm?
Andrew W. ElBardissi, Daniel J. DiBardino, Michael Yamashita, Zain Khalpey, Lawrence H. Cohn*
Brigham and Women’s Hospital, Boston, MA
DISCUSSANT: STEVEN W. GUYTON

9. + Size Matters: A Comparison of T1 and T2 Peripheral Non-Small Cell Lung Cancers Treated with Stereotactic Body Radiation Therapy (SBRT)
Neal E. Dunlap, James M. Larner, Paul W. Read, Benjamin D. Kozower, Christine L. Lau, Ke Sheng, David R. Jones
University of Virginia, Charlottesville, VA
DISCUSSANT: RICHARD I. WHYTE

10. The Impact of Induction Therapy on Morbidity and Operative Mortality After Resection of Primary Lung Cancer
Nathaniel R. Evans, III*, Shuang Li, Cameron D. Wright*, Mark S. Allen*, Henning A. Gaissert*
1Massachusetts General Hospital, Boston, MA; 2Duke University, Durham, NC; 3Mayo Clinic, Rochester, MN
DISCUSSANT: ROBERT J. CERFOJO

11. Twenty Year Experience with Urgent Percutaneous Cardiopulmonary Bypass for Salvage of Potential Survivors of Refractory Cardiovascular Collapse
Walter P. Dembitsky*, Koteswara R. Alla, Bryan Ortiz, Dale Glaser, Cynthia Walsh, Suzanne Chillcott, Marcia Stahovich, Robert Adamson, Sam Baradarian, Joe Chammas, Brian Jaski
Sharp Memorial Hospital, San Diego, CA
DISCUSSANT: JOSEPH C. CLEVELAND, JR.

12. Midterm Outcomes of Myocardial Revascularization in Children
Nicola Viola, Abdullah A. Alghamdi, Osman O. Al-Radi, William G. Williams, John G. Coles, Glen S. Van Andel, Christopher A. Caldarone
Hospital for Sick Children, Toronto, ON, Canada
DISCUSSANT: CHRISTOPHER T. SALERNO

10:30 am – 11:00 am  COFFEE BREAK, VISIT EXHIBITS, Van Horne Ballroom BC

11:00 am – 12:00 pm  SCIENTIFIC SESSION IV

Van Horne Ballroom A

Moderators: Ross M. Ungerleider
John D. Mitchell
(10 minutes presentation, 10 minutes discussion)

Learning objectives for this session are the same as those for Scientific Session I, on pages 21–22.

* Samson Resident Prize Essay
* WTSA Member
13. Outcomes in Lung Cancer Patients Initially Refused Operation
David A. Edelman, Frank Baciewicz, Jr.
Wayne State University, Detroit, MI
DISCUSSANT: PAUL H. SCHIPPER

14. Outcomes of Deliberate Nonoperative Management for Blunt Thoracic Aortic Injury in Trauma
Anthony D. Caffarelli, Hari R. Mallidi, Paul M. Maggio, David A. Spain, Mary Anne Purtill, Michael P. Fischbein, Robert C. Robbins*, Phillip E. Oyer, Bruce A. Reitz*, D. Craig Miller*, R. Scott Mitchell*
Stanford University, Stanford, CA
DISCUSSANT: TIMOTHY L. VAN NATTA

15. Is the “Sterile Cockpit” Concept Applicable to Cardiovascular Surgery? Critical Intervals or Critical Events?
Sarah Henrickson¹, Rishi Wadhera¹, Douglass Wiegmann², Thoralf M. Sundt, III¹
¹Mayo Clinic, Rochester, MN; ²University of Wisconsin, Madison, WI
DISCUSSANT: JAMES I. FANN

12:00 pm
ADJOURN

1:00 pm
GOLF TOURNAMENT**, Stanley Thompson Course

2:00 pm
TENNIS TOURNAMENT**, Tennis Center

EVENING—FREE
CF4. The Successful Application of Simulation-Based Training in Thoracic Surgery Residency
Harold M. Burkhart, Jeffrey Riley, Sarah Hendrickson, George Glenn, James Lynch, Jackie Arnold, Hartzell Schaff, Thoralf Sundt
Mayo Clinic, Rochester, MN

CF5. The Implementation of a Comprehensive Clinical Protocol Improves Long Term Success Following Surgical Treatment of Atrial Fibrillation
Niv Ad, Linda Henry, Sharon Hunt, Lori Stone
Inova Heart and Vascular Institute, Falls Church, VA

CF6. Selective Endothelin Receptor Type-A Inhibition in Cardiac Surgery Subjects with Pre-Existing LV Dysfunction: Influence on Early Post-Operative Hemodynamics
John M. Toole1, John S. Ikonomidis*, Wilson Y. Szeto1, James L. Zellner1, John Mulcahy1, Rachael L. Deardorff1, Theresa A. Brinsa1, Francis G. Spinale1
1Medical University of South Carolina, Charleston, SC; 2University of Pennsylvania, Philadelphia, PA; 3University of Tennessee at Chattanooga, Chattanooga, TN

CF7. Ventricular Restraint Decreases RV Diastolic Compliance and Prevents RV Dilatation in Heart Failure
Lawrence S. Lee, Ravi K. Ghanta, Vakhtang Tchantchaleishvili, Daihei Wang, Suyog Mokashi, Rita G. Laurence, O. Coelho-Filho, Raymond Kwong, Ralph M. Bolman, Lawrence H. Cohn*, Frederick Y. Chen
Brigham and Women's Hospital, Boston, MA

CF8. Mid Term Results of Transapical Aortic Valve Replacement via real-time MRI Guidance
Keith A. Horvath, Dumitru Mazlu, Michael Guttmann, Ming Li
National Institutes of Health, Bethesda, MD

* WTSA Member
CF13. Prospective, Randomized Comparison Between T2 and T3 Thoracoscopic Sympatheticotomy for Disabling Palmar Hyperhidrosis
Fritz J. Baumgartner1,2, Maria Reyes1, Alicia Iglesias1, Elizabeth Reyes1, Grant Sarkisyan1
Surgery Associates, Los Alamitos, CA; 2Doctors Outpatient Surgery Center, Fountain Valley, CA

Keith D. Coon, Landon J. Inge, Kristen Swetel, Jamie DeChon, Michael A. Smith, Ross M. Bremner*
St. Joseph’s Hospital and Medical Center, Phoenix, AZ

CF15. Should Lung Transplantation Be Performed for Patients on Mechanical Respiratory Support? The U.S. Experience
David P. Mason, Lucy Thuita, Edward R. Nowicki, Sudish C. Murthy, Gosta B. Pettersson, Eugene H. Blackstone
Cleveland Clinic, Cleveland, OH

CF16. Radiofrequency Ablation (RFA) for Barrett’s and Low Grade Dysplasia in Combination with an Antireflux Surgery; a New Paradigm
Ricardo Santos1, Costas Bizekis2, Michael Ebright, Michael DeSimone1, Benedict Daly1, Hiran C. Fernando1
1Boston Medical Center, Boston, MA; 2NYU Medical Center, New York, NY

CF17. Re-Coarctation Following Stage 1 Reconstruction Does Not Adversely Affect Survival or Outcome at Fontan Completion
Jean A. Ballweg1, Troy E. Dominguez1, Chitra Ravishankar1, Peter J. Gruber1, Gil Wernovsky1, Jonathan J. Rome1, Matthew J. Gillespie1, J. William Gaynor1, Susan C. Nicolson1, Thomas L. Spray1, Sarah Tabbutt2
1Children’s Hospital of Philadelphia, Philadelphia, PA; 2University of California San Francisco, San Francisco, CA

CF18. Atrioventricular Valve Repair in Patients with Functional Single Ventricle
Tomohiro Nakata, Yoshifumi Fujimoto, Keiichi Hirose, Masaki Osaki, Yuko Tosaka, Yujirou Ide, Maiko Tachi, Kisaburo Sakamoto
Shizuoka Children’s Hospital, Shizuoka, Japan

CF19. Total Anomalous Pulmonary Venous Connection: Results of Surgical Repair of 100 Patients at a Single Institution
Angela M. Kelle1, Carl L. Backer1, Jeffrey G. Gossett, Sunjay Kaushal1, Constantine Mavroudis1
1Children’s Memorial Hospital, Chicago, IL; 2Cleveland Clinic, Cleveland, OH

* WTSA Member
CF20. Extracardiac Fontan: Comparison of Fenestrated with non Fenestrated Patients
Andrew C. Fiore, Mark Ruzmetov, Corinne Tan, Mark D. Rodefeld, Mark W. Turrentine, John W. Brown
1St. Louis University School of Medicine, St. Louis, MO; 2Indiana University School of Medicine, Indianapolis, IN

CF21. Impact of Preoperative Enteral Feeding on Perioperative Outcomes in Patients with Hypoplastic Left Heart Syndrome
Christopher D. Derby, Dore Klenk, Christian Pizarro Alfred I. duPont Hospital for Children, Wilmington, DE

CF22. Plasma Proteolytic Profiles in Pediatric Dilated Cardiomyopathy
Tain-Yen Hsia, Jeremy M. Ringewald, Robert E. Stroud, Scott T. Reeves, Nidhi Kumar, Jeffrey A. Jones, John S. Ikonomidis*, Francis G. Spinale Medical University of South Carolina, Charleston, SC

CF23. Extended Donor Ischemic Time Is Not Associated with Poor Outcome in Pediatric Heart Transplantation
Francisco Gensini, Justin Linam, Yuk Law, Lester Permut, Michael McMullan, Andrea Morsch, Robert Boucek, Gordon Cohen Seattle Children’s, Seattle, WA

CF24. Impact of Evolving Surgical Strategy on Clinical Outcomes in Patients with Bilateral Superior Vena Cava Undergoing Bidirectional Cavopulmonary Shunt
Osami Honjo, Kim-Chi D. Tran, Zhongdong Hua, Priya Sapra, Ganeshakrishnan K. Iyer, Christopher A. Caldarone, Glen S. Van Arsdell The Hospital for Sick Children, Toronto, ON, Canada

7:00 am – 11:00 am FAMILY HOSPITALITY, Ivor Petrak Room
8:20 am – 8:30 am Eulogy for Richard P. Anderson and Posthumous Presentation of David J. Dugan Award
Delivered by John R. Benfield

8:30 am – 9:50 am SCIENTIFIC SESSION V
Van Home Ballroom A
Moderators: Michael J. Weyant Arvind Koshal
(10 minutes presentation, 10 minutes discussion)
Learning objectives for this session are the same as those for Scientific Session I, on pages 21–22.

16. Validating the Use of siRNA as a Novel Technique for Cell Specific Target Gene Knockdown in Lung Ischemia-Reperfusion Injury
John Keech, Elizabeth FitzSullivan, Patrick Wolf, Heather Merry, Michael Mulligan University of Washington, Seattle, WA
DISCUSSANT: ALEC PATTERSON

17. Is Robotic Mitral Valve Repair a Reproducible Approach?
Alfredo Trento, Wen Cheng, Michele A. De Robertis, James Mirocha, Robert M. Kass, Gregory P. Fontana Cedars Sinai Medical Center, Los Angeles, CA
DISCUSSANT: JAMES M. BROWN

* WTSA Member
+ Samson Resident Prize Essay
18. VATS Anatomic Lung Resection for Stage I Non-Small Cell Lung Cancer (NSCLC): VATS Segmentectomy vs. VATS Lobectomy
Matthew J. Schuchert, Brian L. Pettiford, Arman Kilic, Arjun Pennathur, Raphael R. Pereira, Marco Santana, James R. Landreneau, Joshua P. Landreneau, David O. Wilson, James D. Luketich, Rodney J. Landreneau
Heart, Lung and Esophageal Surgery Institute; University of Pittsburgh Medical Center, Pittsburgh, PA
DISCUSSANT: DOUGLAS E. WOOD

19. A UNOS Analysis of Heart Transplantation in Adults with Congenital Heart Disease: Outcomes and Factors Associated with Mortality and Retransplantation
Tara Karamlou1, Jennifer Hirsch1, Richard G. Ohye1, Robert Gajarski1, Edward L. Bove1, Eric J. Devane1, Karl F. Welke*2
1University of Michigan, Ann Arbor, MI; 2Oregon Health and Science University, Portland, OR
DISCUSSANT: MAX MITCHELL

9:50 am – 10:10 am COFFEE BREAK, VISIT EXHIBITS, Van Horne Ballroom BC

10:10 am – 11:10 am SCIENTIFIC SESSION VI
Van Horne Ballroom A
Moderators: Robert C. Robbins, Patricia A. Thistlethwaite
(10 minutes presentation, 10 minutes discussion)
Learning objectives for this session are the same as those for Scientific Session I, on pages 21–22.

20. Incidence and Outcomes of Percutaneous Coronary Intervention and Coronary Artery Bypass Grafting in Patients with Diabetes and Multi-vessel Coronary Artery Disease
Nahush A. Mokadam1, Rayland Melford, Jr.1, Charles Maynard1, Richard Goss1, Douglas Stewart1, Mark Reisman1, Gabriel S. Aldea*1
1University of Washington, Seattle, WA; 2Swedish Medical Center, Seattle, WA
DISCUSSANT: JAMES M. MAXWELL

21. Esophagectomy Following Previous Antireflux Surgery
Mayo Clinic, Rochester, MN
DISCUSSANT: MICHAEL J. WEYANT

22. Post Acute Transmurality of Bipolar Radiofrequency in the Clinical Settings: An Electrophysiological Study
Stefano Benussi1, Andrea Galanti1, Valerio Zerbi1, Massimo Mariani1, Ottavio Alfieri1
1Hospital San Raffaele, Division of Cardiac Surgery, Milano, Italy 2Thorax Centrum Twente, Enschede, Netherlands
DISCUSSANT: KENT W. JONES

11:10 am – 12:00 pm C. WALTON LILLEHEI POINT/COUNTERPOINT SESSION
Van Horne Ballroom A
Graduating Cardiothoracic Surgeons Should Get a Learner’s Permit, Not a Driver’s License
Moderator: Arvind Koshal
Pro: Ross M. Ungerleider
Con: Edward D. Verrier
* Samson Resident Prize Essay
* WTSA Member
At the conclusion of this session, participants will be able to:

- Appreciate two dramatically different opinions, supplemented by statistically significant supportive data, as to why surgeons graduating from cardiothoracic residency training programs should be granted immediate operating privileges and ABTS Board-approved licensure to perform cardiothoracic surgical procedures at will;
- Understand the ramifications of allowing graduating cardiothoracic surgeons carte blanche operating privileges at institutions which may or may not be able to actively monitor the progress and operational experience of these graduates; and
- Consider the differences of providing full privileges to this cohort of graduating surgeons versus a limited and incremental level of privileges at various academic and or teaching hospitals and/or community hospitals.

12:00 pm – 12:30 pm **ANNUAL BUSINESS MEETING** (Members Only)
Van Horne Ballroom A

12:30 pm – 2:00 pm **FAMILY LUNCHEON**, Upper Bow Valley Terrace

7:00 pm – 10:00 pm **KIDS BANQUET**, Ivor Petrak Room

7:00 pm – 11:00 pm **PRESIDENT’S RECEPTION AND BANQUET**
*(Black Tie Optional)*
Reception: Riverview Lounge
Banquet: Cascade Ballroom
from valve replacement are not, yet, well defined. A study was undertaken to investigate outcomes.

METHODS: From July 1987 to November 2008, 142 patients younger than 19 years of age underwent ACEV in the form of pericardial cusp extension. From the available follow-up data recurrent aortic regurgitation or stenosis or both (from previous congenital aortic stenosis with or without bicuspid aortic valve) was the diagnosis in 135 cases and 7 had other diagnosis. Median follow-up was 14.4 years (0.1 to 21.4). Long-term mortality and freedom from Ross procedure or other valve replacement were studied.

RESULTS: There were no early, intermediate or late deaths. Mean z-scores of left ventricular end-diastolic dimension, aortic annulus, aortic sinus diameter and sinotubular junction diameter prior to aortic valve replacement were 4.2 ± 3.1, 2.3 ± 1.25, 4.4 ± 1.2, 1.84 ± 1.28, respectively. In 25 of 142 ACEV (17.6%) Ross operation was performed. Other aortic valve replacement was undertaken after 15 ACEV (10.6%). Freedom from any type of aortic valve replacement at 20 years was 71.83 ± 3.77%. In particular, freedom from Ross procedure at 20 years was 82.39 ± 3.2% and from other aortic valve replacement 89.44 ± 2.58%.

CONCLUSIONS: Aortic cusp extension valvuloplasty is a safe and effective surgical option with excellent survival and good long-term outcomes in children and adolescents. It provides acceptable durability and satisfactory freedom from aortic valve replacement.

2. Perioperative Outcomes of Video-Assisted (VATS) Resection for Lung Cancer Compared to Open Thoracotomy: An Analysis of Data from the American College of Surgeons Oncology Group (ACOSOG) Z0030 Clinical Trial

Walter Scott1, Mark Allen2, Bryan Meyers3, Paul Decker4, Joe B. Putnam5

1Fox Chase Cancer Center, Philadelphia, PA; 2Mayo Clinic, Rochester, MN; 3Washington University of St. Louis, St. Louis, MO; 4Mayo Clinic, Rochester, MN; 5Vanderbilt University, Nashville, TN

DISCUSSANT: JOHN D. MITCHELL

BACKGROUND: The benefits of VATS lobectomy compared to thoracotomy and open lobectomy remain controversial. We compared the perioperative short term outcomes from participants that were enrolled in a randomized trial comparing lymph node sampling versus mediastinal lymph node dissection for early stage lung cancer who underwent either VATS lobectomy or thoracotomy and open lobectomy.

METHODS: Prospectively collected data were analyzed from 964 patients who underwent lobectomy, segmentectomy and bilobectomy as participants in ACOSOG Z0030. A propensity score for choice of treatment approach (VATS versus open) was constructed from clinical and tumor characteristics (age, gender, histology, performance status, tumor location, and T1 versus T2). Propensity scores were used to estimate the adjusted risks of short term outcomes of surgery. Patients were classified into 5 equal-sized groups and compared using conditional logistic regression or repeated measures ANOVA. Two-sided p-values <0.05 were considered statistically significant.

RESULTS: 752 patients (66 VATS and 686 open) were included in the analysis based on the propensity score stratification. Perioperative outcomes are shown in Table 1.

CONCLUSIONS: After adjusting for preoperative differences between groups using propensity scoring, patients undergoing VATS resection experienced fewer serious respiratory complications, earlier removal of chest tubes and shorter length of stay than patients undergoing open thoracotomy and resection. These data support the assessment of VATS lobectomy as safe in patients with resectable lung cancer. Long term follow-up data are needed to determine oncologic equivalency of VATS compared to open lobectomy.
Table 1. Values Are Median; Range Unless Specified by n (%)

<table>
<thead>
<tr>
<th>Perioperative Outcome</th>
<th>VATS (n = 66)</th>
<th>Open (n = 686)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative time, minutes</td>
<td>117.5; 61–450</td>
<td>171.5; 40–425</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Lymph nodes retrieved</td>
<td>15; 5–48</td>
<td>19; 2–83</td>
<td>0.147</td>
</tr>
<tr>
<td>R1/R2 resection, n (%)</td>
<td>0 (0)</td>
<td>16 (2.3)</td>
<td>0.368</td>
</tr>
<tr>
<td>Chest tube drainage &gt;7 days, n (%)</td>
<td>1 (1.5)</td>
<td>74 (10.8)</td>
<td>0.029</td>
</tr>
<tr>
<td>Atelectasis requiring bronchoscopy, n (%)</td>
<td>0 (0)</td>
<td>43 (6.3)</td>
<td>0.035</td>
</tr>
<tr>
<td>Chest tube duration, days</td>
<td>3; 0–25</td>
<td>5; 1–36</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chest tube drainage, ml</td>
<td>987; 140–3382</td>
<td>1504.5; 8–25139</td>
<td>0.001</td>
</tr>
<tr>
<td>Hospital length of stay, n (%)</td>
<td>4.5; 1–19</td>
<td>7; 0–99</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Operative mortality, n (%)</td>
<td>0 (0)</td>
<td>11 (1.6)</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**BACKGROUND:** Valve-sparing procedures have progressively been recommended for aortic valve and root/ascending aorta repair, especially in younger patients. The durability and long-term outcome of valve-sparing operations has, however, never been shown to be superior to the Bentall procedure.

**METHODS:** We have followed a cohort of 142 consecutive, elective patients— all <65 years—who underwent a Bentall operation without concomitant procedures between 1989 and 2000. 85% were men; median age was 46 (13–64) years. Degenerative disease of the aorta was the most common indication for operation (86%, including 46% with bicuspid aortic valve); 8% had chronic dissection, and 6% atherosclerotic aneurysms. The ascending aorta was replaced in 94 patients (66%); 45 patients (32%) underwent hemiarch replacement, and in 3 (2%) the entire arch was replaced. A mechanical valve was used in the conduit in 88%, and a biologic valve in 12%.

**RESULTS:** Follow up was 100% complete, with a median of 10.9 (6.4–19.5) years. Survival was >95% after five, 91% after ten and 88% after twelve years (figure). The linearized death rate was 1.2% per patient-year (table). There was no significant difference in overall survival after the Bentall procedure compared to a sex- and age-matched normal population (figure). Twenty patients (14%) experienced adverse events: all episodes of bleeding occurred in patients with a mechanical valve. One-third of all bleeding events occurred within the first postoperative year; thereafter, the bleeding rate declined to 1.1% per patient-year (during years 1–5) and thereafter to 0.5% per patient-year. Freedom from adverse events (table) was 87% after five, 86% after ten and 84% after twelve years. The probability of suffering a thrombembolic stroke declined after the first year (1.4% per patient-year) to <0.2% per patient-year thereafter. The reoperation rate was <0.1% per patient-year (table).
CONCLUSION: Long-term survival after the Bentall procedure appears superior to that of contemporaneous published valve sparing studies (David TE et al, JCTVS 2006: N = 220 patients, mean age: 46 ± 15 years, follow-up: 5.2 ± 3.7 years; 5-year survival: 94%, 10-year survival: 88%). The stroke rate appears comparable (0.2% per patient year; table). Bleeding events affected chiefly patients with mechanical valves during the first postoperative year, and likely reflects a learning curve in anticoagulation management. An increased risk of endocarditis after the Bentall operation seems to be outweighed by a greater risk of myocardial infarction after valve sparing procedures. Aortic insufficiency—virtually negligible in patients after a Bentall procedure—occurs in about 15% of patients after valve-sparing even in experienced centers, and consequently the risk of requiring reoperation after valve-sparing surgery may be as much as 10-fold higher than after a Bentall procedure. In the adult population in whom anticoagulation is absolutely contraindicated the Bentall procedure may be as good if not better than valve-sparing procedures.
4. Focused Simulation in Coronary Artery Anastomosis Early in Residency Training

James I. Fann*, John H. Calhoon¹, Andrea J. Carpenter², Walter H. Merrill³, John W. Brown⁴, Robert S. Poston⁵, Maziyar Kalani⁶, Gordon F. Murray⁷, George L. Hicks, Jr.⁸, Richard H. Feins⁹

¹Stanford University and VA Palo Alto, Palo Alto, CA; ²University of Texas HSC, San Antonio, TX; ³University of Cincinnati, Cincinnati, OH; ⁴Indiana University, Indianapolis, IN; ⁵Boston University, Boston, MA; ⁶Stanford University, Stanford, CA; ⁷West Virginia University, Morgantown, WV; ⁸University of Rochester, Rochester, NY; ⁹University of North Carolina, Chapel Hill, NC

DISCUSSANT: CRAIG H. SELZMAN

BACKGROUND: Cardiothoracic surgery trainees may benefit from intensive simulation training early in residency. We evaluated focused training in coronary artery anastomosis using a porcine heart model and portable task station.

