WTSA

VISION
Build the foundation for the next generation of Cardiothoracic Surgeons

MISSION
Educate in a collegial environment

FUTURE MEETINGS

41st ANNUAL MEETING
June 24–27, 2015
The Fairmont Chateau Whistler
Whistler, British Columbia, Canada

42nd ANNUAL MEETING
June 22–25, 2016
Hilton Waikoloa Village
Waikoloa, Hawaii
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* These sections available on-site in Dana Point, California, or by logging into the Members Only Area of the WTSA Website at http://members.westernthoracic.org.
OFFICERS AND COUNCIL

President
Thomas A. Burdon  
*Stanford, California*

Vice President
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*Seattle, Washington*

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*Honolulu, Hawaii*

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  *Calgary, Alberta*
- Mark T. Metzdorff (2015)  
  *Elmira, New York*

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*Aurora, Colorado*

Editor
Lawrence H. Cohn  
*Boston, Massachusetts*
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INDUSTRY RELATIONS COMMITTEE
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Robbin G. Cohen (2016)
Steven R. DeMeester (2016)
Sean C. Grondin (2016)
John R. Mehall (2016)
Surindra N. Mitruka (2016)
Michael S. Mulligan (2016)

LOCAL ARRANGEMENTS COMMITTEE
Anthony D. and Jennifer Caffarelli, Chair
Daniel L. Serna, Samson Fun Run
Joseph C. Cleveland, Jr., Golf Tournament
Richard I. Whyte, Tennis Tournament

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Michael J. Weyant, Chair (2014)
Craig J. Baker (2014)
Brian S. Cain (2015)
Nahush A. Mokadam (2016)
Paul H. Schipper (2016)

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John C. Chen (2018)
Robbin G. Cohen (2016)
J. Scott Millikan (2015)
Robert C. Robbins (2017)

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Michael P. Fischbein, Chair (2014)
Jessica S. Donington (2016)
John J. Lamberti (2015)
Susan D. Moffatt-Bruce (2016)
Brian L. Reemtsen (2014)
Daniel L. Serna (2015)
Thomas A. Burdon, Ex-Officio (2014)
Lawrence H. Cohn, Ex-Officio (2014)
Patricia A. Thistlethwaite, Ex-Officio (2014)
PROGRAM SUBCOMMITTEES

Adult Cardiac
Michael E. Bowdish (2014)
Steven C. Howe (2014)
Howard K. Song (2014)

Congenital Heart
Richard D. Mainwaring (2014)
David M. McMullan (2014)

General Thoracic
David T. Cooke (2014)
Steven R. DeMeester (2014)
Chuong D. Hoang (2014)
Thomas K. Varghese, Jr. (2014)

REPRESENTATIVES

Representative to the Board of Governors, American College of Surgeons
John D. Mitchell
Aurora, Colorado

Representative to the Advisory Council for Cardiothoracic Surgery, American College of Surgeons
John C. Chen
Honolulu, Hawaii

Representatives to the Thoracic Surgery Foundation for Research & Education
D. Craig Miller
Stanford, California
R. Scott Mitchell
Stanford, California
WEDNESDAY, June 25, 2014

1:00 pm – 6:00 pm  Registration  
Pacific Ballroom Promenade

1:00 pm – 6:00 pm  Speaker Ready Room  
Sorrento

7:00 pm – 9:00 pm  New Members/Welcome Reception  
Sunset Terrace

THURSDAY, June 26, 2014

6:00 am  Samson Fun Run  
Start Line: Hotel Group Entrance

7:00 am – 1:30 pm  Registration  
Pacific Ballroom Promenade

7:00 am – 8:00 am  Breakfast  
Pacific Ballroom 2-3

7:00 am – 12:00 pm  Exhibits  
Pacific Ballroom 2-3

7:00 am – 12:30 pm  Speaker Ready Room  
Sorrento

8:00 am – 9:00 am  Scientific Session I  
Pacific Ballroom 1

9:00 am – 9:05 am  On the 40th Anniversary of the WTSA  
Pacific Ballroom 1

9:05 am – 9:10 am  New Member & Samson Prize Finalist Introductions  
Pacific Ballroom 1

9:10 am – 9:55 am  Presidential Address  
Pacific Ballroom 1

9:55 am – 10:20 am  Coffee Break, Visit Exhibits & Posters  
Pacific Ballroom 2-3