METHODS: At the 2-day Boot Camp, 33 first-year cardiothoracic surgery residents participated in a 4-hour session devoted to coronary anastomosis using a porcine heart model with vein grafts and a portable anastomosis task station on which were mounted 4 mm synthetic vessels. After a brief didactic session, each resident performed end-to-side coronary anastomoses using the porcine model and the task station under direct supervision by attending surgeons (6–7 attendings per group of 8–9 residents) with formative feedback. At beginning, mid-point and end of session, performance of components of anastomosis was evaluated using a 3-point rating scale (1 = good: able to accomplish goal without hesitation, showing good progress and flow; 2 = average: able to accomplish goal with hesitation, discontinuous progress and flow; 3 = below average: able to partially accomplish goal with hesitation). Resident progress at beginning and end of session was video recorded and reviewed by three experienced surgeons in a blinded fashion. After the session, the participants completed an exit questionnaire. All residents were given a portable task station at the end of the course for distributed and deliberate practice.

* WTSA Member
RESULTS:
Total number of end-to-side anastomoses using the porcine heart model and the task station ranged from 10 to 18. Performance rating scores based on immediate assessment are noted in the Table. All residents were more confident in their ability to perform coronary anastomosis after the session.

CONCLUSIONS:
In general, the 4-hour focused training using porcine heart model and the task station resulted in improved ability to perform an anastomosis based on immediate assessment and confirmed the residents' confidence that the task station was realistic. All residents were more confident in their ability to perform coronary anastomosis after the session.

Performance Rating Scores Based on Immediate Assessment

<table>
<thead>
<tr>
<th></th>
<th>Beginning</th>
<th>Mid-point</th>
<th>End</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graft orientation</td>
<td>2.30 ± 0.50</td>
<td>1.86 ± 0.46</td>
<td>1.36 ± 0.47</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Bite appropriate</td>
<td>2.29 ± 0.56</td>
<td>1.77 ± 0.50</td>
<td>1.36 ± 0.47</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Spacing appropriate</td>
<td>2.33 ± 0.51</td>
<td>1.89 ± 0.45</td>
<td>1.33 ± 0.46</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Needle holder use</td>
<td>2.20 ± 0.67</td>
<td>1.80 ± 0.51</td>
<td>1.29 ± 0.43</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Use of forceps</td>
<td>2.11 ± 0.58</td>
<td>1.76 ± 0.63</td>
<td>1.50 ± 0.56</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Needle angles</td>
<td>2.44 ± 0.48</td>
<td>1.91 ± 0.49</td>
<td>1.42 ± 0.49</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Needle transfer</td>
<td>2.24 ± 0.49</td>
<td>1.89 ± 0.50</td>
<td>1.58 ± 0.50</td>
<td>p &lt; 0.001</td>
</tr>
<tr>
<td>Suture management and tension</td>
<td>2.33 ± 0.62</td>
<td>1.88 ± 0.52</td>
<td>1.58 ± 0.50</td>
<td>p &lt; 0.001</td>
</tr>
</tbody>
</table>

Data expressed as mean ± SD; paired t-test for beginning vs. mid-point, beginning vs. end, mid-point vs. end.

RESULTS: Total number of end-to-side anastomoses using the porcine heart model and the task station ranged from 10 to 18. Performance rating scores based on immediate assessment are noted in the Table (see above). Review of the video recordings of anastomoses confirmed the performance improvement. Exit questionnaire showed 100% of residents agreed that the task station and porcine model were good methods of training technical skills. All residents considered the porcine model to be realistic and stressed important components of an anastomosis. While nearly all indicated that the task station stressed important components, 61% of residents believed that performing an anastomosis using the task station was realistic. All residents were more confident in their ability to perform coronary anastomosis after the session.

CONCLUSIONS: In general, the 4-hour focused training using porcine heart model and the task station resulted in improved ability to perform an anastomosis based on immediate assessment and confirmed by review of the video record. Simulation with focused training and emphasis on distributed and deliberate practice may be useful in preparing residents for coronary anastomosis in the clinical setting.

BACKGROUND: The incidence of esophageal adenocarcinoma (EAC) is rapidly rising in the western world. This phenomenon is thought to be directly related to gastro-esophageal reflux disease (GERD). We have previously demonstrated in vivo that the enzyme group IIa secretory phospholipase A2 (sPLA2) is necessary for the development of early histologic changes in esophageal mucosa in response to surgically-induced GERD. This enzyme has been found to be overexpressed in esophageal adenocarcinoma but its role is not known. We sought to determine the influence of group IIa sPLA2 on EAC cell proliferation.

METHODS: FLO-1 cells derived from human EAC were subcultured at a density of $2 \times 10^4$ in 96-well plates in Dulbecco's modified Eagle's medium (DMEM) supplemented with 10% fetal calf serum (FCS) and 1% penicillin/streptomycin, and grown for 72 hours at 37°C. Cells were then serum starved for 24 hours to induce cell cycle arrest. After this period, cells were stimulated with acidic medium (pH = 4.5) for 90 minutes in the presence of 0.1–10 µM concentrations of the sPLA2 inhibitor (5-(4-benzyloxyphenyl)-4S-(7-phenylheptanoylamino)-pentanoic acid or vehicle (DMSO). Cells were then allowed to proliferate for six hours in 10% FCS containing medium and assessed for cell number and proliferation with 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) and bromodeoxyuridine (BrdU) incorporation assays respectively. All assays were performed in triplicate. Statistical analysis was determined using student's t-test.

RESULTS: Treatment with the sPLA2 inhibitor resulted in a significant reduction of growth and proliferation of EAC cells compared to controls (Figs. 1 & 2).

* Samson Resident Prize Essay
* WTSAS Member
CONCLUSIONS: Group IIa sPLA₂ appears to play a significant role in the growth and proliferation of human EAC cells. This novel finding implies that sPLA₂ inhibition should be studied further regarding its role as a potential chemopreventative and therapeutic agent in EAC.

BACKGROUND: The introduction of aortic stent grafting in the treatment of thoracic aortic disease has pioneered unique treatment options and has gained rapid clinical adoption despite a paucity of long-term outcome data. The purpose of this analysis is to examine all operations performed using thoracic aortic stents at our institution.

METHODS: 450 operations involving TEVAR were performed from April 1999 until September 2008. Patients were followed in a prospectively collected clinical perioperative registry, and long term outcomes were determined from administrative data sources. Aortic pathologies include aortic aneurysm, acute aortic dissection (type A and B), hybrid arch repairs, reinterventions with additional stents, pseudoaneurysm, chronic type B dissection, traumatic transection, penetrating aortic ulcer, and other unique indications (including ascending aneurysm).

RESULTS: The mean patient age was 70.1 ± 12.6 years and 39.2% (n = 177) were females. Post-operative neurological complications included: permanent paraplegia in 3.54% (n = 16), permanent stroke in 4.2% (n = 19), and reversible spinal cord ischemia in 3.3% (n = 24). Post-operative onset of new hemodialysis occurred in 2.8% of operations (n = 13). Overall 30 day mortality was 8.7% (n = 39). Long term all-cause mortality data was collected for all patients (Table 1).

CONCLUSIONS: Thoracic aortic stent grafting has evolved to be a viable option to complement, augment, or replace traditional treatments for aortic disease. This study illustrates the applicability of this technology in the establishment of new treatment paradigms for the entire spectrum complex aortic pathologies.
Table 1: In-Hospital Mortality and Survival

<table>
<thead>
<tr>
<th>Classification</th>
<th>In-Hospital Mortality</th>
<th>1 Year Survival</th>
<th>3 Year Survival</th>
<th>5 Year Survival</th>
<th>8 Year Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aneurysm</td>
<td>8.2%</td>
<td>8.2% (197)</td>
<td>72% (98)</td>
<td>64% (32)</td>
<td>61% (11)</td>
</tr>
<tr>
<td>Acute Aortic Dissection (A/B)</td>
<td>3.9%</td>
<td>2.6% (59)</td>
<td>88% (14)</td>
<td>57% (10)</td>
<td>50% (13)</td>
</tr>
<tr>
<td>Arch Hybrid</td>
<td>13%</td>
<td>13% (7)</td>
<td>57% (3)</td>
<td>51% (1)</td>
<td>55% (2)</td>
</tr>
<tr>
<td>Reinterventions in Stented Patients</td>
<td>5.3%</td>
<td>0% (4)</td>
<td>56% (3)</td>
<td>56% (3)</td>
<td>56% (3)</td>
</tr>
<tr>
<td>Pseudoaneurysm</td>
<td>0%</td>
<td>0% (6)</td>
<td>51% (6)</td>
<td>51% (6)</td>
<td>51% (6)</td>
</tr>
<tr>
<td>Chronic Type B Dissection</td>
<td>0%</td>
<td>0% (1)</td>
<td>100% (1)</td>
<td>100% (1)</td>
<td>100% (1)</td>
</tr>
<tr>
<td>Traumatic Transection</td>
<td>23.1%</td>
<td>7.7% (9)</td>
<td>76% (1)</td>
<td>76% (1)</td>
<td>76% (1)</td>
</tr>
<tr>
<td>PAU</td>
<td>0%</td>
<td>0% (3)</td>
<td>42% (3)</td>
<td>42% (3)</td>
<td>42% (3)</td>
</tr>
<tr>
<td>Unique Indications</td>
<td>16.7%</td>
<td>16.7% (2)</td>
<td>60% (2)</td>
<td>60% (2)</td>
<td>60% (2)</td>
</tr>
</tbody>
</table>

BACKGROUND: Reported 2 year-survival in patients with severe aortic stenosis who were declined for conventional aortic valve replacement was 19%. This study is to evaluate mid-term clinical outcomes following transapical transcatheter aortic valve implantation (AVI). Since we reported the first case of transapical transcatheter AVI in humans in 2005 and have now completed up to 38 months follow-up on 65 patients. This is to date the longest follow-up on transapical AVI patients.

METHODOLOGY: Between October 2005 and December 2008, 65 patients [40 female (68.5%), 25 male (38.5%)] underwent transapical AVI with either 23 or 26 mm Edwards SAPIEN™ transcatheter aortic bioprostheses through a left mini-thoracotomy. All patients had symptomatic aortic stenosis and significant co-morbidities, and were declined for conventional AVR due to unacceptable operative risks, and were also considered to be non-candidates for transfemoral AVI because of diseased and/or small ilio-femoral arteries or had failed the transfemoral approach. Clinical and echocardiographic follow-up was performed at discharge, 30 days, 6 months, and then annually thereafter. Mean follow-up time was 19.2 ± 1.6 months, and the longest follow-up was 38 months.
RESULTS: Mean age was 80.0 ± 1.1 years and the predicted risks for operative mortality by logistic EuroSCORE and STS risk calculator were 34.9 ± 2.6% and 12.2 ± 1.0%, respectively. Valves were successfully deployed and well seated in the aortic annulus in 64 patients (98% success rate). In 1 patient, a second valve was implanted at the same time. The overall 30-day mortality was 18.5% (12 events), 33.3% (5 events) in the first 15 patients (learning curve) and 14% in the remainder. Overall 1-, 2-, and 3-year survival rates were 81.5 ± 4.8%, 72.1 ± 5.6%, and 65.8 ± 6.2%, respectively. When the first 15 patients were excluded because of the significant learning curve, the 1-, 2-, and 3-year survival rates were 79.8 ± 5.7%, 74.7 ± 6.4%, and 68.7 ± 7.1%, respectively. Of the patients who survived 30 days postoperatively, the 1-year survival was 88.4 ± 4.5%. The 2-, and 3-year survival was 80.6 ± 5.9%. There were no late valve-related complications. NYHA class decreased significantly in all patients during the follow-up. The aortic valve area and mean gradient of the aortic bioprostheses remained stable up to 38 months. Trivial to mild paravalvular leaks were common and remained unchanged during the follow-up.

CONCLUSION: Pre-existing comorbidities are the main causes of early and late mortality. Transapical AVI improves patient status by eliminating cardiac symptoms and probably improves survival in patients who were declined for conventional AVR, compared to historical data. Valve- or cardiovascular-related late mortality or morbidity is rare.

** Separate Subscription Required
6:00 am – 12:00 pm  **REGISTRATION**, Van Horne Ballroom Foyer

6:00 am – 12:00 pm  **SPEAKER READY ROOM**, N.R. Crump

6:30 am – 7:50 am  **SIMULTANEOUS BREAKFAST SESSIONS**

A) **Adult Cardiac Session**, D.C. Coleman
   Controversies in Cerebral Protection During Cardiac Surgery
   Roderick MacArthur

B) **General Thoracic Session**, Sir Edward Beatty
   Is Very Early Esophageal Cancer a Surgical Disease?
   Ross M. Bremner

C) **Congenital Heart Disease Session**, Baron Shaughnessy
   Hybrid Treatments of Congenital Heart Disease
   Gordon A. Cohen

7:00 am – 11:00 am  **FAMILY HOSPITALITY**, Ivor Petrak Room

7:30 am – 8:00 am  **CONTINENTAL BREAKFAST, VISIT EXHIBITS**, Van Horne Ballroom BC

8:00 am – 8:50 am  **POSTGRADUATE COURSE**

Van Horne Ballroom A
Sponsored by: White Memorial Medical Center and Foundation – Lyman A. Brewer, III, Fund

Cardiac Surgery and Translational Research—A Critical Partnership in Critical Condition
Francis G. Spinale
Medical University of South Carolina, Charleston, SC

** Separate Subscription Required
BACKGROUND: Current AHA/ACC guidelines recommend anticoagulation in the first 90 postoperative days in patients who undergo bioprosthetic aortic valve implantation. We sought to determine if immediate postoperative anticoagulation was necessary in patients undergoing isolated bioprosthetic aortic valve replacement and who were discharged in normal sinus rhythm.

METHODS: From December 2001 to October 2008 1131 patients underwent bioprosthetic aortic valve implantation. After exclusion of patients who underwent concomitant operations (n = 138, 12%), patients who were anticoagulated preoperatively (n = 2, 0.20%), and those who experienced postoperative persistent atrial fibrillation requiring anticoagulation at discharge (n = 128, 11%), our study base consisted of 861 patients who underwent isolated bioprosthetic valve implantation. Patients were followed for 90 days postoperatively for the incidence of thromboembolism (TE), including stroke, TIA, or peripheral thromboembolic events.

RESULTS: Of the 861 patients in normal sinus rhythm included in this study, 133 (15%) were electively anticoagulated with Warfarin (AC+) postoperatively and 728 (85%) were not given any anticoagulation (AC-). Fifty-four percent (n = 387) of AC- patients were discharged on Aspirin 325 mg/day (ASA). Demographic, hemodynamic, and operative characteristics are shown in Table 1. As demonstrated, patients who received postoperative anticoagulation were older, had a higher incidence of hypertension, and were more symptomatic preoperatively. The 90-day incidence of TE after surgery was 7% (n = 9) in AC+ and 6% (n = 45) in AC- (p = 0.35). A multivariate regression model indicated the most significant predictor of TE in the 90 day postoperative period to be preoperative NYHA class III/IV (OR 1.76, 9% vs. 5%, p = 0.008) heart failure. Patients

DISCUSSANT: STEVEN W. GUYTON

8.1 Is Anticoagulation Necessary in Patients with Bioprosthetic Aortic Valves in Normal Sinus Rhythm?
Andrew W. ElBardissi, Daniel J. DiBardino, Michael Yamashita, Zain Khalpey, Lawrence H. Cohn*
Brigham and Women’s Hospital, Boston, MA

* Samson Resident Prize Essay

* WTSA Member
in NYHA class III/IV heart failure who were discharged on ASA had a lower incidence of TE than those who were not on ASA (OR 0.34, 10% vs. 7%, p = 0.06). A similar trend was not appreciated in NYHA III/IV patients who were discharged on Warfarin postoperatively (OR = 0.62, 7% vs. 6%, p = 0.53).

Table 1: Demographic, Hemodynamic, and Operative Patient Characteristics

<table>
<thead>
<tr>
<th></th>
<th>AC+ (n = 133)</th>
<th>AC– (n = 728)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>74.54 ± 9.1</td>
<td>68.95 ± 13.1</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Hypertension n (%)</td>
<td>109 (81%)</td>
<td>452 (62%)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Diabetes n (%)</td>
<td>24 (18%)</td>
<td>121 (17%)</td>
<td>0.68</td>
</tr>
<tr>
<td>Hyperlipidemia n (%)</td>
<td>92 (69%)</td>
<td>440 (60%)</td>
<td>0.06</td>
</tr>
<tr>
<td>Peripheral vascular disease n (%)</td>
<td>19 (14%)</td>
<td>76 (10%)</td>
<td>0.19</td>
</tr>
<tr>
<td>Cerebrovascular disease n (%)</td>
<td>29 (13%)</td>
<td>83 (11%)</td>
<td>0.29</td>
</tr>
<tr>
<td>NYHA functional status</td>
<td></td>
<td></td>
<td>0.0002</td>
</tr>
<tr>
<td>I</td>
<td>20 (15%)</td>
<td>161 (22%)</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>44 (33%)</td>
<td>330 (45%)</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>60 (45%)</td>
<td>214 (29%)</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>9 (7%)</td>
<td>23 (3%)</td>
<td></td>
</tr>
<tr>
<td>Previous surgical interventions</td>
<td></td>
<td></td>
<td>0.29</td>
</tr>
<tr>
<td>Previous CABG n (%)</td>
<td>18 (14%)</td>
<td>76 (10%)</td>
<td></td>
</tr>
<tr>
<td>Echocardiographic data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ejection Fraction</td>
<td>54 ± 13</td>
<td>58 ± 11</td>
<td>0.007</td>
</tr>
<tr>
<td>Mean PAP</td>
<td>28 ± 12</td>
<td>25 ± 12</td>
<td>0.26</td>
</tr>
<tr>
<td>Aortic Stenosis n (%)</td>
<td>106 (80%)</td>
<td>593 (81%)</td>
<td>0.63</td>
</tr>
<tr>
<td>Aortic gradient</td>
<td>44 ± 20</td>
<td>48 ± 18</td>
<td>0.04</td>
</tr>
<tr>
<td>Moderate or greater Aortic Regurgitation</td>
<td>65 (49%)</td>
<td>343 (47%)</td>
<td>0.7</td>
</tr>
<tr>
<td>Operative characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPB time (minutes)</td>
<td>125 ± 59</td>
<td>111 ± 53</td>
<td>0.02</td>
</tr>
<tr>
<td>Cross-clamp time</td>
<td>80 ± 36</td>
<td>75 ± 36</td>
<td>0.77</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Immediate postoperative anticoagulation after isolated bioprosthetic aortic valve replacement in patients in normal sinus rhythm does not appear to reduce the risk of TE. Current recommendations should be revisited, as the only subset of patients at high risk of TE are those in NYHA III/IV heart failure; these patients may be best treated with ASA rather than Warfarin.
9. Size Matters: A Comparison of T1 and T2 Peripheral Non-Small Cell Lung Cancers Treated with Stereotactic Body Radiation Therapy (SBRT)
Neal E. Dunlap, James M. Larner, Paul W. Read, Benjamin D. Kozower, Christine L. Lau, Ke Sheng, David R. Jones
University of Virginia, Charlottesville, VA
DISCUSSANT: RICHARD I. WHYTE

BACKGROUND: Previous studies of SBRT for non-small cell lung cancer (NSCLC) have combined T1 and T2 tumors and have included both central and peripherally located tumors. The purpose of this study was to compare the outcomes and local control rates of patients with peripheral T1 and T2 NSCLC treated with SBRT.

METHODS: The records of 40 consecutive patients (median age 73, range 54–87) treated with 3 or 5 fraction lung SBRT for peripheral, biopsy-proven clinical stage I NSCLC from March 2005 to January 2008 at a single institution were reviewed. Thoracic surgeons and radiation oncologists saw all patients and co-designed their treatment plans. SBRT was delivered at a median dose of 60 Gy (range, 42–60) prescribed to cover 95% of the planning target volume. Doses to organs at risk were limited based on the RTOG 0236 treatment protocol. Twelve patients had both pre- and post-SBRT PET-CT scans. Median follow was 11 months (range, 2–35). Survival and local control rates were calculated with the Kaplan-Meier method.

RESULTS: Median tumor size was 23 mm (range, 9-50) with 27 (67%) and 13 (33%) having T1 and T2 tumors, respectively. Only 7% (3/40) refused surgery with the remainder being medically inoperable. Twenty-three percent of patients developed post-SBRT chest wall pain. Grade I, II, and III pneumonitis developed in 12%, 2%, and 2% of patients, respectively. Median survival was 11 months for the entire cohort. Relative to their pre-SBRT PET-CT scan 66% (8/12) of patients had a decrease in their tumor post-SBRT SUVmax, while 34% had an increase in their tumor post-SBRT SUVmax. Post-SBRT PET-CT scanning did not accurately predict likelihood of local recurrence. Eight patients (20%) developed metastatic disease independent of their T status. Overall survival for T1 tumors at 1 and 2 years was 93% and 65% and for T2 tumors was 75% and 62%. Local control at one year was worse in T2 tumors (70% vs. 100% for T1 lesions). The average time to local recurrence for T1 and T2 tumors was 16 and 7.5 months, respectively.

CONCLUSIONS: SBRT is well tolerated in inoperable patients with NSCLC. SBRT for T2 NSCLC has a worse intermediate term prognosis and a higher local recurrence rate compared to T1 lesions. In addition, post-SBRT PET-CT scans are not reliable indicators of local control. Tumor size is an important predictor of response to SBRT and should be considered in future clinical trial designs.

* Samson Resident Prize Essay

10. The Impact of Induction Therapy on Morbidity and Operative Mortality After Resection of Primary Lung Cancer
Nathaniel R. Evans, III,1 Shuang Li,2 Cameron D. Wright1, Mark S. Allen1, Henning A. Gaissert1
1Massachusetts General Hospital, Boston, MA; 2Duke University, Durham, NC
DISCUSSANT: ROBERT J. CERFOJO

BACKGROUND: We sought to examine use and impact of chemotherapy and radiotherapy before major elective resection for primary lung cancer in the Society of Thoracic Surgeons’ National General Thoracic Database.

METHODS: Lobectomy and pneumonectomy for primary lung cancer were identified between January 2002 and December 2007. Procedures with missing hospital mortality and length of stay, those treated with chemotherapy or radiation for unrelated disease, and clinical or pathologic M1 disease were excluded. The complication rate was expressed as a composite of 12 major events; prolonged length of stay was defined as >14 days.

RESULTS: In 796 of 8864 procedures (9%), chemotherapy (n = 759) and/or radiotherapy (n = 569) preceded resection. Compared to resection only, patients receiving induction therapy were younger (median age 61.8 vs. 66.9; p < 0.0001), had fewer comorbidities, more reoperative surgery (10.7 vs. 3.95%; p < 0.0001), and higher rates of pneumonectomy (18.2 vs. 5.9%; p < 0.0001) and thoracotomy (84.6 vs. 75.1%; p < 0.0001).

Four hundred twenty-seven patients had clinical N2 disease. Induction therapy in 247 (58%) was associated with lower patient age and comorbidity, with equivalent pneumonectomy rates. Center-specific rates of neoadjuvant therapy for clinical N2 varied from 25 to 89%.

Induction therapy for all stages was associated with longer hospital stay (median length 6 vs. 5 days; p = 0.0012); rates for tracheostomy, wound infection, transfusion, and atelectasis were higher. Table 1 shows differences in hospital mortality, major complications, and prolonged hospital stay.

In clinical N2 disease, mortality, major complication, and prolonged hospital stay rates were comparable between the two groups. Pathologic staging of clinical N2 confirmed N0 in 27.8% (119/426), N1 in 13.1% (56/426), N2 in 49.3% (210/426), and N3 in 0.23% (1/426). A total of 800 patients had pathologic N2 disease, of whom 179 (22.5%) received neoadjuvant therapy.
CONCLUSIONS: A minority of patients receive neoadjuvant chemotherapy or radiation before major lung resection for primary carcinoma. There are marked variations in the use of induction therapy for clinical N2 disease associated with participating centers, comorbidity and patient age. The hospital mortality of lobectomy and pneumonectomy with or without neoadjuvant therapy is low.

Table 1: Event Rates by Treatment

<table>
<thead>
<tr>
<th>Stage</th>
<th>Outcome</th>
<th>Resection Only</th>
<th>Induction Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total N</td>
<td>Event</td>
<td>%</td>
</tr>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8068</td>
<td>148</td>
<td>1.83</td>
</tr>
<tr>
<td></td>
<td>8068</td>
<td>580</td>
<td>7.19</td>
</tr>
<tr>
<td></td>
<td>8068</td>
<td>747</td>
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BACKGROUND: In-hospital cardiac arrest or refractory shock carries a high mortality despite the use of advanced resuscitative measures. We have implemented an in-hospital, nurse based, continuously available percutaneous veno-arterial cardiopulmonary bypass (ECLS) as an adjunct to resuscitation when initial measures are ineffective.

METHODS: In 1986, a system for the rapid initiation of ECLS was created where trained critical care nurses primed an ECLS circuit and in-house physicians percutaneously placed required cannulas. From a prospective registry, we assessed long-term survival (LTS) (greater than thirty days, CPS weaned), short-term survival (up to 30 days, CPS weaned), or death-on-CPS.

RESULTS: One hundred fifty patients (age: 57 ± 17 years) were urgently placed on CPS for cardiac arrest (n = 127) and refractory shock (n = 23). Sixty-nine patients were weaned from CPS and 81 could not be weaned. Overall, 41 patients (27.3%) achieved LTS with a subsequent Kaplan-Meier survival T½ of 6.0 years. Duration of CPS support was 32 ± 38 hours for LTS and 21 ± 38 hours for non-LTS (NS). LTS occurred in 30/124 (24.2%) placed on CPS for witnessed cardiac arrest, 0/3 (0%) for unwitnessed cardiac arrest, and 11/23 (47.8%) for refractory shock (p < 0.05). In patients with CPS initiated in the cardiac catheterization laboratory, LTS was seen in 23/47 (48.9%) versus 18/103 (17.3%) in other locations (p < 0.001). In cardiac arrest patients with documented durations of CPR, LTS was achieved in 16/54 (29.6%) who received less than 30 minutes of CPR, and in 9/54 (16.7%) who received 30 minutes or more of CPR (NS). Most common etiology of death on CPS was refractory cardiac dysfunction (59.5%) and with short-term survival was neurological/pulmonary dysfunction (53.6%). Six patients were bridged to LVAD while five subsequently received heart transplantation. Multivariate analysis revealed only cath lab site of initiation as a significant independent predictor of LTS. (p < .05). Survival was less with ECLS Flow >2L/mim/m². During the 20y experience recipients have become younger, pre arrest insertion more common, time on support longer, and LTS has not changed.

* WTSA Member
CONCLUSIONS: More than half of resuscitated patients weaned from CPS had LTS. Rapid initiation of CPS permits LTS for some in-patients with cardiovascular collapse when initial advanced resuscitation fails. Strategies to improve end-organ function associated with use of CPS should lead to greater LTS. This practical application of inexpensive available technology should be more widely used.

BACKGROUND: Coronary artery bypass is an uncommon operation in the pediatric population. Clinical symptoms can underestimate the severity of the coronary disease and therefore thorough work-up is required. Small coronary artery diameter and the need for conduits suitable for long term growth represent the main technical challenges. This report examines the immediate and mid-term outcomes of children who underwent coronary artery bypass surgery at our institution.

METHODS: Between 1980 and 2008, fourteen patients underwent coronary artery bypass grafting (CABG). The median age was 10 years (range 3–15 years) and the median weight 36 Kg (range 12 to 71 kg). Diagnoses were Kawasaki disease (n = 5), ALCAPA (n = 2), postsurgical (n = 3), previous percutaneous coronary procedure (n = 1) and other (n = 3). All of the children had angiographically proven coronary stenosis: single vessel disease in 2 (14%), double vessel disease in seven (50%), triple vessels disease in 1 (7%), and left main coronary artery involvement in 4 (29%). 9 patients (64%) also had a positive stress test. Half of the patients with positive stress test and positive angiography had no angina or angina-like symptoms. All patients received one or two pedicled mammary artery grafts. Additional saphenous vein grafts (SVG) were used in four. In total, 22 grafts were used. Five patients had associated procedures, three of which involved the coronaries (Table 1).

Basic descriptive analyses were performed including median, means and standard deviations for continuous variables and proportions for categorical variables. Individual patients’ data were tabulated where appropriate.

RESULTS: There were no perioperative deaths. One patient who underwent proximal coronary arterioplasty required emergency CABG on post operative day 1 for early restenosis. Two patients had significant arrhythmias. The median length of hospital stay was eight days (range 3 to 24 days).

Postoperative angiography was performed in five patients (median interval to angiography 2 years–range 1 day to 10 years) based on clinical indications. One patient complaining of severe recurrent angina 12 months after surgery required balloon arterioplasty (PTCA) to a stenosed saphenous vein graft. The remaining four patients presented non-specific changes on routine follow-up stress tests and the subsequent angiograms were negative. Follow up time ranged from 0 to 10 years (median 3.3 years). At most recent follow-up
Table 1. SVD, Single Vessel Disease; DVD, Double Vessel Disease; TVD, Triple Vessel Disease.
LMCA, Left Main Coronary Artery; MV, Mitral Valve; ARR, Aortic Root Replacement.

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (yr)</th>
<th>Weight (Kg)</th>
<th>Symptoms</th>
<th>Stress Test/Myoscan</th>
<th>Angiography</th>
<th>Procedure</th>
<th>Postoperative Angiography</th>
<th>Follow-Up (yrs)</th>
<th>Outcomes</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>14</td>
<td>+</td>
<td>+</td>
<td>DVD</td>
<td>CABG × 2</td>
<td>PTCA to SVG</td>
<td>12</td>
<td>Death</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>38</td>
<td>_</td>
<td>+</td>
<td>TVD</td>
<td>CABG × 3 + RCA Plasty</td>
<td>10</td>
<td>Asymptomatic</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>20.5</td>
<td>n/a</td>
<td>n/a</td>
<td>LMCA</td>
<td>CABG × 1</td>
<td></td>
<td>10</td>
<td>Asymptomatic</td>
</tr>
<tr>
<td>4</td>
<td>12.7</td>
<td>38.8</td>
<td>+</td>
<td>+</td>
<td>LMCA</td>
<td>CABG × 2 + RCA Plasty</td>
<td>4</td>
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<td></td>
</tr>
<tr>
<td>5</td>
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<td>41.5</td>
<td>n/a</td>
<td>n/a</td>
<td>SDV</td>
<td>CABG × 1</td>
<td></td>
<td>6</td>
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</tr>
<tr>
<td>6</td>
<td>12.7</td>
<td>37</td>
<td>+</td>
<td>+</td>
<td>LMCA</td>
<td>CABG × 2</td>
<td></td>
<td>3.3</td>
<td>Asymptomatic</td>
</tr>
<tr>
<td>7</td>
<td>13</td>
<td>43.8</td>
<td>+</td>
<td>_</td>
<td>SDV</td>
<td>CABG × 1</td>
<td></td>
<td>4.4</td>
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</tr>
<tr>
<td>8</td>
<td>13.8</td>
<td>71</td>
<td>_</td>
<td>+</td>
<td>DVD</td>
<td>CABG × 1 + LAD Unroofing</td>
<td>3.3</td>
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<td></td>
</tr>
<tr>
<td>9</td>
<td>9.4</td>
<td>65</td>
<td>_</td>
<td>_</td>
<td>DVD</td>
<td>CABG × 2</td>
<td>Patent Grafts</td>
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<tr>
<td>10</td>
<td>9.4</td>
<td>22.4</td>
<td>+</td>
<td>+</td>
<td>SDV</td>
<td>CABG × 1 + MV Repair, ARR</td>
<td>3.2</td>
<td>NYHA FC III</td>
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<td>11</td>
<td>2.6</td>
<td>12.2</td>
<td>_</td>
<td>+</td>
<td>DVD</td>
<td>CABG × 2</td>
<td>Patent Grafts</td>
<td>1.4</td>
<td>Asymptomatic</td>
</tr>
<tr>
<td>12</td>
<td>30</td>
<td>38</td>
<td>+</td>
<td>+</td>
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<td>41</td>
<td>+</td>
<td>n/a</td>
<td>LMCA</td>
<td>CABG × 1 + Sub Aortic Membr Resection</td>
<td>0.1</td>
<td>Asymptomatic</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>8.9</td>
<td>259</td>
<td>_</td>
<td>+</td>
<td>DVD</td>
<td>CABG × 2</td>
<td></td>
<td>0.1</td>
<td>Asymptomatic</td>
</tr>
</tbody>
</table>

In 13 patients were asymptomatic and one was in severe cardiac failure. Mean left ventricular ejection fraction was 69% (range 58-72%). There was one late death due to a non-cardiac event. Coronary artery bypass grafting can be performed in the pediatric population with excellent mid-term results. Preoperative stress test can detect silent myocardial ischemia in the pediatric population. Postoperative results show that CABG is an effective method of treating symptomatic children with significant coronary artery disease.

CONCLUSION: Coronary artery bypass grafting can be performed in the pediatric population with excellent mid-term results. Preoperative stress test can detect silent myocardial ischemia in the pediatric population. Postoperative results show that CABG is an effective method of treating symptomatic children with significant coronary artery disease.
**NOTES**

**10:30 am – 11:00 am**  
**COFFEE BREAK, VISIT EXHIBITS, Van Horne Ballroom BC**

**35TH ANNUAL MEETING**

**Van Horne Ballroom A**  
Moderators: Ross M. Ungerleider  
John D. Mitchell  
(10 minutes presentation, 10 minutes discussion)

**13.+ Outcomes in Lung Cancer Patients Initially Refused Operation**  
David A. Edelman, Frank Baciewicz, Jr.  
Wayne State University, Detroit, MI  
DISCUSSANT: PAUL H. SCHIPPER

**BACKGROUND:**  
Recent reports have proposed increased age, increased morbidity, and declining number of lung specialists for the decreased resection rate in early stage lung cancer. Our surgical population includes 21% Second Surgical Opinion (SSO) patients not offered surgical intervention after initial evaluation at other institutions. This study assesses the reasons SSO patients were initially rejected for operation at other institutions and determines the results of operative intervention in the SSO patients in comparison to patients seen initially at a large multidisciplinary cancer center.

**METHODS:**  
An analysis of 124 consecutive patients undergoing lung operation for presumed cancer by a single surgeon from June 2006 through June 2008. This included 26 patients (21%) in the SSO (Group I) and 98 patients (79%) seen initially at our cancer center (Group II). The reason for rejection in Group I patients and the results of operation in both groups were monitored.

**RESULTS:**  
Reasons for initial rejection in Group I patients were:  
1) anatomically unresectable (11 patients);  
2) radiologic contraindication (9 patients);  
3) multiple lesions (6 patients);  
4) inadequate pulmonary reserve (4 patients);  
5) significant medical comorbidities (2 patients);  
6) age older than 86 years (2 patients);  
7) patient misunderstandings (2 patients);  
8) prior high dose radiation (1 patient);  
9) negative diagnostic study (1 patient); and negative exploratory thoracotomy (1 patient).  
Age and comorbidities were similar for both groups.  
Open thoracotomy was performed in 23/26 Group I patients and 76/98 Group II patients.  
The planned resection was completed in 23/26 Group I patients and 94/98 Group II patients.  
Two Group I patients (8%) and nine Group II patients (9%) had positive N2 nodes.  
Length of stay was identical (9 days) and the single death was in a Group II patient.

**CONCLUSIONS:**  
A SSO after initial rejection for extirpation of lung cancer is highly desirable.  
The outcomes in these patients are comparable to patients offered resection after initial evaluation at a large multidisciplinary cancer center.

* Samson Resident Prize Essay
**OBJECTIVE:** Blunt thoracic aortic injury in trauma has traditionally been managed as a surgical emergency. Treatment options have consisted of urgent and delayed open repairs and more recently endovascular stent graft repairs. However with improved imaging capabilities, a broader spectrum of aortic injuries are now detectable, including many injuries consisting of only a partial intimal disruption. In this study, we review our experience with a deliberate, nonoperative management for blunt thoracic aortic injury.

**METHODS:** From January 2001 to May 2008, a retrospective chart review with selective longitudinal follow-up was conducted. All patients admitted to our Level I trauma center that were confirmed to have the diagnosis of blunt aortic injury and survived disposition from the emergency department had their hospital course reviewed. Surveillance imaging with CT angiogram was performed to evaluate the aortic injuries. Nonoperative patients were then reviewed and analyzed for (1) in-hospital survival and interval survival as determined through patient interviews and review of the Social Security Death Index (SSDI), (2) evolution of aortic injury, and (3) possible failure of nonoperative management.

**RESULTS:** During the study period, 54 patients (39 males, 15 females) with an average age of 46 years (range 18–82) were identified with 28% presenting to our emergency department and 72% transferred from outside hospitals. Of the 54 patients, 24 underwent operative management (9 open vs. 15 endovascular stent graft repairs) while 30 patients underwent nonoperative management with anti-impulse therapy. From 2001 to 2004, 20 patients underwent operative repair while 5 underwent nonoperative management. From 2005 to 2008, 4 patients underwent operative repair while 25 underwent nonoperative management. Average Injury Severity Score (ISS) for all patients was 33.9 ± 10.4; with no significant difference between nonoperative vs. operative patients (31.9 ± 10.2 vs. 36.4 ± 10.2; p = 0.91). Of the 30 nonoperative patients, in-hospital survival was 90% (27 patients) with no aortic deaths in the remaining 3 patients. Post-discharge follow-up has shown an interval survival of 96.7% with one non-aortic death (13 patients confirmed alive, while 13 patients not listed in the SSDI). Two patients failed nonoperative management: one for increasing pseudoaneurysm size and underwent open repair, another underwent endovascular stent graft repair for unclear reasons.

**CONCLUSIONS:** This experience suggests that deliberate nonoperative management of select aortic injuries may be a reasonable alternative in the multi-trauma patient; however, serial imaging and long-term follow-up will be necessary to detect treatment failures.
15. Is the “Sterile Cockpit” Concept Applicable to Cardiovascular Surgery? Critical Intervals or Critical Events?

Sarah Henrickson1, Rishi Wadhera2, Douglass Wiegmann2, Thoralf M. Sundt, III1

1Mayo Clinic, Rochester, MN; 2University of Wisconsin, Madison, WI

DISCUSSANT: JAMES I. FANN

BACKGROUND: The concept of maintaining a “sterile cockpit” strictly free of conversation not directly pertinent to the task at hand during periods of high cognitive workload is widely adopted in high consequence industries such as aviation; its transfer to the discipline of surgery has been advocated. An implicit pre-requisite to the feasibility of evidence-based transfer of such a concept to the clinical domain, however, is the clear definition of the period(s) of high cognitive workload for the entire operating room team. We therefore mapped the cognitive workload among team members in the cardiovascular surgical operating room.

METHODS: The NASA Task Load Index (NASA TLX), a validated tool to measure mental workload was administered to a diverse sample of cardiovascular operating room staff (n = 30), including perfusionists, certified registered nurse anesthetists, surgical assistants, surgical technicians, and circulating nurses. Subjects were asked to assess mental workload for 8 different stages of surgery (preparation, induction, opening, initiation of bypass, surgical repair, termination of bypass, closure, and post-op).

RESULTS: The NASA TLX demonstrated widely divergent cognitive workload measures over the course of a typical case (figure). At each stage there were striking differences among caregivers in different roles such that during critical phases for one group (e.g., endotracheal intubation for anesthesia) others were at low work loads, while at other stages other groups were at high levels (e.g., postop for circulating nurses).

CONCLUSIONS: While data such as these are dependent upon subjective assessment, cognitive workload itself is inherently subjective emerging at the intersection of task load and individual subjective assessment of task complexity. The divergence of results among team members reflects the complexity of the tasks at hand and the diversity of team member background and roles. Furthermore, although individual staff (e.g., surgeons) have a sense of their own cognitive workload and when they feel sterile cockpit would be valuable for them, if the “sterile cockpit” is to be of value it must respect the needs of all members of the team. These results suggest that definition of “critical events” rather than a discreet “critical interval” may be more appropriate and confirms that many aviation concepts need significant adaptation before adoption in medicine.
**CF1. The Impact of Bridge to Transplant VAD Support on Long Term Survival Following Cardiac Transplantation: Analysis of a Single Center Experience with over 1000 Heart Transplants**


*University of Utah Health Sciences, Salt Lake City, UT*

**BACKGROUND:** Cardiac transplantation remains the gold standard for the treatment of end-stage heart failure. The major factor limiting the number of heart transplants done in the United States today is the availability of donor hearts. Ventricular assist devices (VAD) allow for the successful bridging of patients who otherwise would not be expected to survive long enough to receive a heart transplant. Several studies have reported equivalent survival at one year in patients who were bridged with a VAD as compared to the broader heart transplant population. Significantly less information is available, however, regarding the long term survival following cardiac transplantation in patients who underwent placement of a VAD as a bridge to transplant. We sought to examine our experience with the use of VADs as a bridge to cardiac transplantation to determine their potential impact on long term survival following cardiac transplantation.

**METHODS:** From 1985 to 2008, 1008 cardiac transplants were performed at a regional transplant center in the Western United States. Among these 1008 cardiac transplants, VADs were placed as a bridge to transplant in 112 patients. Data including gender, age, UNOS status, prior cardiac surgery, etiology of heart failure, prior placement of a
ventricular assist device, panel reactive antibody (PRA) sensitization and Kaplan-Meier survival probabilities were analyzed using multivariable and shared frailty Cox regression models. Hazard Ratios (HR) and Confidence Intervals (CI) were calculated for each variable with a p value < 0.05 determined to be statistically significant.

RESULTS: For the entire cardiac transplant program, Kaplan-Meier survival probability at 1, 5, 10, 15 years was 87%, 79%, 41% and 24% respectively. At one year follow-up, there was no difference in survival between patients who had received VADs as a bridge to transplant and the general cardiac transplant population. At 5 and 10 years following cardiac transplantation, however, survival was significantly decreased in patients who had received a VAD as a bridge to transplant. Specifically, at 5 years survival was decreased to 45% (HR = 2.37, CI 1.58–3.55, p < 0.001) while at 10 years survival was decreased to 16% (HR = 2.20, CI 1.55–3.13, p < 0.001). Patients receiving VADs as a bridge to transplant were significantly more likely to have a PRA > 10% than the general pre-cardiac transplant population. In patients who received a VAD as a bridge to a cardiac transplant, elevation in the pre-transplant PRA correlated with a decrease in long term survival.

CONCLUSIONS: Placement of a VAD as a bridge to a cardiac transplant is associated with a decrease in long term survival following cardiac transplantation. This decrease in survival, however, is not manifest until 5 years following cardiac transplantation. The presence of an elevated PRA prior to transplantation may identify patients who are at greater risk of decreased long term survival following successful bridging to a cardiac transplant with placement of a ventricular assist device.

BACKGROUND: Recent advances in endovascular repair of the descending thoracic aorta (DTA) have put into question the role of open surgery. We evaluated our experience with open DTA replacement using cardiopulmonary bypass (CPB) and hypothermic circulatory arrest (HCA). This technique enables concurrent repair of the distal aortic arch, maintenance of left subclavian artery patency, and provides protection against spinal cord ischemic injury (SCI).

METHODS: From May 1989 to August 2008, 151 patients underwent DTA replacement with left thoracotomy, CPB and HCA. The mean age of the patients was 62 ± 15 years (range 20–85). There were 47 females (31%). Ten patients had Marfan syndrome (7%). The treated diseases included: aneurysm 89 (59%), chronic type B dissection 25 (17%), acute type B dissection 7 (5%), and aortic coarctation 11 (7%). Seventeen patients (11%) underwent emergent operation. The extent of repair was: distal arch and proximal DTA 38 (38%), distal arch and entire DTA 13 (9%), proximal DTA 28 (19%), distal DTA 17 (11%), and entire DTA 35 (23%).

RESULTS: The mean durations of CPB and HCA were 107 ± 34 and 32 ± 9 minutes, respectively. Stroke occurred in five patients (3%), SCI in 2 patients (1%; 1 paraplegia, 1 paraparesis), and renal failure requiring dialysis in 2 patients (1%). Thirty-day and six-month mortality rates were 4% and 10%, respectively. Following emergent operation, the thirty-day mortality rate was 18% compared to 2% after elective surgery (P = 0.02). Ventilatory support was required for a mean of 3 ± 10 days (median, 1 day), and the duration of intensive care unit stay was 6 ± 9 days (median, 4 days). Hospital length of stay was 16 ± 15 days (median, 11 days). During the follow-up period that extended to 18 years, there were 35 late deaths. Five- and ten-year survival rates were 71% and 45%, respectively. Five patients required reoperation on the graft or contiguous aorta at a mean of 5 ± 4 years after the initial repair. Five- and ten-year actuarial rates of freedom from reoperation were 96% and 92%, respectively.
CONCLUSIONS: Cardiopulmonary bypass with HCA can be safely used in the replacement of the DTA and the distal aortic arch. While more invasive than endovascular stent graft placement, this open surgical technique provides definitive repair, maintenance of left subclavian artery patency, a low incidence of reoperation, and acceptable mortality and morbidity rates that do not exceed those reported for endovascular repair.

<table>
<thead>
<tr>
<th>Extent of Repair</th>
<th>Number of Patients</th>
<th>30-day Mortality</th>
<th>Stroke</th>
<th>Spinal Cord Ischemic Injury</th>
<th>Dialysis</th>
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</thead>
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<tr>
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<td>58</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Proximal DTA without Distal Arch</td>
<td>28</td>
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<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Entire DTA with Distal Arch</td>
<td>13</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Entire DTA without Distal Arch</td>
<td>35</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Distal DTA</td>
<td>17</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>151</strong></td>
<td><strong>6 (4%)</strong></td>
<td><strong>5 (3%)</strong></td>
<td><strong>2 (1%)</strong></td>
<td><strong>2 (1%)</strong></td>
</tr>
</tbody>
</table>

Table: Extent of Repair and Associated Morbidity and Mortality

CONCLUSIONS: Cardiopulmonary bypass with HCA can be safely used in the replacement of the DTA and the distal aortic arch. While more invasive than endovascular stent graft placement, this open surgical technique provides definitive repair, maintenance of left subclavian artery patency, a low incidence of reoperation, and acceptable mortality and morbidity rates that do not exceed those reported for endovascular repair.
RESULTS: See Table. In PHYSIO-CTRL and GEO-CTRL MA_s-L shortened significantly during systole, but AML_s-L did not change. In contrast, MA_C-C did not change during systole whereas AML_C-C became significantly smaller. With PHYSIO: (1) MA_s-L and MA_C-C were smaller than PHYSIO-CTRL at ED and ES, and did not change during systole; (2) AML_C-C was smaller than control at ED and ES and decreased during systole; and, (3) AML_s-L was unchanged from control but, unlike PHYSIO, decreased during systole.

CONCLUSIONS: Under baseline conditions during systole, the MA predominantly shortens in the S-L while the AML mainly shortens in the C-C dimension demonstrating that systolic changes in MA and AML dimensions are not directly coupled. Implantation of PHYSIO and GEO reduces both MA_s-L and MA_C-C dimensions, but only reduces the AML_C-C dimension indicating that the AML_C-C dimension is crucial to describe the effects of an AR on mitral leaflet geometry. While AML_s-L was unchanged during systole with PHYSIO, it decreased with GEO suggesting that systolic alterations in AML_s-L dynamics result from the unphysiological shape of the GEO AR. With the increased use of real-time three-dimensional echocardiography, the assessment of leaflet dimensions and their systolic changes may play an important role in pre-operative technical planning of MV repair.