10:20 am – 11:40 am  Scientific Session II  
Pacific Ballroom 1

11:40 am – 11:45 am  David J. Dugan Distinguished Service Award Presentation  
Pacific Ballroom 1
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>11:45 am – 12:30 pm</td>
<td>Invited Guest Speaker &amp; Spouse Forum Session</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>1:30 pm</td>
<td>Dolphin &amp; Whale Watching Safari*</td>
<td>Depart from Hotel Group Entrance</td>
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<tr>
<td>1:30 pm</td>
<td>Paddle Boarding Excursion*</td>
<td>Depart from Hotel Group Entrance</td>
</tr>
<tr>
<td>6:00 pm – 10:00 pm</td>
<td>So-Cal Vintage Beach Party Theme Dinner</td>
<td>Grandlawn North</td>
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**FRIDAY, June 27, 2014**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>7:00 am – 12:00 pm</td>
<td>Registration</td>
<td>Pacific Ballroom Promenade</td>
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<tr>
<td>7:00 am – 8:00 am</td>
<td>Breakfast</td>
<td>Pacific Ballroom 2-3</td>
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<td>7:00 am – 12:00 pm</td>
<td>Exhibits</td>
<td>Pacific Ballroom 2-3</td>
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<td>7:00 am – 12:00 pm</td>
<td>Speaker Ready Room</td>
<td>Sorrento</td>
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<tr>
<td>7:30 am – 9:10 am</td>
<td>Scientific Session III</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>9:10 am – 10:00 am</td>
<td>Postgraduate Course</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>10:00 am – 10:30 am</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Pacific Ballroom 2-3</td>
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<tr>
<td>10:30 am – 11:30 am</td>
<td>Scientific Session IV</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>11:30 am – 12:30 pm</td>
<td>Catheter-Based Mitral Valve Replacement: What Is It and Is It Possible?</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>1:20 pm</td>
<td>Golf Tournament*</td>
<td>Monarch Beach Golf Links</td>
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<tr>
<td>2:00 pm</td>
<td>Tennis Tournament*</td>
<td>The Tennis Club</td>
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<td>Free Evening</td>
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*Separate Subscription Required*
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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>6:30 am – 12:00 pm</td>
<td>Registration</td>
<td>Pacific Ballroom Promenade</td>
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<tr>
<td>6:30 am – 7:30 am</td>
<td>Breakfast</td>
<td>Pacific Ballroom 2-3</td>
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<tr>
<td>6:30 am – 10:30 am</td>
<td>Exhibits</td>
<td>Pacific Ballroom 2-3</td>
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<td>6:30 am – 11:30 am</td>
<td>Speaker Ready Room</td>
<td>Sorrento</td>
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<tr>
<td>7:00 am – 8:15 am</td>
<td>Concurrent Forums</td>
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<tr>
<td></td>
<td>A) Adult Cardiac Session</td>
<td>Pacific Ballroom 1</td>
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<td>B) General Thoracic Session</td>
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<td>C) Congenital Heart Disease Session</td>
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<tr>
<td>8:30 am – 9:50 am</td>
<td>Scientific Session V</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>9:50 am – 10:10 am</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Pacific Ballroom 2-3</td>
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<tr>
<td>10:10 am – 11:10 am</td>
<td>Scientific Session VI</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>11:10 am – 12:00 pm</td>
<td>C. Walton Lillehei Point/Counterpoint Session</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>12:00 pm – 12:30 pm</td>
<td>Annual Business Meeting (Members Only)</td>
<td>Pacific Ballroom 1</td>
</tr>
<tr>
<td>12:30 pm – 2:00 pm</td>
<td>Family Luncheon</td>
<td>Pacific Lawn</td>
</tr>
<tr>
<td>7:00 pm – 11:00 pm</td>
<td>President’s Reception &amp; Banquet</td>
<td>Pacific Ballroom</td>
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**DRESS CODE**

Except for the President’s Reception and Banquet, the dress code for the Annual Meeting is Resort Casual; jacket and ties are not required. The President’s Reception and Banquet is black tie preferred, with dark suits acceptable.
## SCHEDULE OF EVENTS
For Registered Spouses, Registered Guests, and Registered Children