<table>
<thead>
<tr>
<th></th>
<th>PHYSIO-CTRL</th>
<th>PHYSIO</th>
<th>GEO-CTRL</th>
<th>GEO</th>
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<td>MA S-L</td>
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</tr>
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<td>ED</td>
<td>3.01 ± 0.31</td>
<td>2.49 ± 0.14*</td>
<td>2.88 ± 0.20</td>
<td>1.98 ± 0.09*</td>
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<td>ES</td>
<td>2.88 ± 0.20*</td>
<td>2.47 ± 0.15*</td>
<td>2.63 ± 0.22*</td>
<td>1.98 ± 0.08*</td>
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<td>MA C-C</td>
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<tr>
<td>ED</td>
<td>3.94 ± 0.24</td>
<td>3.29 ± 0.08*</td>
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<tr>
<td>ED</td>
<td>1.75 ± 0.25</td>
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<td>1.70 ± 0.17</td>
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<td>1.70 ± 0.26</td>
<td>1.64 ± 0.12</td>
<td>1.59 ± 0.15</td>
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<tr>
<td>ED</td>
<td>3.32 ± 0.28</td>
<td>3.18 ± 0.26*</td>
<td>2.96 ± 0.37</td>
<td>2.90 ± 0.32*</td>
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<tr>
<td>ES</td>
<td>3.03 ± 0.21*</td>
<td>2.98 ± 0.22*</td>
<td>2.82 ± 0.31*</td>
<td>2.81 ± 0.29*</td>
</tr>
</tbody>
</table>

* = p < 0.01 vs. ED, † = p < 0.01 vs. CTRL.

CONCLUSIONS: Simulation-based CPB training appears to be an effective technique to build the confidence of thoracic surgery residents regarding knowledge and applications. Scenario-based practice in a specifically designed simulated environment is valuable adjunct to traditional education methods and has the potential to improve the training of thoracic residents.
The Implementation of a Comprehensive Clinical Protocol Improves Long Term Success Following Surgical Treatment of Atrial Fibrillation
Niv Ad, Linda Henry, Sharon Hunt, Lori Stone
Inova Heart and Vascular Institute, Falls Church, VA

BACKGROUND: Unlike the clear definitions for the surgical procedure to treat atrial fibrillation, no guidelines or definitions regarding perioperative and postoperative treatment exist. More commonly, patients are often being followed by their cardiologists who are unfamiliar with the nuances of the surgical procedure as well as the management of patients’ medical regimen and recurrence of post surgery arrhythmia. We sought to determine the effectiveness of a post discharge protocol designed to coordinate patient management between the cardiac surgeon and cardiologist.

METHODS: Our atrial fibrillation surgery center captures all patients having the maze procedure into a registry designed to provide longitudinal comprehensive clinical follow ups at 3, 6, 9, 12, 18, 24 months. The prospective follow up information collected includes: rhythm status, medications and interventions. Letters with the post discharge protocol as well as letters recommending further interventions required to comply with the protocol were sent to the cardiologists, at the follow up time points.

RESULTS: Currently, we have 334 patients (multiple surgeons) in our registry with over 1600 records and follow up rhythm status information. Independent of the clinical protocol, the return to SR was 86%, 84%, 84% and 84% at 6, 12, 24 and last follow up respectively (mean time to FU = 25.1 months). Significantly improved results were documented for patients who were treated according to the protocol with SR rate of 90% vs 81%, 88% vs 76%, 90% vs 63% and 89% vs 79% at 6, 12, 24 and last follow up respectively (Figure 1). Failure to complete the protocol was documented in 38% of the patients in AF, with the most common deviations being anti-arrhythmic drug treatment, any attempt of cardioversion and placement of patients on rate control regimen prematurely.

CONCLUSIONS: The success rate of the maze procedure is significantly better in patients that were treated according to the clinical protocol. Clinical coordination with the cardiologist is challenging but important; therefore, centers performing the surgical treatment for AF should make the effort to implement a comprehensive clinical algorithm to improve the outcome following the maze procedure.
CF6. Selective Endothelin Receptor Type-A Inhibition in Cardiac Surgery Subjects with Pre-Existing LV Dysfunction: Influence on Early Post-Operative Hemodynamics

John M. Toole1, John S. Ikonomidis*,1, Wilson Y. Szeto2, James L. Zellner1, John Mulcahy1, Rachael L. Deardorff1, Theresa A. Brinsa1, Francis G. Spinale1
1Medical University of South Carolina, Charleston, SC; 2University of Pennsylvania, Philadelphia, PA; *University of Tennessee at Chattanooga, Chattanooga, TN

BACKGROUND AND OBJECTIVE: A robust release of endothelin (ET) with subsequent ET-A subtype receptor (ET-AR) activation occurs in patients following cardiac surgery requiring cardiopulmonary bypass (CPB). Increased ET-AR activation has been identified in patients with poor LV function (reduced ejection fraction; EF). Accordingly, this study tested the hypothesis that a selective ET-AR antagonist (ET-ARA) administered peri-operatively would favorably affect post-CPB hemodynamic profiles in patients with a pre-existing poor LVEF.

METHODS AND RESULTS: Patients (n = 29; 66 ± 2 yrs) with a reduced LVEF (37 ± 2%) were prospectively randomized, in a blinded fashion, at the time of elective coronary revascularization and/or valve replacement requiring CPB, to infusion of the ET-ARA, sitaxsentan at 1 or 2 mg/kg (IV bolus; n = 9, 10 respectively) or vehicle (placebo; n = 10). Infusion of the ET-ARA/vehicle was performed immediately prior to separation from CPB and again at 12 hrs post-CPB. ET and hemodynamic measurements were performed at baseline, at separation from CPB (Time 0) and at 0.5, 6, 12, 24 hrs post-CPB. Baseline plasma ET (4.0 ± 0.3 fmol/mL) was identical across all 3 groups, but when compared to pre-operative, baseline values obtained from age matched subjects with a normal LVEF (n = 37, LVEF > 50%), were significantly increased (2.9 ± 0.2 fmol/mL, p < 0.05). Baseline systemic (SVR, 1358 ± 83 d.s.cm–5) and pulmonary (PVR, 180 ± 23 d.s.cm–5) vascular resistance were equivalent in all 3 groups. As a function of Time 0, SVR changed in an equivalent fashion in the post-CPB period, but a significant ET-ARA effect was observed for PVR (ANOVA; p < 0.05). Moreover, the greatest reduction in PVR was observed in the 2 mg/kg ET-ARA group at the later post-operative time points (Figure 1). Total adverse events were equivalently distributed across the ET-ARA/placebo groups.

CONCLUSIONS: This is the first study to utilize an ET-ARA in patients with compromised LV function and elevated pre-operative ET levels in the context of cardiac surgery. The results from this study demonstrated that infusion of an ET-ARA was not associated with hemodynamic compromise. Moreover, ET-ARA favorably affected PVR in the early post-operative period. Thus, the ET-ARA serves as a potential pharmacological target for improving outcomes following cardiac surgery in patients with compromised LV function.
**CF7. Ventricular Restraint Decreases RV Diastolic Compliance and Prevents RV Dilatation in Heart Failure**

Lawrence S. Lee, Ravi K. Ghanta, Vakhtang Tchantchaleishvili, Daihei Wang, Suyog Mokashi, Rita G. Laurence, O. Coelho-Filho, Raymond Kwong, Ralph M. Bolman, Lawrence H. Cohn*, Frederick Y. Chen

**Brigham and Women’s Hospital, Boston, MA**

**BACKGROUND:** Our previous studies have shown that ventricular restraint decreases left ventricular (LV) transmural pressure (Ptm) and indices of myocardial oxygen consumption (MvO2) to promote LV reverse remodeling in heart failure (HF). No study has yet evaluated the acute and chronic effects of restraint on the right ventricle (RV). We hypothesized that ventricular restraint decreases RV Ptm and effective diastolic compliance and prevents RV remodeling in HF.

**METHODS:** A fluid-filled epicardial balloon was implanted around the ventricles of 10 adult sheep. Restraint levels were defined by the maximum pressure applied by the balloon to the epicardium. This occurred at end-diastole. In each animal, aortic, LV, RV, and epicardial pressures, and RV volume were measured at 5 increasing restraint levels (0, 1.5, 3.0, 5.0, and 8.0 mmHg) in an acute study. Ptm was defined as ventricular pressure minus epicardial pressure. At each restraint level, a caval occlusion was performed to determine the effective RV systolic (Cs) and diastolic (Cd) compliance. Effective RV Cs and Cd is a combination of restraint wrap and RV compliance. Indices of myocardial oxygen consumption, tension-time index (TTI) and pressure volume area (PVA) were then calculated for each restraint level. The chronic effects of restraint on the RV remodeling were then evaluated by implanting a passive ventricular restraint wrap around the ventricles in a chronic HF sheep model. HF developed in 3 animals 2 months after ligation of diagonal coronary arteries. RV end-diastolic volume (EDV) and ejection fraction (EF) were assessed with cardiac MRI over a 4 month interval. Changes in RV mechanics and size were assessed using a mixed-model.

**RESULTS:** Unlike the LV, ventricular restraint had no significant effect on RV Ptm (p = 0.92) or indices of RV MvO2 (p = 0.90). As restraint level was increased, diastolic RV pressure increased correspondingly. Restraint had no effect on RV systolic contractility (p = 0.43). Restraint decreased RV diastolic compliance and shifted the diastolic pressure-volume relationship to the left (p < 0.05). In chronic studies, progressive RV dilatation was prevented with restraint therapy. RV EDV was 64 ± 6 ml at the start of therapy and 67 ± 7 ml after 4 months of therapy (p = 0.2). RV EF was 60 ± 4% at baseline and 61 ± 8% after 4 months of therapy (p = 0.7).

**CONCLUSIONS:** Ventricular restraint affects the RV differently than the LV. Restraint decreases effective diastolic compliance of the RV but unlike the LV, does not decrease RV Ptm and indices of MvO2. The decrease in effective diastolic compliance may prevent further RV dilatation in HF because RV Ptm and indices of MvO2 are not reduced with restraint, unlike the LV, higher levels of restraint may not induce reverse RV remodeling.

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**Table 1:**

<table>
<thead>
<tr>
<th>Restraint Level (mmHg)</th>
<th>Mean Ptm LV (mmHg)</th>
<th>Mean Ptm RV (mmHg)</th>
<th>Mean TTI (mmHg*sec)</th>
<th>Mean PVA (mmHg * mL)</th>
<th>Cs (mL/mmHg)</th>
<th>Cd (mL/mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32.3</td>
<td>12.4</td>
<td>6.5</td>
<td>901</td>
<td>0.6</td>
<td>12.1</td>
</tr>
<tr>
<td>1.5</td>
<td>32.0</td>
<td>10.2</td>
<td>5.0</td>
<td>1000</td>
<td>0.8</td>
<td>11.8</td>
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<td>3.0</td>
<td>27.5*</td>
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<td>6.7</td>
<td>1486</td>
<td>0.9</td>
<td>7.9*</td>
</tr>
<tr>
<td>5.0</td>
<td>23.8*</td>
<td>13.2</td>
<td>6.9</td>
<td>1331</td>
<td>0.7</td>
<td>5.4*</td>
</tr>
<tr>
<td>8.0</td>
<td>16.8*</td>
<td>13.6</td>
<td>7.2</td>
<td>1164</td>
<td>0.9</td>
<td>3.1*</td>
</tr>
</tbody>
</table>

*p < 0.05 change from baseline

* WTSA Member
Mid Term Results of Transapical Aortic Valve Replacement via real-time MRI Guidance
Keith A. Horvath, Dumitru Mazilu, Michael Guttman, Ming Li
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BACKGROUND: Percutaneous valve replacements are presently being evaluated in clinical trials. As delivery of the valve is catheter based, the safety and efficacy of these procedures may be influenced by the imaging employed. To assist the operator and improve the success of the operation, we have performed transapical aortic valve replacements (AVR) using real-time MRI guidance (rtMRI).

METHODS: Twenty eight domestic pigs (50–65 kgs.) were anesthetized and underwent rtMRI AVR on the beating heart without unloading by rapid ventricular pacing or cardiopulmonary bypass. This was accomplished using commercially available stentless bioprostheses (21–25 mm) mounted on platinum iridium stents. MR imaging (1.5T) was used to precisely identify the anatomic landmarks of the aortic annulus, coronary artery ostia, and the mitral valve leaflets. In addition to anatomic confirmation of adequate placement of the prosthetic valve in relation to the aortic annulus and the coronary arteries, functional assessment of the valve and left ventricle was also obtained with MR imaging. Intraoperative perfusion scanning documented adequacy of myocardial blood flow after valve placement. Phase velocity scans confirmed adequate opening of the prosthetic valve leaflets and lack of valvular or paravalvular regurgitation. Avoidance of injury to the mitral valve or subvalvular apparatus was also confirmed and readily assessed. A series of acute feasibility experiments were conducted (n = 18) in which the animals were sacrificed after valve placement and MRI assessment. Ten additional animals were allowed to survive and had follow-up MRI scans and confirmatory echocardiography (2D and 3D) at 1, 3 and 6 months postoperatively. Post-mortem gross and histopathology was also performed.

RESULTS: rtMRI provided superior visualization of the landmarks needed to implant the aortic valve prostheses compared to fluoroscopy or echocardiography. The time to implantation after the apical access was obtained to deployment of the valve was 74 ± 18 seconds. The average procedure duration was less than forty minutes. Perfusion scanning demonstrated adequate coronary flow and functional imaging documented preservation of ventricular contractility in all animals following successful deployment. Phase contrast imaging revealed minimal intra or para-valvular leaks. Longer term results demonstrated stability of the implants with preservation of myocardial perfusion and function over time. Necropsy confirmed the MRI and echo results.

CONCLUSIONS: rtMRI provides excellent visualization for intraoperative guidance of aortic valve replacement on the beating heart. Additionally it allows assessment of tissue perfusion and organ function that are not obtainable by conventional imaging alone. Expansion of rtMRI guidance to facilitate other types of cardiac surgical procedures should be considered to minimize trauma and enhance patient benefit.
CF9. Effect of Regional Anesthesia on Recurrence in Completely Resected, Stage IA Non-Small Cell Lung Cancer Patients


University of Pittsburgh Medical Center, Pittsburgh, PA

BACKGROUND: Through its potential effect on the immune response to pain, regional anesthesia (RA) has been associated with decreased cancer recurrence in certain organ sites (e.g.: breast, melanoma). The study objective was to examine the relationship between RA and recurrence in lung cancer patients.

METHODS: Retrospective review of completely resected, stage IA, non-small cell lung cancer (NSCLC) patients. Patients were divided in 2 groups: RA and patient-controlled intravenous analgesia alone (PCA). The relationship between RA and oncologic outcomes was evaluated using a multivariate analysis.

![](image)
RESULTS: From 2001–2006, 165 patients (male = 53.3%; female = 46.7%; age = 67.6 ± 0.7 years) had complete resection for stage IA NSCLC, and none received chemotherapy or radiation. Regional anesthesia (RA) was utilized in 91 (55.2%) and patient-controlled intravenous analgesia (PCA) in 74 (44.8%). Sublobar resection was performed in 48 (29.1%). The groups were statistically similar in gender, histology, type of resection (sublobar versus lobar), mean tumor size, proportion of tumors >2 cm, and overall survival. Recurrences were locoregional in 11 (6.7%) and distant in 24 (14.5%). The overall mean recurrence-free interval was 37.7 ± 1.5 months. Although the distant recurrence rate was similar, the probability of locoregional recurrence was significantly lower in patients who received RA (0.6% vs 6.1%; p = 0.006). The mean recurrence-free interval was significantly longer (8.2 months) in the RA group (76.6 ± 0.8 vs 68.4 ± 2.6 months; p = 0.011). After multivariate analysis, RA remained a significant predictor of improved locoregional recurrence rate (p = 0.014).

CONCLUSIONS: In lung cancer patients who undergo surgical resection, the potential impact of perioperative pain control strategies on cancer recurrence merits further investigation.

BACKGROUND: Lung transplantation is an effective treatment for select patients with end-stage pulmonary disease, yet availability of donor organs remains a barrier to transplantation. While overt infection is considered a contraindication, the implications of an isolated positive gram stain remain unclear. LPS, the best known ligand for TLR-4, has been shown to induce acute lung injury in high doses, while paradoxically, low doses may modulate subsequent lung ischemia reperfusion injury (LIRI). TLR-4 classically initiates signaling through recruitment of the adaptor protein MyD88, but can also initiate a MyD88 independent signaling pathway, reducing proinflammatory signaling and leading to type I interferon responses and IL-10 production, which are protective in LIRI. We hypothesize that LPS preconditioning alters the TLR-4 signaling response to oxidative stress by signaling through a MyD88-independent pathway, thereby conferring ischemic tolerance.

METHODS: Rats were pretreated with intravenous Myd88 or TLR-4 siRNA in a lipid vector 48 hours prior to low dose intratracheal LPS installation and prior to left lung ischemia and reperfusion (IR). Following reperfusion, lungs were assessed for vascular permeability, cytokine content, MAPK activation and target protein knockdown.

RESULTS: LPS pretreatment followed by the IR protocol led to a 74% reduction in vascular permeability (p < 0.05), a greater than 90% reduction in CINC and TNF-α secretion (p < 0.001), and an 80% reduction in both JNK and p38 phosphorylation (p < 0.05), compared to positive controls. LPS pretreatment without IR yielded results equivalent to negative controls. Myd88 knockdown did not eliminate the protective effect of LPS pretreatment, whereas TLR-4 knockdown did eliminate the protective effect. Western blotting confirmed effective knockdown of Myd88 and TLR-4.

CONCLUSIONS: Low dose LPS pretreatment significantly reduced endothelial dysfunction and inflammatory mediator production following subsequent exposure to IR. This work is the first to describe a functionally relevant, protective effect of LPS preconditioning on LIRI through a TLR-4 mediated Myd88-independent pathway. Understanding the protective effect of LPS preconditioning has the potential to expand and clarify donor inclusion criteria, therefore improving the clinical outcome of patients with end-stage pulmonary disease.

* WTSA Member
CF11. Combined Proteasome and Histone Deacetylase Inhibition Upregulates E-Cadherin Metastasis Suppressor Gene Expression and Attenuates Epithelial-Mesenchymal Transition in Esophageal Cancer
Matthew D. Taylor, Yuan Liu, Alykhan S. Nagji, Nicholas Theodosakis, David R. Jones
University of Virginia, Charlottesville, VA

BACKGROUND: Metastasis is governed in large part by perturbations in the epithelial-mesenchymal transition (EMT) and alterations in metastasis suppressor gene profiles. The combined use of proteasome and histone deacetylase (HDAC) inhibitors has shown significant promise in the treatment of selected solid tumors, including lung cancer. No studies have investigated this molecularly-targeted drug combination in the treatment of esophageal cancer. The purpose of this study is to investigate the effect of Vorinostat, an HDAC inhibitor, and Bortezomib, a proteasome inhibitor, on esophageal cancer metastasis.

METHODS: Three-dimensional tumor spheroids that mimic tumor architecture were created using esophageal squamous (TE2) and adenocarcinoma (SKGT4) cancer cells. Cells were treated with TNF-α to simulate the pro-inflammatory tumor milieu and TGF-β, a cytokine critical for the induction of the EMT. 3-D tumors were then treated with Vorinostat and/or Bortezomib. Cell proliferation assays were used to assess cell death. Boyden chamber invasion assays were performed to quantify cell invasion following treatment. mRNA expression of the metastasis suppressor genes BRMS-1, E-cadherin, CD44, and KISS-1 was performed using quantitative RT-PCR (QRT-PCR). Statistical analysis was performed using Student’s t-test with p < 0.05 considered significant.

RESULTS: Combined Vorinostat and Bortezomib resulted in maximal, yet modest, cancer cell death at 24 hours (40% cell death in squamous cell; 45% cell death in adenocarcinoma). TNF/TGF treatment was associated with a 1.7 fold increase in adenocarcinoma invasion (p = 0.01) and a 1.5 fold increase in squamous cell cancer invasion (p = 0.02) compared to controls. Combined therapy resulted in a 3.7 fold decrease in adenocarcinoma cell invasion (p = 0.002) and a 2.8 fold decrease in squamous cell invasion (p = 0.003) using 2-D invasion assays. Three dimensional invasion assays shown in Figure 1 demonstrate a significant decrease in metastatic movement following combined therapy of Vorinostat and Bortezomib. QRT-PCR revealed a robust rescue of E-cadherin transcripts following combined therapy in both histologies with no difference in BRMS-1, CD44, and KISS-1 mRNA levels (Table 1).

CONCLUSIONS: Combined Vorinostat and Bortezomib therapy significantly decreases esophageal cancer EMT and metastatic movement, suggesting a robust tumoristatic function. This combined therapy effect on esophageal cancer metastasis was associated with upregulation of the metastasis suppressor gene, e-cadherin.

Table 1: Quantitative RT-PCR of E-Cadherin Gene Expression (expressed as fold increase in gene expression compared to GAPDH)

<table>
<thead>
<tr>
<th>Tumor Type</th>
<th>No Treatment</th>
<th>TNF/TGF</th>
<th>TNF/TGF/S4HC</th>
<th>TNF/TGF/Bort.</th>
<th>TNF/TGF/S4HC/Bort.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Squamous</td>
<td>15921617</td>
<td>429165</td>
<td>31398302</td>
<td>728635</td>
<td>425332500</td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>6749</td>
<td>534</td>
<td>326</td>
<td>1042</td>
<td>881</td>
</tr>
</tbody>
</table>

Mean±SEM, p-values are compared to TNF/TGF
BACKGROUND: Exposure of esophageal epithelium to gastric and duodenal contents results in inflammation demonstrated by hyperproliferation and mucosal thickening. Inflammation caused by reflux plays a role in a wide range of esophageal disorders including esophagitis and malignancy. To date there has been little investigation into the molecular mechanisms which underlie esophageal inflammation. Recently in vitro studies have demonstrated upregulation of heat shock protein-27 (Hsp27) in isolated esophageal cells when exposed to acidic stress. Expression of Hsp27 has been shown to promote cell survival and proliferation in several tissue types in response to inflammation. We sought to determine the influence of gastroduodenal reflux (GDR) in vivo on Hsp27 expression in a murine model of gastroduodenal reflux.

METHODS: BALB/c mice (n = 8) underwent side-to-side surgical anastomosis of the first portion of the duodenum and GE junction that resulted in continuous exposure of esophageal mucosa to mixed gastric and duodenal contents. Control mice (n = 8) consisted of BALB/c mice which were surgically unaltered. Mice were euthanized at 12 weeks using CO₂ inhalation and esophageal tissue was either frozen in embedding medium or homogenized in cell lysis buffer. Immunoblotting using standard techniques was used to detect levels of Hsp27. Immunofluorescent staining was used to characterize Hsp27 location with positive staining shown in red. ANOVA statistical analysis was used to compare mean band density between groups.

RESULTS: All mice survived the reflux procedure and there was no significant difference in weight gain throughout the study period. Levels of Hsp27 were increased by approximately 75% (p < 0.01) in tissue exposed to 12 weeks of mixed reflux compared to that of controls (Fig 1). Expression of Hsp27 mainly localized to the esophageal epithelium (Fig 2).

CONCLUSIONS: We show for the first time that expression of Hsp27 is induced in response to gastroduodenal reflux in vivo. Furthermore, its expression is primarily localized to the epithelial layer which is significantly affected by GDR. This finding suggests that Hsp27 plays an integral role in the esophageal mucosal response to inflammation caused by GDR.
CF13. Prospective, Randomized Comparison Between T2 and T3 Thoracoscopic Sympathicotomy for Disabling Palmar Hyperhidrosis
Fritz J. Baumgartner1,2, Maria Reyes1, Alicia Iglesias1, Elizabeth Reyes1, Grant Sarkisyan1
Surgery Associates, Los Alamitos, CA; 2Doctors Outpatient Surgery Center, Fountain Valley, CA

BACKGROUND: Thoracoscopic sympathetic surgery is highly effective in treating disabling palmar hyperhidrosis. Controversy exists as to the ideal level to maximize efficacy and minimize side effects, most notably compensatory hyperhidrosis (CH). The objective of this study was to compare T2 and T3 sympathicotomy relative to efficacy and side effects in patients with massive palmar hyperhidrosis.

METHODS: Prospective randomized study of 124 consecutive patients with disabling palmo-plantar hyperhidrosis assigned to bilateral sympathicotomy (sympathetic transaction) either over the 2nd costal head in 63 patients (n = 126 extremities) or 3rd costal head in 61 patients (n = 122 extremities). Patients were questioned by phone or mail at 6 and 12 months to assess efficacy, side effects, and patient satisfaction relative to the procedure.

RESULTS: Sympathicotomy at T2 was effective in 126/126 (100%) of instances in curing the extremity of palmar hyperhidrosis. Sympathicotomy at T3 failed to cure palmar hyperhidrosis in 3 patients (612 extremities) or 3rd costal head in 61 patients (n = 122 extremities). Patients were questioned by phone or mail at 6 and 12 months to assess efficacy, side effects, and patient satisfaction relative to the procedure. Two of the T3 failure patients underwent bilateral redo T2 sympathicotomy procedures with curative results bilaterally. There were no differences in extent or location of CH or patient satisfaction between T2 or T3 groups, nor was there a difference in perceived benefit for plantar hyperhidrosis. Univariate and multivariate analyses at 6 and 12 months showed that presence or severity of CH and patient satisfaction were independent of sympathicotomy level, age, gender, or race. Five (4%) of the 124 patients ranked the CH as extremely bothersome, 3 were T2 and 2 were T3 sympathicotomies. Of these, only 1, a T3 sympathicotomy, staled the CH was life-interfering. No patient regretted the procedure and there were no other side effects or complications.

CONCLUSION: Sympathicotomy at the T2 level appears to be more reliable than at the T3 level to cure severe palmar hyperhidrosis and does not worsen the extent of CH or patient satisfaction.

Keith D. Coon, Landon J. Inge, Kristen Swetel, Jamie DeChon, Michael A. Smith, Ross M. Bremner*
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BACKGROUND: There are potential deleterious sequelae of the physiologic response to surgically induced stress. Some of the upregulated inflammatory cytokines have been shown to act as tumor growth factors and/or angiogenic and metastatic promoters. Modulation of these negative effects has the potential to improve outcomes from surgery, and possibly improve long-term survival after tumor resection. The profound effect of surgery on gene expression has yet to be fully elucidated. We assayed gene expression changes in an animal model of thoracotomy versus sham operation and then evaluated the ability of a cyclo-oxygenase inhibitor, celecoxib, to mediate these changes.

METHODS: 48 adult male BALC/c mice were randomized into three experimental groups: Group 1 (n = 16, sham operation with anesthesia only), Group 2 (n = 16, thoracotomy incision without opening the pleura), and Group 3 (n = 16, thoracotomy incision with perioperative COX-2 inhibition using celecoxib). Anesthesia protocols were consistent for all groups using ketamine and xylazine. Six hours after surgery, animals were sacrificed and blood was collected via cardiac puncture and processed for isolation of total RNA using the Mouse RiboPure™ Blood RNA Isolation Kit (Ambion, Austin, TX). Pooled RNA samples from each group were labeled and hybridized (in quadruplicate) to 4 × 44K Whole Mouse Genome Oligo Microarrays (Agilent, Foster City, CA). Gene expression profiles were analyzed to determine the genetic/biochemical effects of both surgery and celecoxib treatment.

RESULTS: Surgery initiates a discernable cascade of gene expression changes that can be characterized and quantified by analysis via microarray. Significant gene expression changes were obtained at the p < 0.05 level by statistical analysis of quadruplicate arrays via ANOVA followed by the Benjamini and Hochberg multiple testing correction. Gene expression changes occurred in genes characterizing a variety of biochemical pathways including those that mediate the inflammatory response and angiogenesis (figure). Many of these gene expression changes induced by surgery were mitigated by perioperative treatment with celecoxib.
CONCLUSIONS: Surgery has a profound effect on the upregulation of many genes, many of which are related to the inflammatory response. Perioperative treatment with a COX-2 inhibitor abated many of these changes. The gene expression profile approach enables the further evaluation of genes and pathways that are deleterious to patient both in terms of perioperative recovery and tumor progression.

BACKGROUND: To 1) compare survival after lung transplantation (LTx) in patients requiring pre-transplant mechanical ventilation (MV) or extracorporeal membrane oxygenation (ECMO) with those not requiring mechanical support, and 2) identify risk factors for mortality.

METHODS: Data were obtained from the United Network for Organ Sharing for LTx from 10/1987 to 1/2008. 15,934 primary transplants were performed, 586 in patients on MV and 51 on ECMO. Differences between nonsupport and those supported by MV or ECMO were expressed as two propensity scores for use in comparing risk-adjusted survival.

RESULTS: Unadjusted survival at 1, 6, 12, and 24 months was 83%, 67%, 62%, and 57% for MV; 72%, 53%, 50%, and 45% for ECMO; and 93%, 85%, 79%, and 70% for unsupported patients (P < .0001), respectively. MV recipients were younger, had lower FVC%, and diagnoses other than emphysema. ECMO recipients were also younger, had higher body mass index, and diagnoses other than cystic fibrosis/bronchiectasis. Once these variables, transplant year, and propensity for mechanical support were accounted for, survival remained worse after LTx for MV and ECMO patients.
CONCLUSIONS: Although survival after LTx is worse when preoperative mechanical support is necessary, it is not dismal. Thus, additional risk factors for mortality should be considered when selecting patients for LTx to maximize survival. Reduced survival for this high-risk population raises the important ethical issue of balancing maximal individual patient survival against benefit to the maximum number of patients.

BACKGROUND: Mucosal ablation of high-grade dysplasia using RFA is increasingly reported. RFA for non-dysplastic Barrett’s in combination with an antireflux procedure (ARP) has not been widely documented. We report our initial experience with RFA in association with ARP for Barrett’s metaplasia (BM) and low-grade dysplasia (LGD).

METHODS: A total of 16 patients (11 male/5 female) presented with BM (n = 13) or LGD (n = 3). Median age was 58 (38–80) years. Barrett’s severity was classified by length (cm), appearance (circumferential/non-circumferential) and grade (0 = normal, 1 = BM, 2 = LGD). RFA was performed using the HALO 360° or 90° systems.

RESULTS: Median follow-up was 13 months. 13 patients had ARP (4 prior to any ablation). The mean number of ablative procedures undertaken was 2.6 (2–6). There was no mortality. One patient required dilation after treatment. Mean length of Barrett’s decreased from 6.2 to 1.6 cm after treatment (p = 0.001). Barrett’s grade decreased significantly (p = 0.006) (see figure 1). Prior to therapy, circumferential Barrett’s was present in 14 (87.5%) and non-circumferential Barrett’s in 2 (12.5%). At last endoscopy only one patient had circumferential Barrett’s.

CONCLUSIONS: RFA is feasible and effective for reducing metaplasia and dysplasia and can be used in association with ARP. Long-term studies will be necessary to determine whether this approach can provide durable control of both reflux and BM.
CF17. Re-Coarctation Following Stage 1 Reconstruction Does Not Adversely Affect Survival or Outcome at Fontan Completion

Jean A. Ballweg1, Troy E. Dominguez1, Chitra Ravishankar1, Peter J. Gruber1, Gil Wernovsky1, Jonathan J. Rome1, Matthew J. Gillespie1, J. William Gaynor1, Susan C. Nicolson1, Thomas L. Spray1, Sarah Tabbutt2

1Children’s Hospital of Philadelphia, Philadelphia, PA; 2University of California San Francisco, San Francisco, CA

BACKGROUND: To determine the effect of re-coarctation following stage 1 reconstruction (S1R) for hypoplastic left heart syndrome (HLHS) and variants on survival, suitability for Fontan and morbidity at Fontan.

METHODS: Retrospective review of echocardiograms, catheterizations and hospital records of patients who underwent S1R from January 2002 to May 2005 and cross-sectional analysis of hospital survivors. Kaplan Meier curves were derived for all patients who were alive ≥30 days after S1R (n = 146).

RESULTS: 176 patients underwent S1R. 43 patients (23%) developed re-coarctation and underwent balloon angioplasty (BA) (n = 43) and/or surgical intervention (n = 4). Median time to intervention was 123 (1−316) days. 7/43 (16%) patients underwent >1 BA. 39/43 (91%) patients underwent intervention prior to second stage reconstruction (S2R) and 4 patients underwent BA between S2R and Fontan. Freedom from death or transplant was no different between those patients who developed re-coarctation requiring intervention compared to those without re-coarctation (p = 0.24). 100 patients have undergone Fontan. Need for reintervention did not decrease suitability for Fontan completion. Echocardiographic data was available for 98 patients prior to Fontan. There was no difference in prevalence of qualitative moderate or severe ventricular systolic function between those with re-coarctation and those without (22/33 (6%) vs. 49/53 (6%), p = 0.86). Qualitatively significant atrioventricular valve regurgitation was more common in patients with re-coarctation than in those without (28/33 (89%) vs. 40/65 (62%), p = 0.02). Median filling pressures at pre-Fontan catheterization were significantly higher in patients who had re-coarctation 8 (5−12) mmHg vs. those without 6 (3−15) mmHg, p = 0.035. Overall mortality following Fontan was 2% and was not different between groups. Length of stay at time of the Fontan was not different between those patients with re-coarctation 8.3 (2−73) days vs. those without 8 (3−37) days, p = 0.86.
CONCLUSIONS: Re-coarctation following S1R is common. Although patients who underwent reintervention had higher filling pressures and a higher likelihood of significant atrioventricular valve regurgitation, this did not affect their suitability for the Fontan procedure, mortality or hospital length of stay. Continued follow up is necessary to determine the impact of re-coarctation on longer term mortality, morbidity and quality of life.

CF18. Atrioventricular Valve Repair in Patients with Functional Single Ventricle
Tomohiro Nakata, Yoshifumi Fujimoto, Keiichi Hirose, Masaki Osaki, Yuko Tosaka, Yujiro Ide, Maiko Tachi, Kisaburo Sakamoto
Shizuoka Children’s Hospital, Shizuoka, Japan

BACKGROUND: There is a paucity of knowledge about systemic atrioventricular valve (AVV) regurgitation in patients with functional single ventricle (fSV), because most studies have focused on the surgical technique, diagnosis, valve anatomy or the surgical stage leading to Fontan completion. The purpose of this study is to evaluate the surgical repair for AVV regurgitation in all patients with fSV.

METHODS: We performed a retrospective chart review of all consecutive fSV patients who had undergone AVV repair at a tertiary pediatric cardiac center between January 1999 and October 2008. Kaplan-Meier and Cox proportional hazard model were used for statistical analyses.

RESULTS: We identified 64 fSV patients, including 12 newborns. Median age was 9.5 months (range, 0 day–17 years) and median weight was 9.0 kg (range, 2.5–66.0 kg). The primary diagnosis was heterotaxy in 30 patients, and hypoplastic left heart syndrome (HLHS) in 12. The systemic AVV morphology was common atrioventricular valve in 34 patients, tricuspid valve in 20, mitral valve in 2, and both tricuspid and mitral valves in 8. AVV regurgitation was repaired at palliative stage in 21 patients, at Glenn stage in 29, and at Fontan stage in 14. There was no initial valve replacement during the study period. The major procedures of AVV repair included commissural annuloplasty in 50 patients, closure of commissure or cleft in 32, edge-to-edge repair in 19, De Vega in 8, and chorda shortening or reconstruction in 7. The major concomitant procedures included pulmonary artery angio-plasty in 24 patients, bidirectional Glenn in 22, Fontan procedure in 10, repair of total anomalous pulmonary venous return or pulmonary venous obstruction in 10, systemic-to-pulmonary shunt in 8, and Norwood procedure in 5. The mean follow-up period was 36.5 ± 36.7 months, and follow-up was complete in all patients. The overall survival rates after the AVV repair were 76.4% and 70.0% at 1 and 5 years, respectively. Younger age (p = 0.009), lower body weight (p = 0.004), HLHS (p = 0.002), concomitant Norwood procedure (p < 0.001), and palliative stage (p = 0.006) were the risk factors for mortality. Among 64 patients, 20 underwent reoperation for AVV (repairs, 15; replacements, 3), and freedom from reoperation for AVV were 68.2% and 56.0% at 1 and 5 years, respectively. Concomitant systemic-to-pulmonary shunt (p = 0.044) was a risk factor for reoperation. Of the 47 survivors, 37 underwent Fontan completion; 7, Glenn; and 3 is awaiting Glenn. Follow-up cardiac catheterization was performed in 32 patients after Fontan completion, which showed central venous pressure, 12.7 ± 2.3 mmHg; cardiac index, 3.1 ± 0.7 L/min/m²; ejection fraction, 55.4% ± 11.5%; and arterial oxygen saturation, 92.9% ± 5.0%.
CONCLUSIONS: The midterm results of the surgical repair for AVV regurgitation in ISV patients were favorable. With AVV repair in appropriate timing, cardiac function was maintained effectively. The outcomes of surgical AVV repair in ISV patients at palliative stage, especially in HLHS patients, is not promising, but can be improved.

The midterm results of the surgical repair for AVV regurgitation in ISV patients were favorable. With AVV repair in appropriate timing, cardiac function was maintained effectively. The outcomes of surgical AVV repair in ISV patients at palliative stage, especially in HLHS patients, is not promising, but can be improved.

BACKGROUND: Surgical repair of total anomalous pulmonary venous connection (TAPVC) continues to be associated with significant mortality and morbidity rates, especially in single ventricle patients. This study will analyze the results of surgical repair of TAPVC at one institution to look for trends and indicators of positive outcome.

METHODS: Our cardiac surgery database was used to identify all patients who underwent surgical repair of TAPVC from 1990–2008 (n = 100). Specific TAPVC types were supra-cardiac (52), cardiac (15), infracardiac (23) and mixed (10). Median age at repair was 14.6 days (range, 0–4 years) and median weight was 4.0 kg (range, 1.3–15 kg). Patients were divided into two groups based on biventricular (BV, n = 83) or univentricular (SV, n = 17) anatomy for analysis.

RESULTS: There were 12 operative deaths (4 BV [5%] vs. 8 SV [47%], p < 0.01) and 9 late deaths (6 BV [7%] vs. 3 SV [18%], p < 0.05). Death by TAPVC type was supra-cardiac 12/52 (23.1%), cardiac 1/15 (6.7%), infracardiac 3/23 (13.0%), and mixed 5/10 (50%). Pulmonary venous obstruction was present in 32 patients which included 24 BV (29%) vs 8 SV (47%), p = 0.16. The pulmonary veins were obstructed in 8/21 patients (38%) that died versus 13/21 (62%) in unobstructed patients (p = 0.06). Mean cardiopulmonary bypass time was 95.1 ± 40.5 minutes (86.2 ± 31.0 BV vs. 139.4 ± 53.3 SV, p < 0.01) and mean aortic cross-clamp time was 42.9 ± 23.1 minutes (43.9 ± 22.4 BV vs. 37.3 ± 26.7 SV, p = NS). Deep hypothermic circulatory arrest (DHCA) was used in 38 patients (27 BV, 32%; 11 SV, 64.7%). Mean DHCA time was 31.4 ± 10.7 minutes with no difference between groups. Median postoperative length of stay was 11 days (range, 0–281 days). Nineteen surviving patients required reoperation for pulmonary venous stenosis (14 BV vs. 5 SV); median time to reoperation was 104 days (range, 4–753 days).

CONCLUSIONS: TAPVC continues to be a surgical challenge. Outcomes are good for patients with BV anatomy. Patients with SV anatomy have very high mortality and are at increased risk for pulmonary vein stenosis leading to reoperation. Mortality is highest in mixed-type TAPVC. Pulmonary venous obstruction was not associated with increased mortality.
CF20. Extracardiac Fontan: Comparison of Fenestrated with non Fenestrated Patients
Andrew C. Fiore1, Mark Ruzmetov1, Corinne Tan1, Mark D. Rodefeld2, Mark W. Turrentine2, John W. Brown1
1St. Louis University School of Medicine, St. Louis, MO; 2Indiana University School of Medicine, Indianapolis, IN

BACKGROUND: Fenestration for the extracardiac Fontan (ECF) remains controversial. Fenestration may be related to less pleural drainage and shorter hospital stay, but at the expense of prolonged cyanosis and increased risk of paradoxical embolism.

METHODS: To assess fenestration utility, we retrospectively compared 85 consecutive ECF patients from July 1995 to October 2007 undergoing fenestration (Group F, 39 patients) with non fenestration (Group NF, 46 patients). Preoperatively, cohorts were similar in age, body surface area, ventricular dominance, end-diastolic pressure, oxygen saturation, McGoone ratio and bypass time. Non fenestrated patients were followed longer (F, 28 months; NF, 44 months; P<0.03). Group F received Coumadin and aspirin; NF, aspirin only. Fenestration patency was 85%. Groups were compared using Chi Square and Student t test.

RESULTS: Comparisons at follow up are shown in the Table. These data suggest fenestration of the ECF did not decrease readmission for chylothorax, protect patients from Fontan takedown or reduce early and late mortality. Non fenestrated patients were followed longer (F, 28 months; NF, 44 months; P<0.03). Group F received Coumadin and aspirin; NF, aspirin only. Fenestration patency was 85%. Groups were compared using Chi Square and Student t test.

CONCLUSIONS: This study demonstrates that in the current era fenestration of the ECF should be highly selective, as fenestration does not decrease adverse postoperative outcomes, mortality or hospital stay and is associated with long-term lower systemic oxygen saturation.

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CF21. Impact of Preoperative Enteral Feeding on Perioperative Outcomes in Patients with Hypoplastic Left Heart Syndrome
Christopher D. Derby, Dore Klenk, Christian Pizarro
Alfred I. duPont Hospital for Children, Wilmington, DE

OBJECTIVE: The lack of supportive data regarding the optimal preoperative management strategy for infants with HLHS has led to significant variation in the management of these patients prior to surgery. Gastrointestinal and feeding difficulties frequently complicate the postoperative course of these patients. Our purpose was to identify the incidence of these complications and determine what impact a strategy of preoperative enteral feeding had on perioperative morbidity and the ability to feed by mouth postoperatively.

METHODS: We reviewed the hospital course of 42 consecutive patients with HLHS who underwent surgical palliation over the previous 6 years. Twelve patients were considered high risk due to extreme prematurity and low birth weight and/or considerable cardiac and non-cardiac comorbidities and were excluded from analysis.

RESULTS: Of 30 patients, 15 were fed enterally preoperatively and 15 were kept NPO according to individual surgeon preference. There were no differences in gestational age, weight or age at surgery, or associated comorbidities including preoperative mechanical ventilation between the two groups. Overall survival was 90% (27/30). There were no deaths related to enteral complications. No patients experienced NEC. 93% (14/15) of patients fed enterally before surgery were discharged home on oral feeds. 83% (10/12) of patients NPO before surgery had difficulty feeding postoperatively and required tube feeds at discharge. By univariate analysis, patients fed enterally prior to surgery had shorter mechanical ventilation times (p 0.0003) and fewer postoperative complications (p 0.01). In a logistic regression model, preoperative enteral feeding predicted oral feeding at discharge (OR 77.3, p 0.006) and was associated with a shorter hospital length of stay (p 0.09).

CONCLUSION: In patients with HLHS not considered “high risk”, a strategy of preoperative enteral feeding is safe and is associated with improved perioperative outcomes including the ability to meet full nutritional demands by mouth at discharge. Further follow-up is indicated to determine whether such a strategy sustains appropriate interim growth and/or impacts interim mortality.
*WTSA Member

**CF22. Plasma Proteolytic Profiles in Pediatric Dilated Cardiomyopathy**

Tain-Yen Hsia, Jeremy M. Ringewald, Robert E. Stroud, Scott T. Reeves, Nidhi Kumar, Jeffrey A. Jones, John S. Ikonomidis*, Francis G. Spinale

*Medical University of South Carolina, Charleston, SC*

**OBJECTIVE:** Dilated cardiomyopathy (DCM) is an important cause of heart failure and mortality in both children and adults. Furthermore, DCM is a more progressive disease process in children than in adults. However, the mechanistic explanation for this difference is unknown. In adult DCM, left ventricular remodeling is associated with changes in the myocardial levels of both matrix metalloproteinases (MMPs), and endogenous inhibitors of MMPs (TIMPs). Whether, and to what degree, changes in MMP/TIMP profiles exist in pediatric DCM has not been examined. Accordingly, the present study developed a low blood volume, high sensitivity assay to test the hypothesis that a unique and differential MMP/TIMP profile exists in pediatric DCM patients, which may serve as a biomarker signature for this disease process.

**METHODS:** One ml of blood was obtained from pediatric patients with DCM (n = 7, age 8 ± 7 yrs), and 26 age-matched normal volunteers. Using a high throughput multiplex suspension immunoassay, plasma levels were quantified for the following MMP classes: gelatinases (MMP-2, -9), collagenases (MMP-8, -13), lysins (MMP-3, -7), and all 4 TIMPs. Ratios between the MMPs and TIMPs were calculated.

**RESULTS:** Plasma MMP-2, -7, -8 and -9 levels were increased by >2-fold in DCM patients compared to normal controls (p < 0.05; see Figure). DCM patients also had significantly higher levels of TIMP-1 and -4 (298% and 230% respectively; p < 0.05). Furthermore, MMP-2/TIMP-2, MMP-7/TIMP-2, MMP-8/TIMP-2, MMP-9/TIMP-2, and MMP-9/TIMP-4 ratios in DCM patients were increased by 176-315% compared to normal controls (p < 0.05).

**DISCUSSION:** Pediatric DCM patients exhibit robust increases in plasma levels of a broad range of MMPs, having proteolytic activities against all components of the extracellular matrix. The increased MMP/TIMP ratios observed in pediatric DCM patients suggest a heightened proteolytic state, which could promote more progressive myocardial remodeling. Moreover, since TIMP-4 is cardiovascular specific, plasma MMP/TIMP-4 profiles could serve as a non-invasive biomarker for the degree of myocardial remodeling in pediatric DCM. These results demonstrate that MMP/TIMP profiling can be translated to pediatric patients, using a small volume-high sensitivity approach. MMP/TIMP profiling may provide a novel biomarker platform for screening, prognosis and treatment algorithms in pediatric DCM.
CF23. Extended Donor Ischemic Time Is Not Associated with Poor Outcome in Pediatric Heart Transplantation
Francisco Gensini, Justin Linam, Yuk Law, Lester Permut*, D. Michael McMullan, Andrea Morscheck, Robert Boucek, Gordon Cohen*
Seattle Children’s, Seattle, WA

BACKGROUND: The donor pools of many pediatric heart transplant centers are limited. Expanding donor criteria to include extended cardiac ischemic times (greater than 4 hours) would greatly enlarge donor pools. However, the significance of extended donor ischemic time (DIT) is not well known in pediatric heart transplantation. We examined our center’s outcomes using extended DIT as a risk factor.

METHODS: All transplants from 1994 to 2008 were included in the analysis. Subjects were divided into group A, DIT ≥ 4 hours, and group B, DIT < 4 hours. We used statistical methods to evaluate DIT as both a categorical variable (≥4 hours) and continuous variable vs. survival at several post-operative time points. We also analyzed DIT vs. 23 other perioperative data points to assess potential confounding variables within the groups.

RESULTS: There were 49 transplants performed during the study period. Group A (n = 31, 52% male) had a mean age of 4.7 ± 5.0 years (range: 0.0–14.8). Group B (n = 18, 50% male) had a mean age of 8.3 ± 6.1 years (range: 0.2 – 17.6). There were 7 deaths (22.6%) in group A: 5 early (pre-discharge) and 2 late. Causes of death were renal failure (3), acute rejection (2), multiple organ system failure (1), and sepsis (1). There were 3 deaths (16.7%) in group B: 2 early and 1 late. Causes were acute rejection (2) and multiple organ system failure (1). Fisher’s exact test did not show a statistical difference in survival between the groups (p = 0.572). Logistic regression failed to show extended DIT (as a continuous variable) to be a risk factor for mortality (p = 0.430). DIT did not correlate with any of the other perioperative variables analyzed. Of note, patients in the extended DIT group were more likely to require mechanical cardiopulmonary support (p = 0.088) or to have poor ventricular function post-transplant (p = 1.000).