### WEDNESDAY, June 25, 2014

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>1:00 pm – 6:00 pm</td>
<td>Registration</td>
<td>Pacific Ballroom Promenade</td>
</tr>
<tr>
<td>7:00 pm – 9:00 pm</td>
<td>New Members/Welcome Reception</td>
<td>Sunset Terrace</td>
</tr>
<tr>
<td>7:00 pm – 9:00 pm</td>
<td>Kids &amp; Teens Reception (Ages 5-18)</td>
<td>Mediterranean Room &amp; Terrace</td>
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### THURSDAY, June 26, 2014

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>6:00 am</td>
<td>Samson Fun Run</td>
<td>Start Line: Hotel Group Entrance</td>
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<tr>
<td>7:00 am – 1:30 pm</td>
<td>Registration</td>
<td>Pacific Ballroom Promenade</td>
</tr>
<tr>
<td>7:00 am – 11:00 am</td>
<td>Family Hospitality</td>
<td>Mediterranean Room &amp; Terrace</td>
</tr>
<tr>
<td>9:00 am – 9:05 am</td>
<td>On the 40th Anniversary of the WTSA</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>9:05 am – 9:10 am</td>
<td>New Member &amp; Samson Prize Finalist Introductions</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>9:10 am – 9:55 am</td>
<td>Presidential Address</td>
<td>Pacific Ballroom 1</td>
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<tr>
<td>11:40 am – 11:45 am</td>
<td>David J. Dugan Distinguished Service Award Presentation</td>
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*Separate Subscription Required*
# FRIDAY, June 27, 2014

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<tr>
<td>1:20 pm</td>
<td>Golf Tournament*</td>
<td>Monarch Beach Golf Links</td>
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<tr>
<td>2:00 pm</td>
<td>Tennis Tournament*</td>
<td>The Tennis Club</td>
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<td>Free Evening</td>
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# SATURDAY, June 28, 2014

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<tr>
<th>Time</th>
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<tr>
<td>6:30 am – 12:00 pm</td>
<td>Registration</td>
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<tr>
<td>7:00 am – 11:00 am</td>
<td>Family Hospitality</td>
<td>Mediterranean Room &amp; Terrace</td>
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<tr>
<td>12:30 pm – 2:00 pm</td>
<td>Family Luncheon</td>
<td>Pacific Lawn</td>
</tr>
<tr>
<td>7:00 pm – 10:00 pm</td>
<td>Kids &amp; Teens Banquet (Ages 5-18)</td>
<td>Mediterranean Room &amp; Terrace</td>
</tr>
<tr>
<td>7:00 pm – 11:00 pm</td>
<td>President’s Reception &amp; Banquet</td>
<td>Pacific Ballroom</td>
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<td>Black Tie Preferred</td>
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</table>

**DRESS CODE**

Except for the President’s Reception and Banquet, the dress code for the Annual Meeting is Resort Casual; jacket and ties are not required. The President’s Reception and Banquet is black tie preferred, with dark suits acceptable.

*Separate Subscription Required*
ACCREDITATION

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American Association for Thoracic Surgery (AATS) and the Western Thoracic Surgical Association (WTSA). The American Association for Thoracic Surgery is accredited by the ACCME to provide continuing medical education for physicians.

The American Association for Thoracic Surgery designates this live activity for a maximum of 12.75 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

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 annual meeting 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/surgeons 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.

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.

The program begins with a half-day scientific plenary session of original papers and the Presidential Address by Thomas A. Burdon, and concludes with a combined Invited Guest Speaker and Spouse Forum Session on Making Yourself Just a Little Happier.

The Friday scientific program features: plenary sessions of original papers; a Postgraduate Course, sponsored by an educational grant from the White Memorial Medical Center and Foundation Lyman A. Brewer, III, Fund and a donation from Thomas J. Fogarty; and a session on Catheter-Based Mitral Valve Replacement: What Is It and Is It Possible?
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; invited speakers providing an Update on Pediatric VADs and Simulations in Cardiac Surgery; and the highly successful C. Walton Lillehei Point/Counter-Point Session, with this year’s debate examining Pay-for Performance vs. Criteria-Based Systems in the US and Canada.

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 Point/Counterpoint session, the Breakfast session, the Postgraduate Course, and the Concurrent Forums on Adult Cardiac, General Thoracic and Congenital Heart Disease, 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.