CONCLUSIONS: Extended DIT was not associated with poor outcome in our study. Pediatric transplant centers with limited donor pools should consider accepting hearts with DIT >4 hours

* WTSA Member
RESULTS: See Table. Pre-BCPS assessment showed that Group 1 (conventional) was older (30 ± 41 months vs. 10 ± 14, p = 0.007), weighed more (11.6 ± 11 kg vs. 6.6 ± 2.5, p = 0.017), and had lower arterial saturation (71.3 ± 5% vs. 79.4 ± 4.2, p < 0.0001). There were no differences in SVC and Nakata indices between the groups. Pre-Fontan assessment showed equivalent SVC and Nakata indices. The central PA index and subsequent central PA/Nakata index ratio were significantly higher in Group 2. There were no differences in freedom from death or transplant (Group 1 vs. Group 2, 75% vs. 86.7% at 1 year, 69.4% vs. 75.6% at 3 years, p = 0.53), freedom from all re-interventions (78% vs. 81% at 1 year, 63% vs. 81% at 3 years, p = 0.16), and freedom from SVC and/or PA thrombosis (92% vs. 93% at 1 year, p = 0.11). On logistic regression, the risk factors for death included the presence of total anomalous pulmonary venous return (TAPVR) (p = 0.02) and small SVC index (p = 0.03). The risk factors for re-intervention included the conventional surgical technique (p = 0.01), old age at repair (p = 0.001), and small Nakata index (P = 0.05). The risk factor for thrombus included small SVC (p = 0.001), small Nakata index (p = 0.03), and low arterial saturation after BBCPS (p = 0.002).

CONCLUSIONS: Technical modifications for BBCPS were associated with improved central PA growth and less re-interventions after BBCPS. Risk for death and or thrombus was related to non-technical factors of TAPVR and a small SVC indexed size. A larger cohort would be required to determine if the trends of less thrombus formation and higher survival associated with the technical modifications are statistically real.
16.+ Validating the Use of siRNA as a Novel Technique for Cell Specific Target Gene Knockdown in Lung Ischemia-Reperfusion Injury

John Keech, Elizabeth FitzSullivan, Patrick Wolf, Heather Merry, Michael Mulligan*
University of Washington, Seattle, WA

DISCUSSANT: ALEC PATTERSON

BACKGROUND: Short interfering RNA (siRNA) has been reported as an effective method for knockdown of target genes in vitro and in vivo. However, concerns have been raised regarding design, administration, efficacy, specificity and the immunostimulatory potential of siRNA in vivo. No studies have examined siRNA use in lung ischemia reperfusion injury (LIRI) where siRNA may be well suited for practical pretreatment. Studies have demonstrated effective uptake of intravenously administered siRNA by resident inflammatory cells, including alveolar macrophages (AM). We have also previously demonstrated the central importance of the AM in the development of LIRI. We describe the validation of siRNA as a novel technique for cell specific target gene knockdown in the AM in our model of LIRI.

METHODS: To determine the lowest effective dose of siRNA, Rats received between 1 and 50 nM siRNA (TLR-4, TLR-2, MyD88), vector control or saline control intravenously in a lipid vector prior to the IR protocol. Primary cultures of AM, PAEC, and T2P received between 10 and 1000 pM siRNA with similar controls prior to our hypoxia reoxygenation (HR) protocol. 3 distinct sequences for TLR-4, TLR-2 and MyD88 siRNA were tested for efficacy. Whole lung homogenates, individual cell populations eluted from lungs, and cell culture lysates were harvested for total protein to assess target protein knockdown by Western blot analysis. Serum from rats and media from cell cultures was assessed for IFN and IFN production after siRNA administration. Biotin labeled TLR-4 siRNA was used to assess siRNA uptake in vitro and distribution in the lung by IHC.

RESULTS: Rats pretreated with TLR-4 siRNA had a 70-92% reduction in TLR-4 protein expression, and demonstrated significant protection from LIRI. Cell populations eluted from lungs and whole blood from rats treated with TLR-4 siRNA had a >90% reduction in TLR-4 protein expression in AM and no reduction in TLR-4 expression in PAEC.

CONCLUSIONS: We have demonstrated the cell specific uptake of intravenously administered siRNA to the AM in the lung, and employed a series of controls for OTE, validating the efficacy, specificity and immunostimulatory potential with low dose siRNA in our model of LIRI. These results significantly increase the confidence with which the observed phenotype (protection from IR or HR) can be ascribed to knockdown of the target protein, and provide a tool for studying the central role of the AM in the development of LIRI.
17. Is Robotic Mitral Valve Repair a Reproducible Approach?
Cedars Sinai Medical Center, Los Angeles, CA

DISCUSSANT: JAMES M. BROWN

BACKGROUND: Dr. W. Randolph Chitwood’s experience with Robotic Mitral Valve repair (R-MVr) and convincing enthusiasm as well as extraordinary results motivated our team to initiate a similar program in June of 2005. At the time there were 4 centers in the United States performing R-MV surgery. We present our initial evaluation of the first 100 R-MVr procedures performed at our center.

METHODS: We reviewed the overall surgical outcome of our first 100 R-MVr consecutive procedures (daVinci Surgical System; Intuitive Surgical, Inc. Sunnyvale, Ca) performed between June 2005 and November 2008. The repairs were also grouped by predominant leaflet pathology: posterior leaflet (n = 75), anterior leaflet with or without posterior leaflet involvement (n = 21), functional (n = 4). All patients received an annuloplasty ring that may have included one or more of the following: leaflet resection (triangular or quadrangular) sliding plasty, chordal transposition and or chordal replacement and edge-to-edge approximations. Pre, perioperative and postoperative patient characteristics including follow-up and early and late echocardiographic (echo) findings were obtained from a hospital quality assurance database.

RESULTS: Overall mean age was 58.9 ± 10.8 years, 66 males and 34 females. There was 1 hospital mortality. Five patients required mitral valve replacement, two patients <24 hrs, and 3, 6 and 41 days post-RMVs. Postoperative complications: 2 strokes, 1 transient ischemic attack, 1 liver laceration, 1 phrenic nerve paralysis and 6 reoperation for bleeding. Post-pump mitral regurgitation (MR) grades: none/trivial 80; mild 17; moderate 2 and severe 0. Greater than 30 day follow-up (F-U) echo was obtained in 74 patients, median 411 days. Echocardiographic measurements included: MR grade, left ventricular end diastolic dimension, cm (LVEDD), left atrial diameter, cm (LA diam) and ejection fraction, % (EF). There was a clinically significant decrease in LVEDD and LA diam at F-U. There was a trend for shorter pump time in the last 30 patients (158 ± 30 min.) compared with the first 70 patients (173 ± 61 min.), p = 0.11.

CONCLUSIONS: We found that the learning curve is steep and long. Training of the surgeon and surgical team provided by the manufacture of the robotic system is less than optimal due to time constraints that prove short and incomplete. Some complications such as liver puncture, phrenic paralysis and endo-balloon complications are nearly exclusive to this approach. With time the team becomes very comfortable with the technology and the results tend to improve. In particular the operating room time and CPB time tend to decrease. From carefully selecting patients with appropriate pathology we have progressed to include nearly any form of degenerative mitral valve disease, including Barlow syndrome with results comparable to the standard approach.

Overall Echocardiographic Findings (n = 100)

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Echo Results; Posterior leaflet (n = 75)

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* WTSA Member
BACKGROUND: Resection of early stage lung cancers is increasingly being performed utilizing a VATS approach. Both anatomic segmentectomy and lobectomy represent reasonable alternatives in the management of Stage I NSCLC. Little data currently exists directly comparing these VATS techniques. In the current study, we compare the perioperative and early oncologic results of VATS anatomic segmentectomy with VATS lobectomy for Stage I NSCLC.

METHODS: A total of 109 consecutive VATS anatomic segmentectomies were performed for Stage IA (n = 68) or IB (n = 41) NSCLC from 2002–2008. VATS lobectomy was performed in 127 patients for Stage IA (n = 70) and IB (n = 57) during the same period. Primary outcome variables included hospital course, complications, mortality, recurrence patterns and survival. Statistical analysis included the t-test and Fisher’s exact test. The probability of overall and recurrence-free survival was estimated with the Kaplan-Meier method, with significance being estimated by the log rank test.

RESULTS: Mean age was 70 years among segments and 67 among lobes (p = 0.002). Gender distribution and tumor histology were similar between the VATS segmentectomy and lobectomy groups. Average tumor size was larger in the lobectomy group (2.6 cm) compared with segment group (2.1 cm; p = 0.008). Mean follow-up was 13.6 months for segments and 17.8 months for lobes. VATS segmentectomy was associated with decreased operative time when compared to VATS lobectomy [Table]. There was 1 (0.9%) conversion in the VATS segmentectomy group, compared with 7 in the VATS lobectomy group (5.9%; p = 0.22). There were no significant differences in length of stay, perioperative morbidity, mortality or recurrence rates when comparing VATS segmentectomy to VATS lobectomy. Locoregional recurrence rates (4.6% vs. 3.9%) were similar between VATS segmentectomy and VATS lobectomy groups, respectively (p = 1.00). There were no significant differences in recurrence free or overall survival.

CONCLUSIONS: VATS segmentectomy and lobectomy can be performed safely with acceptable perioperative course, morbidity, mortality and recurrence rates. VATS segmentectomy can be performed with early outcomes similar to VATS lobectomy. The potential benefits of VATS segmentectomy compared with VATS lobectomy will need to be further evaluated by prospective, randomized trials (CALGB 140503).
OBJECTIVES: Prevalence of heart transplantation (HTx) in adults (18–45 years) with congenital heart disease (ACHD) is projected to increase, yet no large studies have defined how these challenging patients differ from other adult recipients (AR). We sought to determine evolution of outcomes and risk-factors for mortality and retransplantation (RTx) among ACHD patients compared to other AR.


RESULTS: We identified 8496 patients, of whom 575 were ACHD. Prevalence of HTx among AR decreased by 40% from Era 1 to Era 2 (4033 to 2888, \( P < 0.001 \)), while HTx among ACHD increased by 41% (239 to 336 (\( P < 0.001 \))). ACHD were younger, had longer wait-list times and ischemic times, and were more likely to have preoperative ECMO support (\( P < 0.05 \) for all). Overall use of induction therapy was less prevalent in ACHD (66% vs. 71%; \( P = 0.02 \)). In particular, ACHD patients were less likely to receive either cyclosporine (88% vs. 93%; \( P = 0.02 \)) or azathioprine (63% vs. 74%; \( P < 0.001 \)) with induction, without a corresponding increase in other agents. Maintenance therapy was similar among ACHD and AR, except that steroids were used less frequently in ACHD (92% vs. 98%; \( P < 0.001 \)). Post-HTx survival among AR improved over time (Era1: 1 and 5-year survival 85% and 67%; Era2: 87% and 71%; \( P = 0.02 \)), whereas no era effect was seen for ACHD (Era1: 1 and 5-year survival 76% and 63%; Era2: 75% and 63%, \( P = 0.81 \)). Overall post-HTx mortality (\( P = 0.006 \)), and RTx (\( P = 0.03 \)) were significantly higher for ACHD than AR, mainly due to an early hazard phase (Figure). Multivariable factors associated with increased mortality included ACHD (\( P = 0.03 \)), older age (\( P = 0.001 \)), longer ischemic times (\( P < 0.001 \)), and female gender (\( P = 0.04 \)). Any induction therapy was protective for all recipients against death (\( P = 0.01 \)) and RTx (\( P = 0.04 \)).
BACKGROUND: Despite a paucity of supporting data and established guidelines, percutaneous coronary intervention (PCI) is used with increasing frequency in higher-risk patient populations. RESULTS and outcomes of this strategy in clinical practice remain unknown. The study uses the State of Washington’s database and aims to define the incidence, outcomes and trends of coronary artery bypass grafting (CABG) and PCI in patients with multi-vessel coronary artery disease (CAD) and diabetes mellitus (DM).

METHODS: The State of Washington Clinical Outcomes Assessment Program (COAP) is a prospective clinical database that captures all revascularization procedures (PCI and CABG) and was used to assess and compare the incidence, risk profiles, hospital outcomes and trends of all diabetic patients with multi-vessel CAD (defined as ≥2 vessel CAD with proximal LAD disease) undergoing first time revascularization (no prior intervention). Statistical analysis was conducted using SPSS software and categorical variables were compared with the Chi-squared test and continuous variables were compared with the student’s t-test.

RESULTS: 154,602 patients underwent revascularization in the state of Washington between from 1999 through 2007. 31.6% had multi-vessel CAD (48,860 of 154,602). 11,602 patients with DM and multi-vessel CAD underwent revascularization and were reported to COAP from 1999–2007 and were nearly equally divided between CABG (51%) and PCI (49%). 27.6% (5992 of 21746) of patients undergoing CABG and 20.7% of PCI (5610 of 27114) with multi-vessel CAD had DM. Compared to PCI, patients undergoing CABG had a higher statistically significant (p < 0.0001) incidence of congestive heart failure (24% vs. 18%), cerebrovascular disease (16% vs. 14%), peripheral
vascular disease (17% vs. 14%), 3-vessel CAD (74% vs. 35%), and intra-aortic balloon pump insertion (5.6% vs. 1.7%), but a lower statistically significant incidence of female gender (30% vs. 40%), cardiogenic shock (1.7% vs. 4.3%) and emergency procedures (4% vs. 23%). In the non-emergent setting (elective and urgent), patients undergoing CABG had significantly more 3-vessel CAD (74% vs. 35%, p < 0.0001), more complete revascularization (3.5 ± 1.1 vs. 1.5 ± 0.7 lesions treated, p < 0.0001) but a higher mortality (2.3% vs. 1.1%, p < 0.0001). Other characteristics are summarized in the Table. Further, the incidence of PCI increased from 37.5% to 53.7% over the most recent 4 years.

**CONCLUSIONS:** PCI is applied with increasing frequency to patients with DM and multi-vessel CAD. PCI is used most commonly in patients with 2-vessel CAD or acute (emergent) coronary syndromes with a strategy of more limited and targeted revascularization. CABG is more commonly applied to patients with more extensive disease with more complete revascularization. As both the incidence and percentage of patients undergoing PCI as primary therapy for multi-vessel disease with DM is increasing, long-term consequences of these treatment strategies remain to be defined.

<table>
<thead>
<tr>
<th></th>
<th>CABG (n = 5992)</th>
<th>PCI (n = 5610)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessels Bypassed/ Lesions Treated</td>
<td>3.7 ± 1.1</td>
<td>1.4 ± 0.6</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Hospital Death</td>
<td>2.6%</td>
<td>3.4%</td>
<td>0.013</td>
</tr>
<tr>
<td>Stroke</td>
<td>1.7%</td>
<td>0.5%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Dialysis</td>
<td>1.9%</td>
<td>1.0%</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Hospital Stay (days)</td>
<td>6.7 ± 6.3</td>
<td>2.7 ± 4.0</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

**RESULTS:** Of the 2313 esophageal resections, 80 patients (46 men and 34 women) had undergone previous antireflux surgery. Median age was 63 years (range, 19-92). Median interval between anti-reflux operation and esophagectomy was 43.4 months (range, 1 day-398 months). Indications for anti-reflux surgery were paraesophageal hernia in 22 and gastroesophageal reflux disease in 58. Esophageal lengthening by gastroplasty had been performed in 13 patients. Complications of antireflux surgery were leak in 19, severe dysphagia in 11, and chronic gastropleural fistula in 2. Two antireflux operations had been performed in 24 patients, three in 3 patients, and 4 in one patient. Indications for esophagectomy were benign stricture/perforation in 41, adenocarcinoma in 28 and high grade dysplasia (HGD) in 11. The approach for the esophagectomy was an Ivor Lewis in 38 patients, thoracoabdominal in 29, transhiatal in 10 and McKeown in 3. The conduit used was stomach in 70, jejunum in 6, and colon in 3 (due to inadequacy of the gastric conduit) and one patient had a cervical esophagostomy after resection and was not reconstructed. Jejunostomy feeding tubes were placed in 35 patients. The anastomosis was hand-sewn in 63 patients, and stapled in 16. Five patients received neoadjuvant chemoradiotherapy. The pathologic stage was I in 8 patients, IIA in 7, III in 5, IIB in 3 and IVC in 2. Operative mortality occurred in 3 (3.7%) secondary to respiratory failure in two patients and pulmonary artery rupture in one patient. Postoperative complications occurred in 50 patients (62.5%) and included atrial fibrillation in 19 (23.7%), anastomotic leak in 17 (21.5%), pneumonia in 16 (20%), wound infection in 16 (20%), and prolonged need for mechanical ventilation in 11 (13.7%). Sixteen patients (20%) required reoperation for complications. The leak rate for an anastomosis in the neck was 38.5% compared to 21.4% in the left chest and 13.8% in the right chest. Median length of stay was 11.5 days (range, 7–165). Median follow-up was 43.4 months.
and was complete in 95%. Overall five-year survival was 42.8%; 87.5% and 83.3% in the adenocarcinoma, HGD and benign diagnoses groups respectively.

CONCLUSIONS: Esophagectomy after prior antireflux surgery is challenging. The stomach is usually a suitable conduit for esophageal replacement in these circumstances. An anastomosis in the neck has a significantly higher leak rate than in the chest and should be avoided. The incidence of postoperative complications is high in this group of patients, but operative mortality and long-term survival are comparable to historical controls.

**22. Post Acute Transmurality of Bipolar Radiofrequency in the Clinical Settings: An Electrophysiological Study**

Stefano Benussi¹, Andrea Galanti¹, Valerio Zerbì¹, Massimo Mariani², Ottavio Alfieri¹

¹Hospital San Raffaele, Division of Cardiac Surgery, Milano, Italy ²Thorax Centrum Twente, Enschede, Netherlands

DISCUSSANT: KENT W. JONES

BACKGROUND: Clinical success of surgical ablation for atrial fibrillation (AF) depends upon persistent transmurality of the lesions. Although bipolar radiofrequency achieves acute transmurality and therefore isolation of the pulmonary vein, the post acute fate of this isolation is presently unknown. The aim of this study is to assess short-term pulmonary vein isolation after open chest surgical ablation with bipolar radiofrequency.

METHODS: Thirteen patients with mitral valve disease (mean age: 60 ± 10 years) and AF (persistent/permanent: 7/6) who underwent concomitant mitral valve surgery and ablation with the BP2 bipolar device (®Medtronic Inc., Minneapolis, MN) were prospectively enrolled for electrophysiological assessment. During surgery pairs of temporary wires were positioned on the right superior pulmonary vein (RSPV), left atrium, right atrium and right ventricle. Entrance block (abatement or disconnection of atrio-gram potentials) and exit block (no entrainment at pacing threshold = 10mA) were assessed before and after ablating, 1 week and 3 weeks after surgery, respectively. Isolation of the RSPV was defined by the presence of bidirectional block between the isolated segment and the remaining atrial regions. After isolation of the RSPV was obtained, one additional ablation line was added in each patient.

RESULTS: Before ablation, RSPV pacing threshold was 2.9 ± 1.6 mA. After an average of 3 ± 1 ablations, isolation was obtained in all RSPVs. At 1 week after surgery, the electrophysiological study confirmed the complete isolation in all cases. At 3 weeks 11/13 were still isolated (85%). All patients were discharged in sinus rhythm. At follow-up (19 ± 7 months) 12/13 patients were in sinus rhythm (92%).

CONCLUSIONS: Surgical ablation with bipolar radiofrequency grants a complete transmurality 1 week after surgery. However, complete transmurality tends to decline 3 weeks after surgery. In fact, according to our findings, total isolation of the pulmonary veins with the BP2 ablation device declines from 100% to 85% of cases after 3 weeks. Therefore, we conclude that a complete transmurality with bidirectional block at the time of surgery does not guarantee effective pulmonary vein isolation at follow-up.
Graduating Cardiothoracic Surgeons Should Get a Learner’s Permit, Not a Driver’s License

Moderator: Arvind Koshal
Pro: Ross M. Ungerleider
Con: Edward D. Verrier

ANNUAL BUSINESS MEETING (Members Only)
Van Horne Ballroom A

FAMILY LUNCHEON, Upper Bow Valley Terrace

KIDS BANQUET, Ivor Petrak Room

PRESIDENT’S RECEPTION AND BANQUET (Black Tie Optional)
Reception: Riverview Lounge
Banquet: Cascade Ballroom
Section 3.
A candidate for active membership must:

a. Be a Diplomat of the American Board of Thoracic Surgery of the United States, a Fellow in the Cardiovascular and Thoracic Surgery in the Royal College of Surgeons of Canada, or possess such educational credentials as judged equivalent by the Council.

b. Reside within or have completed a cardiothoracic residency training program within the geographic limits of the Association, which are the states of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, and the provinces of Alberta and British Columbia.

c. Have been engaged in the practice of thoracic and cardiovascular surgery either outside of or within the geographic limits of the Association for at least three years following completion of postgraduate training. If a candidate has completed his/her thoracic surgical residency in an institution within the geographic limits of the Association, such completion may count towards one of the three years of practice as noted above.

d. Have demonstrated interest in advancing the practice of thoracic and cardiovascular surgery through continuing professional contributions and scientific publications.

e. Have obtained the sponsorship of members of the Association as provided in the By-Laws.

Section 4.
All members in good standing of The Samson Thoracic Surgical Society in June, 1983 shall become members of the Association.

Section 5.
Charter members. Charter membership in the Association shall be accorded to those members who were charter members in good standing of The Samson Thoracic Surgical Society in June, 1983.

Section 6.
The privilege of continuing membership shall be subject to adherence to the provisions of the Constitution and By-Laws of the Association.
ARTICLE VII. AMENDMENTS
Proposed amendments to the Constitution shall be submitted in writing to the members at least 30 days prior to a regular business meeting at which the proposed amendments shall be presented to the membership. Notice of such proposed amendments shall be mailed to each member at least thirty days prior to the next regular meeting at which the vote shall be taken. An affirmative vote of two-thirds of the members present is required to adopt an amendment to the Constitution.

ARTICLE I. APPLICATION FOR ACTIVE MEMBERSHIP
Section 1. Applicant.

a. An applicant for Active membership shall obtain a sponsor who is a member of the Association and who, attesting to the applicant's professional competence and ethical behavior, shall obtain for him from the Chairman of the Membership Committee the application form and a list of the qualifications for Active membership.

b. An applicant for Active Membership shall (1) have a full and unrestricted license to practice medicine in his or her respective state or province, and (2) have a current appointment on the surgical staff of a hospital with no reportable action pending which could adversely affect such applicant's staff privileges at any hospital.

c. Any applicant for Active Membership must possess ethical and moral fitness, as well as professional proficiency, as determined, in part, on the basis of reports from members consulted as references, reports from other references and other information.

Section 2. Candidate.
An applicant shall become a candidate for membership upon receipt by the Chairman of the Membership Committee of a properly executed application form and the written recommendation of three members, including his sponsor, attesting to his professional competence and ethical behavior. The names of all candidates shall be included in the notice of the regular meeting.

Section 3. Election to Membership.
Candidates recommended by the Membership Committee and approved by the Council shall be submitted to a vote at the Annual Business Meeting. Election to Active membership shall require an affirmative vote of the majority of members present.

Section 4. Notice of Election.
Every newly elected member shall be furnished by the Secretary with an official notice of election, accompanied by a copy of the Constitution and By-Laws. A Certificate of Membership signed by the President, the Secretary, and the Chairman of the Membership Committee bearing the Seal of the Association shall be presented to the newly elected members at the first session of the next regular meeting immediately following their election.
Section 5. Candidates Not Elected.
The Secretary shall notify the primary sponsor of candidates not recommended for election and separately notify the candidate.

Section 6. Re-application.
An unsuccessful candidate may reapply for membership by submitting a written request and obtaining new sponsor letters, which may be obtained from the same persons who previously submitted sponsor letters. Re-application shall not be permitted more than two times.

ARTICLE II. MEMBERS
Section 1. Active Members.

a. Duties and Rights. It shall be the duty of each Active member to attend regularly the meetings of the Association, to participate in the Scientific Programs, and to uphold the ideals and objectives of the Association. Each Active member shall be entitled to one vote and may hold any office in the Association.

b. Dues. All Active members shall pay dues. The amount of dues may be changed upon the recommendation of the Council and approval of the majority of the members present at the Annual Business Meeting. Dues shall be payable on April 16th of each year. Members may not attend a meeting unless their dues are current.

c. Number of Members. The number of Active members residing within the geographic limits of the Association shall be limited to two hundred and fifty (250).

d. Moving Outside Geographic Limits. Active members who move outside the geographic limits of the Association may maintain their status and shall not be limited in number. They shall be exempt from the Annual Meeting attendance requirement under Section 1(f) below.

e. Delinquency. The Treasurer shall submit to the Council a list of the members who have failed to pay their dues by March 31st of each year, and notice of such delinquency shall be mailed to each such member at the address recorded in the records of the Association. If the delinquency is not made good within three (3) months of the mailing of such notice, or excused for adequate cause by the Council, the membership of each delinquent member shall be subject to termination pursuant to Section 1(g) following.

f. Nonattendance. The membership of any member who fails to attend three (3) consecutive meetings of the Association, unless such nonattendance is excused by the Council for adequate cause, shall be subject to termination pursuant to Section 1(g) below.

g. Termination Procedure. Any member whose membership has become subject to termination for delinquency or nonattendance shall be given written notice of such prospective termination not less than forty (40) days before the effective date of the termination. Any member who is subject to termination may apply for reconsideration by filing a written request with the Council, addressed to the Secretary, within thirty (30) days following the mailing of notice of such termination, which request shall state the reasons why such membership should not be terminated. If such a request is received within the requisite period, termination will be delayed until after the next Council meeting. If the Council finds the reasons given in the request to be adequate, membership shall not be terminated, conditioned upon payment of any arrears, where applicable. If the Council finds the reasons given in the request not to be adequate, the termination shall become effective on the sixth day after the Council meeting.

h. Disability. A member who becomes disabled may petition the Council for senior membership status and the Council may grant such request for a period of time until the member can return to practice.

i. Resignation. A member may resign from the Association at any time by tendering a resignation in writing and paying in full any dues or obligations owing the Association at the time.

Section 2. Senior Members.
Senior membership shall be obtained by written request and Council approval for members retired from active practice at age 60 or shall be automatic at age 65 provided that continuing active membership without respect to age shall be granted on written request. Senior members shall have the same duties, rights and privileges as active members except that they shall be exempt from dues and meeting attendance requirements and shall not hold office, except the office of the Historian. Their numbers shall not be limited.
SECTION 3. Honorary Members.
Honorary membership shall be granted to persons deemed suitable by reason of special contributions in the field of thoracic and cardiovascular surgery or professional accomplishments. Such persons need not be certified thoracic surgeons. Persons deemed suitable as Honorary members may become such when proposed by two members, endorsed by the Membership Committee and the Council, and approved by a majority of the members present at the next meeting. Honorary members shall be exempt from dues and meeting attendance requirements and shall have no rights to vote or hold office except as provided below. The Editor of THE JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY shall be an honorary member of the Association and ex-officio member of the Council without vote.

a. Conduct. A member of the Association shall conduct his relationship with patients, fellow physicians, and the public at large in a manner consistent with the Principles of Medical Ethics of the Society of Thoracic Surgeons, and with the purposes of this Association.

b. Discipline. Upon the recommendation of the Ethics Committee, the Council may take disciplinary action against a member for conduct inconsistent with the provisions of this Section or with the purposes of the Association. Any question concerning the conduct or discipline of a member shall be directed to the Chairman of the Ethics Committee. In the event that the Ethics Committee determines that disciplinary action should be considered in a particular case, the Committee shall submit to the Council a written recommendation of the disciplinary action which the Committee proposes be taken.

Such determination by the Ethics Committee shall be made only after the member has been given not less than thirty (30) days written notice of the date, time and place of the Committee's meeting, and of the nature of the complaint regarding the conduct of the member or charges against the member which are considered by the Committee, and informing the member that he may appear in person and/or by a representative and may submit whatever information he deems proper to refute the charges under consideration.

In the event that the Ethics Committee recommends to the Council that disciplinary action be taken against a member, such member shall be given thirty (30) days written notice of the time and place of the Council meeting at which such recommendation is to be considered, and of his right to appear in person or by representative to submit whatever information he deems appropriate to refute the recommendation of the Committee. Disciplinary action may consist of censure, probation, suspension, or expulsion from membership, as deemed appropriate by a majority of the Council following hearing and consideration as set forth above. No such disciplinary action shall become effective less than five (5) days after the scheduled date of the Council meeting at which the member had the opportunity to refute the Committee's recommendation.

ARTICLE III. OFFICERS
Section 1. Nomination and Election.
Candidates for election as Vice President, Secretary, Treasurer and Councillor-at-Large shall be placed in nomination by the Nominating Committee. Nominations for any of these offices may also be made from the floor. An affirmative vote by the majority of the members present at an Annual Meeting shall be required for election to office. The Vice President, Secretary and Treasurer shall be elected annually, and will hold office from the termination of the meeting at which elected until the termination of the next regular meeting when their successor will be elected. The Vice President shall become the President upon completion of his term as Vice President.

Section 2. Duties of the President.
The President shall be the chief executive officer of the Association and shall have general supervision over the business of the Association, subject to the control of the Council. He shall preside at all meetings and generally perform all duties incident to the office of President, together with such other duties as may from time to time be delegated to him by the Council.

Section 3. Duties of the Vice President.
The Vice President shall perform the duties of the President in the absence or inability to act of the President, and such other duties as set forth in these By-Laws or as may from time to time be delegated to him by the Council.

Section 4. Duties of the Secretary.
The Secretary shall certify and maintain the records of the Association, including a copy of the Constitution and By-Laws, together with any amendment thereto, and a record of the names, classifications, and addresses of the members. The Secretary shall keep minutes of the meetings of the Association, file all non-financial reports required by law and shall send all notices required by law, by these By-Laws, or by direction of the Council, and shall perform such other duties as may be assigned by the Council.
Section 5. Duties of the Treasurer.
The Treasurer shall receive and have charge of all funds of the Association, subject to the direction of the Council. He shall perform the usual duties incident to the office of the Treasurer, including the collection of dues, the payment of the Association's bills and obligations as approved by the Council, and the preparation, submission to the Council and presentation to the members of an annual financial report, including any that may be required by statute, together with such additional duties as may from time to time be assigned to him by the Council. The financial affairs and the financial statements of the Association shall be audited by an Audit Committee of members, or by an outside auditor as determined from year to year by the Council.

Section 6. Duties of the Editor.
The Editor of THE JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY shall be the Editor of the Association and shall be an ex-officio member without vote of the Program Committee and the Council. The Editor shall be appointed annually by the Council. The Editor shall serve as advisor to the Association on standards for editing and review for publication of manuscripts and proceedings of the Association.

Section 7. Duties of the Historian.
The Historian shall be the Parliamentarian and Historian of the Association and shall act as its public relations and press representative, and perform such other duties as may from time to time be delegated to him by the Council. The Historian shall be appointed annually by the Council.

Section 8. Duties of the Representative to the American College of Surgeons Board of Governors.
The representative to the Board of Governors of the American College of Surgeons shall represent the membership of the Association to the American College of Surgeons' Board of Governors in accordance with the duties of a specialty society Governor. Such Governor shall be appointed by the American College of Surgeons from nominees submitted by the Council of the Association and shall serve on the Council as an ex-officio member without vote.

Section 9. Compensation of Officers.
No Officer of the Association shall receive any compensation for his services, but may be reimbursed for expenses when authorized by the Council.

ARTICLE IV. COUNCIL

Section 1. Composition of the Council.
The Council shall be composed of the President, Vice President, Secretary, Treasurer, Immediate Past President, (3) Councillors-at-Large, up to (2) Councillors/Founders and ex-officio, without vote, the Historian, Editor, and Representative to the Board of Governors of the American College of Surgeons.

Section 2. Councillors-at-Large.
One Councillor-at-Large may be elected at each Annual Business Meeting by majority vote and serve three years.

Section 3. Duties of the Council.
The Council shall exercise all corporate powers, excepting as otherwise provided in the By-Laws. The Council shall appoint the Historian and the Editor, and may in its discretion appoint an Assistant Secretary or Assistant Treasurer.

Section 4. Liability of Councillors.
A Councillor shall have no liability based upon any alleged failure to discharge his obligations as a Councillor, except for any self-dealing transaction prohibited by law.

Section 5. Compensation of the Council.
No Councillor shall receive any compensation for serving as a Councillor of the Association, but may be reimbursed for expenses when authorized by the Council.

Section 6. Council Meetings.
   a. Regular and Special Meetings. The Council shall hold regular meetings just before the beginning of the Annual Meeting of members, and shall hold such additional meetings as shall be called from time to time by the President or by any two voting members of the Council.
   b. Notice. Meetings of the Council shall be held upon four days' notice by first class mail or 48 hours' notice delivered personally by telephone or telegraph. Notice of regular meetings need not be given if the time and place of such meeting has been set previously by the Council. Notice of a meeting need not be given to any Councillor who signs a waiver of notice or a written consent to holding the meeting or an approval of the minutes thereof, whether before or after the meeting, who attends the meeting.
without protesting, prior thereto or at its commencement, the lack of such notice to such Councillor. All such waivers, consents and approvals shall be filed with the corporate records or made a part of the minutes of the meetings.

c. **Quorum.** The presence of five (5) voting members of the Council shall constitute a quorum for a Council meeting.

d. **Telephone Conference.** Council members may participate in a meeting through the use of a conference telephone or similar communications equipment, so long as all members participating in such meeting can hear one another. Participation in a meeting pursuant to this section constitutes presence in person at such meeting.

e. **Manner of Acting.** Every act or decision done or made by a majority of the Councillors present at a meeting duly held at which a quorum is present is an act of the Council. A meeting at which a quorum is initially present may continue to transact business, notwithstanding the withdrawal of Councillors, if any action taken is approved by at least a majority of the required quorum for such meeting.

f. **Adjournment.** A majority of the Councillors present, whether or not a quorum is present, may adjourn any meeting to another time and place. If the meeting is adjourned for more than 24 hours, notice of such adjournment shall be given prior to the time of the adjourned meeting to the Councillors who were not present at the time of the adjournment.

**ARTICLE V. EXECUTIVE DIRECTOR**

The Council may appoint an Executive Director, who shall be responsible for the operational management of the affairs of the Association, under the executive direction of the Officers in their respective areas of responsibility. The Executive Director shall be bonded in an amount sufficient to safeguard the financial assets of the Association.

**ARTICLE VI. COMMITTEES**

Section 1. Standing Committees.

The Standing Committees of the Association shall be:

a. **Membership.** The Membership Committee shall consist of a Chairman and five members, each to serve for a term of three years provided that the terms are initially arranged such that two members retire each year. The Committee shall formulate and recommend to the Council, rules governing the qualifications and procedure with respect to elections of new members and, when appropriate, a recommendation as to the numerical limitations upon each type of membership. The Committee shall consider all applications for membership and report their recommendations to the Council for review and for presentation to the meetings of the members.

b. **Program.** The Program Committee shall consist of a Chairman and five members, each to serve for a term of three years, provided that the terms are initially arranged so that two members retire each year. The President, Secretary, and Editor shall also serve as members ex-officio without vote. It shall be the responsibility of the Program Committee to make all arrangements necessary to provide scientific sessions of high quality. The Program Committee shall submit a budget of expenses for the program, and the names of persons to be invited as guest speakers, to the Council for approval before making any final commitments regarding the expenses and guest speakers. The Program Committee shall have the additional responsibility of the initial editorial review of all manuscripts presented at the regular meeting before they are submitted to the Editor.

c. **Local Arrangements.** The Local Arrangements Committee shall consist of a Chairman and as many members as are deemed appropriate by the Council. The Committee shall serve for a term of one year. The responsibility of the Committee shall be to make the general arrangements for the Annual Meeting and to submit a report and budget for such arrangements to the Council at least thirty days before such Annual Meeting.

d. **Nominating.** The Nominating Committee shall consist of the five most recent surviving Past Presidents of the Association. The most senior Past President shall serve as Chairman. The Committee shall prepare a slate of nominees to fill any vacancies among the Officers and Council which exist or will occur at the time of the Annual Meeting. The Committee shall submit its proposed slate to the Council before presentation to the members at the Annual Meeting.
e. Ethics. The Ethics Committee shall consist of the three most recent surviving Past Presidents of the Association. The most recent Past President shall serve as Chairman. The Committee shall consider questions of conduct of members and make recommendations to the Council pursuant to Article II, Section 4 of these By-Laws.

Section 2. Appointment.
Appointment to vacant chairmanships or memberships of each Standing Committee, except the Nominating and Ethics Committees, shall be made by the Vice President for the year during which he will be President. The Vice President shall make known to the Nominating Committee and the Council for review and approval his selection of members for the Committee appointments. Vacancies on Committees occurring between regular meetings shall be filled by the President.

Section 3. Special Committees.
The Council from time to time may create such Special Committees and appoint the Chairman and members thereof as it deems appropriate for carrying out the purposes and activities of the Association.

ARTICLE VII. MEETINGS OF MEMBERS
Section 1. Special Meetings.
Special meetings of the members may be called by the President or by 5 percent or more of the members. Any special business meeting of the members called by the President to act on an amendment to the By-Laws shall be approved by the Council.

Section 2. Notice of Meetings.
Notice of each Annual or Special Meeting shall be given appropriately as determined by the President or by the Council to members of record at the close of business on the business day preceding the day on which notice is given, provided that such notice of the Annual Meeting or Special Meeting of the members shall be given to each member by the Secretary in writing at least thirty (30) and not more than ninety (90) days prior to the date thereof.

Section 3. Quorum.
No fewer than fifty (50) member shall constitute a quorum for the transaction of the business of the Association at any meeting. However, if fewer than one-third (1/3) of the members are present at the meeting, the only matters which may be voted upon are those matters as to which proper notice was given.

Section 4. Proposals to the Members.
Proposals concerning the operation or policies of the Association may be brought before meetings of the members upon majority vote of the Council or written request of a majority of the voting members delivered to the Secretary not less than thirty (30) days prior to such meeting. A decision reached at the meeting regarding such a proposal shall be a two-thirds (2/3) vote of the members, assuming a quorum, shall be binding on the Council and the Association.

Section 5. Proxies.
Attendance or voting at a meeting of members by proxy is prohibited and shall be invalid and of no effect.

Section 6. Reports and Papers.
All reports and papers read before the Association at the Annual Meeting shall be deposited with the Secretary at the time of their presentation.

ARTICLE VIII. GENERAL
Section 1. Operation of the Association.
The Association shall operate as set forth in its Articles of Incorporation, Constitution and By-Laws, and its funds, both income and principal, shall be used solely for the purposes therein set forth, no part of the same being available for the benefit of any member or other person, firm or society.

The Treasurer's financial report referred to in Article III, Section 5, shall be considered the Annual Financial Report. The financial report shall be distributed in writing to the members at the Annual Meeting or mailed to the members as the Council determines.

Section 3. Fiscal Year.
The fiscal year of the Association shall be from January 1 through December 31 of the next calendar year.

Section 4. Parliamentary Procedure.
The meetings of the members and Council, excepting as otherwise provided in the By-Laws shall be conducted pursuant to Sturgis Standard Code of Parliamentary Procedure, as set forth in the then current edition of said work.
Section 5. Reserve and Endowment Funds.
The Council may establish a reserve fund and from time to time direct that funds of the Association not required for current operations be transferred to such fund to provide long term financial stability to the Association and to be a means for accumulating funds for future projects. The reserve fund shall be deposited in an insured account or accounts in a savings bank and/or savings and loan association or invested in whole or in part in investments which legally may be made by trustees under the laws of the State of California. The Council may create a Reserve Fund Committee to make recommendations concerning the investment and deposit of the fund. The Council may in its discretion withdraw and use in the current operations of the Association the income of the fund, but withdrawals of principal shall be made only with the approval of the proposed withdrawal and use of the funds by a majority of the Council members present at a meeting.

The Council shall establish a Paul C. Samson Endowment Fund to perpetuate the educational activities of the Association and to underwrite in whole or in part the Paul C. Samson Resident Prize Award.

ARTICLE IX. ASSESSMENTS
If in the judgment of the Council special needs of the Association so require, it may propose an assessment of a specified amount to be charged to each member. Notice of such proposal shall be mailed to the members at least thirty (30) days in advance of the meeting at which the vote is to be taken, and shall be effective if approved by two-thirds (2/3) of the members present at such meeting.

ARTICLE X. GUESTS
Section 1. Guests of the Members.
Each member may invite one guest and accompanying person to meetings of the Association. Members shall notify the Secretary in advance of the names of their guests. The Council shall determine the charge to be made for guests and the expenses relating to the guests’ attendance shall be the responsibility of the member who has issued the invitation.

Section 2. Guests of the Program Committee.
The Program Committee may invite guests to participate in the scientific programs. Such guests shall be expected to bear the expenses related to their participation and attendance at meetings except as provided in Article X, Section 3.

ARTICLE XI. INDEMNIFICATION
The Association shall indemnify any person, who is or was a Councillor, officer, employee or other agent of the Association, to the extent allowed by law, so long as such person acted in good faith, in a manner such person believed to be in the best interests of the Association and with such care, including reasonable inquiry, as an ordinary prudent person in a like position would use under similar circumstances.

ARTICLE XII. DISSOLUTION
Section 1. Voting.
The Association shall not be dissolved except by the affirmative vote of two-thirds (2/3) of the members entitled to vote.

Section 2. Conditions.
In the event of dissolution of the Association in any manner and for any cause, after the payment or adequate provision being made for payment of all of its debts, and liabilities, all of the remaining funds and assets of the Association shall be transferred to a nonprofit fund, foundation or corporation which is organized and operated exclusively for educational or scientific purposes related to the purpose of the Association, and which has established its tax exempt status under Section 501 (c) (3) of the Internal Revenue Code and Section 23701 (d) of the Revenue and Taxation Code of California, or equivalent statutes then in effect.

ARTICLE XIII. AMENDMENTS
Proposed amendments to these By-Laws shall be submitted in writing to the members at a business meeting called for that purpose immediately preceding the one at which the vote is taken. An affirmative vote of two-thirds (2/3) of the members present is required to adopt an amendment to the By-Laws.

Revised: June 1999
June 2000
June 2001
June 2007
Guidelines for Expert Witness Testimony

The Western Thoracic Surgical Association joins with other specialty organizations in emphasizing the obligation of objectivity when its members respond to requests to serve as expert witnesses in the judicial system. The perceived need for a guideline outlining policies and standards for expert testimony was recognized by the Council following a report by the Association’s Ethics Committee of a complaint against a member. Within the legal system the definition of an “expert” is far less stringent than what the medical profession might acknowledge. In a trial the attorneys introduce the qualifications of their experts and their testimony generally embodies relevant facts, the expert’s knowledge and experience, and the expert’s best judgment. Attacks on the credibility of an expert witness are termed impeachments and tactics can be employed during cross-examination to question the expert’s qualifications. It is this issue that the Association wishes to specifically address, the qualifications of an expert. An expert witness should have current experience and ongoing knowledge about the areas of clinical medicine in which they are testifying as well as familiarity with practices during the time and place of the episode being considered as well as the circumstances surrounding the occurrence. The expert witness should be an impartial practicing physician. He or she must not become an advocate or a partisan in a legal proceeding. Truthfulness is essential and misrepresentation or exaggeration of facts or opinions in an attempt to establish an absolute right or wrong may be harmful both to the individual parties involved and to the profession as a whole. The expert’s views must not narrowly reflect applicable standards to the exclusion of the other acceptable choices. The ultimate test for accuracy and impartiality is a willingness to prepare testimony that could be presented unchanged for use by either the plaintiff or the defendant. The solicitation of physicians to serve as expert witnesses by plaintiff’s attorneys who offer large fees may result in highly biased and inaccurate testimony. The expert witness should possess excellent special knowledge but be cognizant of the limitations of his competence in his own special field, and recognize the possibility of multiple accepted avenues of therapy. The expert witness gives testimony that educates the court and the jury rather than obfuscates and distorts for personal gain.
WESTERN THORACIC SURGICAL ASSOCIATION

PAST PRESIDENTS

David J. Dugan 1974–1977
John C. Callaghan 1984–1985

John E. Connolly 1977–1978
Paul A. Ebert 1981–1982
John R. Benfield 1989–1990

Norman E. Shumway 1979–1980
Robert W. Jamplis 1982–1983
Ivan A. May 1986–1987
Richard P. Anderson 1990–1991

Harold V. Liddle 1979–1980
Lucius D. Hill 1987–1988

The Fairmont Banff Springs, Banff, AB Canada

35TH ANNUAL MEETING

David R. Clarke 2000–2001
Steven W. Guyton 2004–2005

Marvin Pomerantz 1993–1994
Winfield J. Wells 1997–1998
Donald B. Doty 2001–2002

D. Craig Miller 1994–1995
Kent W. Jones 1998–1999

Bradley J. Harlan 1999–2000
Vaughn A. Starnes 2003–2004
Douglas E. Wood 2007–2008
THE SAMSON ENDOWMENT FUND

In 1984, on the tenth anniversary of its founding, the Samson Thoracic Surgical Society changed its name to the Western Thoracic Surgical Association in order to better describe its scope and to gain professional recognition as the major surgical specialty organization it had become. Thereafter, the Council sought a means to perpetuate the name of Paul C. Samson, the patron and inspiration of the society during its early years. Mindful of Paul's legendary warmth and generosity to young surgeons and his lifelong dedication to both graduate and postgraduate surgical education, it was decided to link his name with the activities of the Association that pertained to these interests and in 1985 the Samson Endowment Fund was created.

The Fund is managed as an endowment and the interest accruing to the principal is used exclusively for specific educational purposes. One such purpose is the funding of the Samson Resident Prize Essay which each year brings to the scientific program the best work of residents from thoracic surgical education programs throughout North America and from abroad.

It is suggested that each Member make a contribution of $500 to the Samson Endowment Fund. This may be viewed as a lifetime obligation to be discharged in any manner over any time period the Member chooses. Contribution is entirely voluntary and a failure to contribute is not penalized or singled out in any way. A line item for optional contribution is included on the annual dues statement only as a reminder.
DAVID J. DUGAN DISTINGUISHED SERVICE AWARD

The David J. Dugan Distinguished Service Award of the Western Thoracic Surgical Association is presented to members of the Association in recognition of distinguished achievement and outstanding contributions to the field of thoracic surgery in the areas of science or leadership over a sustained period of time. Nominations for this award are made by the Nominating Committee and are presented to the Council for consideration & approval.