**LEARNING OBJECTIVES**

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

- Discuss current investigations and novel approaches in the management of adult cardiac, general thoracic and congenital heart disease patients suffering from an array of surgical conditions relating to the heart, lungs, organs of the thorax, and other airway/circulation diseases;

- Discuss current basic science investigations relating to advances in the treatment and management of cardiothoracic and/or congenital heart disease patients and conditions;

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

It is the policy of the American Association for Thoracic Surgery (AATS) that any individual who is in a position to control or influence the content of an educational activity to disclose all relevant financial relationships or affiliations. All identified conflicts of interest must be resolved and the educational content thoroughly vetted by the AATS for fair balance, scientific objectivity, and appropriateness of patient care recommendations. In addition, faculty members are asked to disclose when any discussion of unapproved use of pharmaceutical or medical device occurs.

For further information on the Accreditation Council for Continuing Medical Education (ACCME) Standards of Commercial Support, please visit www.accme.org.
GENERAL INFORMATION

REGISTRATION
The Registration Desk will be open in the Pacific Ballroom Promenade during the following hours:

- Wednesday, June 25: 1:00 pm – 6:00 pm
- Thursday, June 26: 7:00 am – 1:30 pm
- Friday, June 27: 7:00 am – 12:00 pm
- Saturday, June 28: 6:30 am – 12:00 pm

SPEAKER READY ROOM
The Speaker Ready Room will be located in Sorrento. 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, June 25th). All presentations must be submitted in PowerPoint format only.

EXHIBITS
Commercial Exhibits are located in Pacific Ballroom 2-3 and open during the following hours:

- Thursday, June 26: 7:00 am – 12:00 pm
- Friday, June 27: 7:00 am – 12:00 pm
- Saturday, June 28: 6:30 am – 10:30 am

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

- Thursday, June 26: 7:00 am – 8:00 am
- Friday, June 27: 7:00 am – 8:00 am
- Saturday, June 28: 6:30 am – 7:30 am

Coffee and other beverages will be available during scheduled breaks.
HOSPITALITY SUITE
A hospitality suite is available in the Mediterranean Room and Terrace for all registered spouses, registered guests, and registered children during the following hours:

- Thursday, June 26: 7:00 am – 11:00 am
- Friday, June 27: 7:00 am – 11:00 am
- Saturday, June 28: 7:00 am – 11:00 am

Breakfast is available from 7:00 am to 10:00 am each day; coffee and other beverages are available during all hospitality hours:

- 7:00 am – 8:00 am: Continental Breakfast Served
- 8:00 am – 10:00 am: Full Breakfast Served
- 10:00 am – 11:00 am: Snacks & Beverages Served

BADGE IDENTIFICATION
- Member and Spouse: Cream
- Guest Physician and Spouse: Blue
- Allied Personnel: Green
- Exhibitor: Orange

INCLUDED IN THE REGISTRATION FEE
Included in the registration fee are the New Members/Welcome Reception on Wednesday evening, the Thursday morning Samson Fun Run, the So-Cal Vintage Beach Party Theme Dinner on Thursday evening, the Saturday Family Luncheon, the President’s Reception and Banquet on Saturday evening, and daily breakfasts (served in the Exhibit Hall for registered professional attendees and in the Hospitality Suite for registered spouses, registered guests, and registered children). Supervised Kids & Teens Receptions, for ages 5–18, will provide dynamic, entertaining, and safe programs during Wednesday’s New Members/Welcome Reception and Saturday’s President’s Banquet. Please remember that individual tickets for events are not offered; full registration is required.
NEW MEMBERS/WELCOME RECEPTION

Wednesday, June 25
7:00 pm – 9:00 pm

Join the WTSA in welcoming its new members on the Sunset Terrace.

Registered children ages 5–18 are invited to their own Kids & Teens Welcome Reception, to be held concurrently in the Mediterranean Room and Terrace. 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 5K Fun Run will begin at the Hotel Group Entrance. All participants will receive an official Samson Fun Run T-shirt at the finish line. Prizes will be presented at the Saturday Luncheon.

SO-CAL VINTAGE BEACH PARTY THEME DINNER

Thursday, June 26
6:00 pm – 10:00 pm

The Thursday night Theme Dinner will be held on the stunning Grandlawn North, with its views of the golf course and pool. Come “Hang 10” and channel your inner Frankie and Annette! All meeting registrants are welcome to attend; individual tickets are not offered.