1994  George E. Miller, Jr., MD
      Pebble Beach, California

1997  Edward A. Smeloff, MD
      Sacramento, California

1999  Jack M. Matloff, MD
      Los Angeles, California

2002  Albert Starr, MD
      Portland, Oregon

2004  Leonard L. Bailey, MD
      Loma Linda, California

2005  Bruce A. Reitz, MD
      Stanford, California

2007  W. Gerald Rainer, MD
      Denver, Colorado

2009  Richard P. Anderson, MD
      Seattle, Washington
PAST MEETING HIGHLIGHTS

1975  The Santa Barbara Biltmore Hotel, Santa Barbara, California
President  David J. Dugan
Oakland, California
Secretary  Arthur N. Thomas
San Francisco, California
Local Arrangements Chairman  John F. Higginson
Santa Barbara, California
Samson Resident Prize Essay Award  William R. Brody
Bethesda, Maryland

1976  The Banff Springs Hotel, Banff, Alberta, Canada
President  David J. Dugan
Oakland, California
Secretary  Arthur N. Thomas
San Francisco, California
Local Arrangements Chairman  John C. Callaghan
Edmonton, Alberta, Canada
Samson Resident Prize Essay Award  Joe W. Ramsdell
San Diego, California

1977  The Broadmoor Hotel, Colorado Springs, Colorado
President  David J. Dugan
Oakland, California
Secretary  Arthur N. Thomas
San Francisco, California
Local Arrangements Chairman  Richard G. Sanderson
Tucson, Arizona
Samson Resident Prize Essay Award  J. Nilas Young
Oakland, California

1978  Hotel Del Coronado, Coronado, California
President  John E. Connolly
Irvine, California
Secretary  Arthur N. Thomas
San Francisco, California
Local Arrangements Chairman  Richard G. Fosburg
San Diego, California
Samson Resident Prize Essay Award  James M. Wilson
San Francisco, California

The Fairmont Banff Springs, Banff, AB Canada
35TH ANNUAL MEETING
PAST MEETING HIGHLIGHTS

1979  Sun Valley Lodge, Sun Valley, Idaho
President  Norman E. Shumway
Stanford, California
Secretary  Arthur N. Thomas
San Francisco, California
Local Arrangements Chairman  Harold V. Liddle
Salt Lake City, Utah
Samson Resident Prize Essay Award  Thomas H. Hoffmann
San Antonio, Texas

1980  Tamarron Lodge, Durango, Colorado
President  Harold V. Liddle
Salt Lake City, Utah
Secretary  Arthur N. Thomas
San Francisco, California
Local Arrangements Chairman  W. Gerald Rainer
Denver, Colorado
Samson Resident Prize Essay Award  Robert H. Breyer
Chicago, Illinois

1981  Hyatt Regency Hotel, Maui, Hawaii
President  Bertrand W. Meyer
Los Angeles, California
Secretary  Lucius D. Hill
Seattle, Washington
Local Arrangements Chairman  Quentin R. Stiles
Los Angeles, California
Samson Resident Prize Essay Award  Clifford M. Kitten
San Antonio, Texas

1982  Hotel del Coronado, Coronado, California
President  Paul A. Ebert
San Francisco, California
Secretary  Lucius D. Hill
Seattle, Washington
Local Arrangements Chairman  Richard G. Fosburg
La Jolla, California
Samson Resident Prize Essay Award  Douglas A. Murphy
Atlanta, Georgia
PAST MEETING HIGHLIGHTS

1983  The Broadmoor, Colorado Springs, Colorado
President  Robert W. Jamplis  Palo Alto, California
Secretary  Lucius D. Hill  Seattle, Washington
Local Arrangements Co-Chairmen  James B. D. Mark  Stanford, California
                                    W. Gerald Rainer  Denver, Colorado
Samson Resident Prize Essay Award  Michael L. Dewar  Montreal, Quebec, Canada

1984  Hyatt Regency Hotel, Maui, Hawaii
President  Arthur N. Thomas  San Francisco, California
Secretary  Lucius D. Hill  Seattle, Washington
Local Arrangements Chairman  David J. Dugan  Oakland, California
Samson Resident Prize Essay Award  Keith D. Dawkins  Stanford, California

1985  Hyatt Lake Tahoe, Incline Village, Nevada
President  John C. Callaghan  Edmonton, Alberta, Canada
Secretary  Lucius D. Hill  Seattle, Washington
Local Arrangements Chairman  Edward A. Smeloff  Sacramento, California
Samson Resident Prize Essay Award  George T. Christakis  Toronto, Ontario, Canada

1986  Silverado Country Club, Napa, California
President  Richard M. Peters  San Diego, California
Secretary  Richard G. Fosburg  Del Mar, California
Local Arrangements Chairman  John R. Benfield  Duarte, California
Samson Resident Prize Essay Award  David E. Hansen  Stanford, California

1987  The Broadmoor, Colorado Springs, Colorado
President  Ivan A. May  Oakland, California
Secretary  Richard G. Fosburg  Del Mar, California
Local Arrangements Chairman  Leigh I. G. Iverson  Oklahoma, California
Samson Resident Prize Essay Award  Louis A. Brunsting  Durham, North Carolina

1988  Royal Waikoloa. Waikoloa, Hawaii
President  Lucius D. Hill  Seattle, Washington
Secretary  Richard G. Fosburg  Del Mar, California
Local Arrangements Chairman  Richard P. Anderson  Seattle, Washington
Samson Resident Prize Essay Award  George E. Sarris  Stanford, California

1989  Hyatt Regency Resort, Monterey, California
President  Quentin R. Stiles  Los Angeles, California
Secretary  Richard G. Fosburg  Del Mar, California
Local Arrangements Co-Chairmen  Richard L. Murtland  Monterey, California
                                    Winfield J. Wells  Los Angeles, California
Samson Resident Prize Essay Award  Michael A. Breda  Los Angeles, California

1990  Hotel Del Coronado, San Diego, California
President  John R. Benfield  Sacramento, California
Secretary  D. Craig Miller  Stanford, California
Local Arrangements Chairman  Richard G. Fosburg  La Jolla, California
Samson Resident Prize Essay Award  David Fullerton  Denver, Colorado
## PAST MEETING HIGHLIGHTS

### 1991  
**Westin Hotel, Seattle, Washington**
- **President**: Richard P. Anderson  
  Seattle, Washington
- **Secretary**: D. Craig Miller  
  Stanford, California
- **Local Arrangements Chairman**: Philip C. Jolly  
  Seattle, Washington
- **Samson Resident Prize Essay Award**: John S. Pirolo  
  St. Louis, Missouri

### 1992  
**Hyatt Regency Hotel, Kauai, Hawaii**
- **President**: Richard G. Fosburg  
  La Jolla, California
- **Secretary**: D. Craig Miller  
  Stanford, California
- **Local Arrangements Co-Chairmen**: Edward L. Hurley  
  Sacramento, California  
  Philip W. Wright  
  Honolulu, Hawaii
- **Samson Resident Prize Essay Award**: Luis J. Castro  
  Stanford, California

### 1993  
**La Costa Resort, Carlsbad, California**
- **President**: James B. D. Mark  
  Stanford, California
- **Secretary**: D. Craig Miller  
  Stanford, California
- **Local Arrangements Chairman**: Walter B. Cannon  
  Palo Alto, California
- **Samson Resident Prize Essay Award**: Paul J. Pearson  
  Rochester, Minnesota

### 1994  
**Resort at Squaw Creek, Olympic Valley, California**
- **President**: Marvin Pomerantz  
  Denver, Colorado
- **Secretary**: Kent W. Jones  
  Salt Lake City, Utah
- **Local Arrangements Chairman**: Daniel L. Smith  
  Denver, Colorado
- **Samson Resident Prize Essay Award**: Barbara L. Robinson  
  Rochester, Minnesota

### 1995  
**The Coeur d’Alene Resort, Coeur d’Alene, Idaho**
- **President**: D. Craig Miller  
  Stanford, California
- **Secretary**: Kent W. Jones  
  Salt Lake City, Utah
- **Local Arrangements Chairman**: Ronald P. Grunwald  
  Spokane, Washington
- **Samson Resident Prize Essay Award**: Michael J. Moulton  
  St. Louis, Missouri

### 1996  
**The Grand Wailea Resort, Wailea, Maui, Hawaii**
- **President**: Richard G. Sanderson  
  Tucson, Arizona
- **Secretary**: Kent W. Jones  
  Salt Lake City, Utah
- **Local Arrangements Chairman**: Edward A. Smeloff  
  Sacramento, California
- **Samson Resident Prize Essay Award**: Daniel S. Schwartz  
  New York, New York

### 1997  
**The Silverado Country Club & Resort, Napa, California**
- **President**: Daniel J. Ullyot  
  Burlingame, California
- **Secretary**: Kent W. Jones  
  Salt Lake City, Utah
- **Local Arrangements Chairman**: Michael K. Wood  
  Hillsborough, California
- **Samson Resident Prize Essay Award**: Edward M. Boyle, Jr.  
  Seattle, Washington

### 1998  
**The Chateau Whistler Resort, Whistler, B.C., Canada**
- **President**: Winfield J. Wells  
  Los Angeles, California
- **Secretary**: Vaughn A. Starnes  
  Los Angeles, California
- **Local Arrangements Co-Chair**: W. R. Eric Jamieson  
  Vancouver, B.C., Canada  
  Patricia A. Penkowske  
  Edmonton, Alberta, Canada
- **Samson Resident Prize Essay Award**: Vivek Rao  
  Toronto, Ontario, Canada
PAST MEETING HIGHLIGHTS

1999  The Resort at Squaw Creek, Olympic Valley, California

President  Kent W. Jones  Salt Lake City, Utah
Secretary  Vaughn A. Starnes  Los Angeles, California
Local Arrangements Chairman  J. Edward Okies  Portland, Oregon
Samson Resident Prize Essay Award  Leonard Y. Lee  New York, New York

2000  The Orchid at Mauna Lani, The Big Island, Hawaii

President  Bradley J. Harlan  Sacramento, California
Secretary  Vaughn A. Starnes  Los Angeles, California
Local Arrangements Co-Chairs  Paul B. Kelly and Linda M. Kelly  Fair Oaks, California
Samson Resident Prize Essay Award  Murray H. Kown  Stanford, California

2001  Rancho Bernardo Inn, San Diego, California

President  David R. Clarke  Denver, Colorado
Secretary  Vaughn A. Starnes  Los Angeles, California
Local Arrangements Co-Chairs  Myles S. Guber and Debbie Bishop  Denver, Colorado
Samson Resident Prize Essay Award  Baya Krishnadasan  Seattle, Washington

2002  Big Sky Resort, Big Sky, Montana

President  Donald B. Doty  Salt Lake City, Utah
Secretary  R. Scott Mitchell  Stanford, California
Local Arrangements Chairman  John A. Hawkins  Salt Lake City, Utah
Samson Resident Prize Essay Award  Susan D. Moffatt-Bruce  Stanford, California

2003  La Costa Resort, Carlsbad, California

President  Edward D. Verrier  Seattle, Washington
Secretary  R. Scott Mitchell  Stanford, California
Local Arrangements Chairman  Douglas E. Wood  Seattle, Washington
Samson Resident Prize Essay Award  Albert J. Chung  Seattle, Washington

2004  Wailea Marriott, Wailea, Maui, Hawaii

President  Vaughn A. Starnes  Los Angeles, California
Secretary  R. Scott Mitchell  Stanford, California
Local Arrangements Chairman  Winfield J. Wells  Los Angeles, California
Samson Resident Prize Essay Award  Frederick A. Tibayan  Stanford, California

2005  Fairmont Empress Hotel, Victoria, BC, Canada

President  Steven W. Guyton  Seattle, Washington
Secretary  John A. Hawkins  Salt Lake City, Utah
Local Arrangements Chairman  W. R. Eric Jamieson  Vancouver, BC, Canada
Samson Resident Prize Essay Award  Matthew G. Whitten  Salt Lake City, Utah
Donald B. Doty Award  LDS Hospital  Salt Lake City, Utah

2006  Sun Valley Resort, Sun Valley, Idaho

President  R. Scott Mitchell  Stanford, California
Secretary  John A. Hawkins  Salt Lake City, Utah
Local Arrangements Chairman  Thomas A. Burdon  Stanford, California
Samson Resident Prize Essay Award  T. Brett Reece  Charlottesville, VA
Donald B. Doty Award  James I. Fann  Stanford, California
Norman E. Shumway Award  John A. Hawkins  Salt Lake City, Utah
PAST MEETING HIGHLIGHTS

2007  Hyatt Regency Tamaya Resort & Spa
President  Elliot T. Gelfand
Edmonton, AB, Canada
Secretary  John A. Hawkins
Salt Lake City, Utah
Local Arrangements Chairman  Jorge A. Wernly
Albuquerque, New Mexico
Samson Resident Prize Essay Award  Jayan Nagendran
Edmonton, Canada
Donald B. Doty Award  Gordon A. Cohen
Seattle, Washington
Norman E. Shumway Award  Michael J. Weyant
Aurora, Colorado

2008  Sheraton Keauhou Bay Resort and Spa
President  Douglas E. Wood
Seattle, Washington
Secretary  John A. Hawkins
Salt Lake City, Utah
Local Arrangements Chairman  Michael S. Mulligan
Seattle, Washington
Samson Resident Prize Essay Award  John Keech
Seattle, Washington
Donald B. Doty Award  John D. Mitchell
Denver, Colorado
Norman E. Shumway Award  Joseph S. Carey
Torrance, California

35TH ANNUAL MEETING
The Fairmont Banff Springs, Banff, AB Canada

POSTGRADUATE COURSES AND SPEAKERS

1979  Management of the (Re-Do) Coronary Artery Patient
Edward B. Stinson, MD, Stanford, CA
The Infected Artificial Heart Valve
Edward J. Hurley, MD, Sacramento, CA
Changing Concepts in the Interpretation of Ventricular Filling Pressures
Gregory A. Misbach, MD, San Francisco, CA
Are Randomized Trials Possible for Devices or Surgical Procedures
Lawrence I. Bonchek, MD, Milwaukee, WI

1980  Preoperative Assessment of the Patient with Marginal Pulmonary Function
Richard M. Peters, MD, San Diego, CA
Airway Management
G. Hugh Lawrence, MD, Portland, OR
Postoperative Care of the Patient With Marginal Pulmonary Function
Alan Hilgenberg, MD, Denver, CO

1981  Historical Perspective
John C. Callaghan, MD, Edmonton, Alberta, Canada
Dysxia of Cells
Eugene Robin, MD, Palo Alto, CA
Crystallloid Solution for Myocardial Protection
R. Leighton Fisk, MD, Phoenix, AZ
Blood Cardioplegia for Myocardial Protection
Gerald D. Buchberg, MD, Los Angeles, CA
Before and After – Myocardial Preservation
Shahbudin Rahimtoola, MD, Los Angeles, CA

1982  Current Diagnostics and Drug Therapy For Thoracic Infections
Arnold Weinberg, MD, Boston, MA
Surgical Therapy of Pleural Space Infections
G. Hugh Lawrence, MD, Portland, OR
Post-Operative Mediastinal Wound Infections
E.A. Rittenhouse, MD, Seattle, WA
Current Therapy of Esophageal Perforations
Arthur N. Thomas, MD, San Francisco, CA
POSTGRADUATE COURSES AND SPEAKERS

1983

The Thymus: Master Gland of the Immune System
Robert A. Good, MD, PhD, New York, NY

The Mediastinal Imaging Techniques
James B.D. Mark, MD, Stanford, CA

Surgical Approaches to the Mediastinum
Philip C. Jolly, MD, Seattle, WA

Surgical Oncology of Mediastinal Tumors
John R. Benfield, MD, Los Angeles, CA

1984

The Surgical Management of Aortic Dissection
Paul A. Ebert, MD, San Francisco, CA

Routine Use of the Internal Mammary Artery Conduit for Coronary Bypass:
Late Clinical and Angiographic Follow-Up Studies
U. Scott Page, MD, Portland, OR

Cardiac Trauma
F. William Blaisdell, MD, Sacramento, CA

Physiologic Principles of Coronary Blood Flow as Applied to the Cardiac
Surgical Patient
Julien J.E. Hoffman, MD, San Francisco, CA

1985

Cardiac Support Devices
J. Donald Hill, MD, San Francisco, CA

Cardiac Transplantation – Present Status and Future Prospects
Jack G. Copeland, III, MD, Tucson, AZ

Will the Real Cass Study Stand up?
Richard P. Anderson, MD, Seattle, WA

1986

Cell Membranes – Implications on Cancer Control
Jonathan Singer, MD, San Diego, CA

Pathophysiology of Left Ventricular Dysfunction in a Surgical Perspective
Kirk Peterson, MD, San Diego, CA

1987

Anti-Platelet Therapy – Practical Clinical Strategies for Bypass Graft
Patients
Laurence A. Harker, MD, La Jolla, CA

Platelets, Vasospasm, and Aspirin – Thoughts on the Pathogenesis and
Prevention of Arteriosclerosis
Laurence A. Harker, MD, La Jolla, CA

POSTGRADUATE COURSES AND SPEAKERS

1988

Single Lung Transplantation
F. Griffith Pearson, MD, Toronto, Ontario, Canada

1989

Challenges of the Heights: Limits For Survival
Michael Wiedman, MD, Boston, MA

The Western Thoracic Surgical Association Multi-Institutional Study of
Results In Cardiac Surgery
Forrest L. Junod, MD, Sacramento, CA
Daniel J. Ullyot, MD, San Francisco, CA

1990

Cellular and Molecular Biology of Lung Cancer: Clinical Implications
Martin F. McNeeley, MD, Albany, NY
John D. Minna, MD, Bethesda, MD

1991

Modern Statistical Analysis of Surgical Risks and Outcomes
Gary L. Grunkemeier, PhD, Portland, OR
Eugene Blackstone, MD, Birmingham, AL

1992

Growth Factors in the Injury Response: Developing Strategies To Promote
(And Prevent) Cell Growth
Andrew Baird, MD, PhD, La Jolla, CA
Alain Carpentier, MD, Paris, France

1993

Doing Better, Feeling Worse
Donald Kennedy, PhD, Stanford, CA

1994

Esophageal Carcinoma from Molecular Biology to Esophagectomy
Mark Orringer, MD, Ann Arbor, MI
David Beer, PhD, Ann Arbor, MI

1995

Molecular Genetics of the Marfan Syndrome and Related Connective
Tissue Disorders
Hal Dietz, MD, PhD, Baltimore, MD

Practical Update on Biostatistics for Cardiothoracic Surgeons
Gary Grunkemeier, PhD, Portland, OR

1996

Regulation of Intimal Thickening and Luminal Narrowing After Vascular
Reconstruction: Molecular Mechanisms and Pharmacological Control
Alexander W. Clowes, MD, Seattle, WA
<table>
<thead>
<tr>
<th>Year</th>
<th>Course Title</th>
<th>Speaker(s), Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>What is Wrong with the Failing Heart</td>
<td>William W. Parmley, San Francisco, CA</td>
</tr>
<tr>
<td>1998</td>
<td>The Surgical Treatment of End-Stage Heart Disease by Transplants and Mechanical Devices: Outcomes and Costs</td>
<td>Keith Reemtsma, New York, New York</td>
</tr>
<tr>
<td>1999</td>
<td>The Surgical Profession at the Turn of the Century: Challenges and Opportunities</td>
<td>Samuel A. Wells, Jr, Chicago, Illinois</td>
</tr>
<tr>
<td>2000</td>
<td>The Current Status of Therapy for Thoracic Aneurysms</td>
<td>Denton A. Cooley, Houston, Texas</td>
</tr>
<tr>
<td>2002</td>
<td>Advances in Aortic Surgery</td>
<td>Nicholas T. Kououchoukos, St. Louis, Missouri</td>
</tr>
<tr>
<td></td>
<td>Advances in Congenital Heart Disease Surgery</td>
<td>Frank L. Hanley, San Francisco, California</td>
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<td></td>
<td>Advances in Cardiac Valve Surgery</td>
<td>Robert Karp, Snowmass, Colorado</td>
</tr>
<tr>
<td>2003</td>
<td>Cell Transplantation to Prevent Heart Failure</td>
<td>Richard D. Weisel, Toronto, Canada</td>
</tr>
<tr>
<td>2004</td>
<td>Where, When and How it all Started</td>
<td>Norman E. Shumway, Stanford, California</td>
</tr>
<tr>
<td>2005</td>
<td>Progress Toward A Tissue Engineered Heart Valve</td>
<td>John E. Mayer, Jr, Boston, MA</td>
</tr>
<tr>
<td>2006</td>
<td>Stem Cell Research</td>
<td>Irving Weissman, Stanford, CA</td>
</tr>
<tr>
<td>2007</td>
<td>Frontiers in Disease Phenotyping: The Example of Organ Transplantation</td>
<td>Philip F. Halloran, Edmonton, AB, Canada</td>
</tr>
<tr>
<td>2008</td>
<td>Allogeneic Stem Cell Transplantation for Malignant and Nonmalignant Hematologic Disorders</td>
<td>Rainer F. Storb, Seattle, Washington</td>
</tr>
</tbody>
</table>
TSFRE is your Foundation for Research and Education. . .

Unlike other organizations to which you make philanthropic contributions, the Thoracic Surgery Foundation for Research and Education works directly for your specialty. TSFRE supports research and education initiatives to increase knowledge and enhance treatment of patients with cardiothoracic diseases; develops the skills of cardiothoracic surgeons as surgeon-scientists and health policy leaders; and, strengthens society's understanding and trust in the profession.

TSFRE is making a difference in cardiothoracic surgery. This is possible only because of your support. TSFRE is entirely supported through private donations.

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2009 TSFRE RESEARCH AWARD RECIPIENTS

**TSFRE RESEARCH FELLOWSHIPS** provide support of up to $35,000 a year for up to 2 years for surgical residents who have not yet completed cardiothoracic surgical training.

Karen M. Kim, MD, Massachusetts General Hospital
“The Effect of Donor Brain Death and Prolonged Cold Ischemia on Cardiac Allograft Tolerance in Miniature Swine”

Alykhan Nagji, MD, University of Virginia
“Effect of Combined Histone Deacetylase Inhibitors and Proteasome Inhibitors on Epithelial-Mesenchymal-Transition in Non-Small Cell Lung Cancer Cells”

**TSFRE RESEARCH GRANTS** provide operational support of original research efforts by cardiothoracic surgeons who have completed their formal training, and who are seeking initial support and recognition for their research program. Awards of up to $30,000 a year for up to 2 years are made each year to support the work of an early-career cardiothoracic surgeon (within 5 years of first faculty appointment).

Ashish Shah MD, Johns Hopkins University
“Consequences of Phosphodiesterase Type 5 Inhibition on Nitric Oxide Synthase Biochemistry in Experimental Lung Transplantation”

**LUNGevity FOUNDATION/TSFRE RESEARCH FELLOWSHIPS** jointly providing support of $35,000 a year for 2 years.

Onkar Khullar, MD, Brigham & Women’s Hospital
“Prevention of Nodal Metastasis in Lung Cancer via Lymphatic Trafficking of Paclitaxel-Loaded Expansile Nanoparticles”

**LUNGevity FOUNDATION/TSFRE RESEARCH GRANTS** jointly providing operational support of $30,000 a year for 2 years.

Sai Yendamuri, MD, Roswell Park Cancer Institute
“A MicroRNA Profile to Predict Recurrence After Surgical Resection of Stage I Non-Small Cell Lung Cancer”

CAREER DEVELOPMENT AWARD Salary support of up to $50,000 a year for up to 2 years for applicants who have completed their residency training and who wish to pursue investigative careers in cardiothoracic surgery.

Arnar Geirsson, MD, Yale University
“Role of Micro RNA in Cardiac Ischemia and Heart Failure”

2009 TSFRE EDUCATION AWARD RECIPIENTS

**TSFRE/Edwards Lifesciences New and Emerging Technology Fellowship** Providing support of up to $30,000 for a fellow to allow for travel, temporary relocation and training costs associated with participating in a new or emerging technology training program.

Robert Smith, MD, Leipzig Heart Center
“Minimally Invasive/Percutaneous Valve”

Andrea Colli, MD, Leipzig Heart Center
“Endovascular Stents”

Dosmin Dobrescu, MD, Arizona Heart Center
“Endovascular Stents”

**Simulation Grants**—To support the demonstration of the application of simulation in thoracic surgery education.

Emile Bacha, MD, Children's Hospital of Boston
“Improving Performance of Emergent ECMO Cannulation in Pediatric Cardiac Surgery Using High-Fidelity Simulation”

James I. Fann, MD, Stanford University Medical Center
“Simulation in Cardiac Valve Surgery and Cardiac Surgery Crisis Management”

Yvonne Carter, MD, Georgetown University Medical Center
“Development of a Minimally Invasive Simulator for Thoracic Surgery Training”
Eugene A. Grossi, MD, New York University School of Medicine
“Cognitive Task Training for Right Upper Lobe Resection Simulator”

Richard H. Feins, MD, University of North Carolina School of Medicine
“Thoracic Resection Simulation”

Nabil Rizk, MD, Memorial Sloan Kettering Cancer Center
“Thoracic Endoscopic Surgery Simulator”

Ashish Shah, MD, Johns Hopkins Hospital
“Simulation Training for Post Operative Cardiac Instability and Collapse”
**EXHIBITORS**

**EXHIBIT HOURS AND DATES**

- Thursday, June 25: 7:00 am – 12:00 pm
- Friday, June 26: 7:30 am – 12:00 pm
- Saturday, June 27: 6:30 am – 10:30 am

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IS YOUR WTSA MEMBERSHIP INFORMATION CURRENT?

DO YOU HAVE:
A new email address at your office or home?
A new address or phone number?

Please let us know so that your WTSA records stay current, and that all important updates and news reach you.

(Please Print)

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I prefer to receive my mailings at: HOME OFFICE

During the Annual Meeting, you may leave the completed form with the WTSA Registration Desk. You may also fax this form to: 978-524-0498 or mail to:

Western Thoracic Surgical Association
900 Cummings Center, Suite 221-U
Beverly, MA 01915

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*Separate Subscription Required