FAMILY LUNCHEON

Saturday, June 28
12:30 pm – 2:00 pm

Join registered physicians, spouses, guests, and family members for this outdoor luncheon on the Pacific Lawn 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 28 7:00 pm – 11:00 pm

The 40th Annual Meeting will conclude with the Presidential Reception and Banquet in the Pacific Ballroom. You won’t want to miss the J.R. Lewis Band, which will keep the room dancing for hours! Attire is black tie preferred, with dark suits acceptable.

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

(Separate Subscription Required)

GOLF TOURNAMENT
Monarch Beach Golf Links, The St. Regis Monarch Beach

Friday, June 27 1:20 pm

This year’s golf tournament will take place on the Monarch Beach Golf Links Course. Designer Robert Trent Jones, Jr., modeled this Dana Point golf course after the Scottish links style course, strategically crafting the Monarch Beach course along the Pacific Ocean. The 6,600 yard course, which opened in 1983, features rolling greens and tight fairways that provide a challenge for golfers of any skill level.

In 2010, Golf Magazine named it one of the premier golf resorts in the area. This Orange County golf course was ranked No. 17 on the Top 20 U.S. Golf Courses, Readers’ Choice by Celebrated Living in 2009, and No. 3 on Orange County’s 18 Can’t Miss Golf Holes in 2008 by Orange Coast Magazine. The Monarch Beach Golf Links also features one of the Top 100 Golf Shops, according to Golf World Magazine.

Pre-registration is required with indication of handicap.

$285 per person includes greens fees, forecaddie, cart, shotgun start, box lunch, and prizes. [Golf clubs (rental available through pro shop—advance notification required) and golf balls are not included.]

TEENNIS TOURNAMENT
The Tennis Club, The St. Regis Monarch Beach

Friday, June 27 2:00 pm

Delight in the eight-court complex of The St. Regis Monarch Beach. Located adjacent to the Golf Course Pro Shop, the facility features hard tennis courts.

Pre-registration is required with indication of level of play.

$100 per person includes court fees, tennis balls, sports snacks and beverages, and prizes. [Racquet (rental available through pro shop—advance notification required) and shoes are not included.]
CHILD CARE SERVICES

The St. Regis offers the Sandcastle Kid’s Club. Active, professional Kid’s Club attendants will ensure that your children will enjoy arts and crafts, a variety of board games, Nintendo Wii, various children’s movies, sand art, air hockey, and beach and pool activities. To make reservations or for further information, contact the Concierge team via telephone at 949-234-3271 (from 6:30 am to 10:30 pm) or email at 01361-concierge@stregis.com.

BABYSITTING SERVICES

If your child is under the age of 5 and too young to participate in the Sandcastle Kids Club, Kid’s Night Out, or our other children’s activities, the concierge team would be delighted to connect you with a trusted child care provider. Enjoy a wonderful parents’ night out knowing your child is attended for in the best care. To schedule a babysitter while in residence at The St. Regis Monarch Beach, please contact the Concierge desk directly at 949-234-3271.

*The St. Regis also offers additional activities such as Father/Son Tee Time, Summer Children’s Stories, S’mores and more. Please contact the concierge desk for more information on activities that are available.*
DOLPHIN & WHALE WATCHING SAFARI
Leaves from the St. Regis Monarch Beach Group Entrance
Thursday, June 26 1:30 pm
Registration Required

Cost: $100.00

Itinerary and Highlights:
You will experience an unforgettable 2 1/2 hour tour at sea aboard a hi-tech catamaran. This incredibly stable vessel affords guests an up-close and personal look at some of the ocean’s most beautiful and playful creatures. Soda, water, beer, wine coolers, and dry snacks will be provided (lunch will be on your own prior to the tour).

Includes: Transportation, snacks, and beverages

Does Not Include: Lunch

PADDLE BOARDING EXCURSION
Leaves from the St. Regis Monarch Beach Group Entrance
Thursday, June 26 1:30 pm
Registration Required

Cost: $105.00
*Only open to children 10 years of age and older

Itinerary and Highlights:
During this tour you will start with a lesson on the beach, learning all the basics of stand-up paddle and ocean safety. After launching, you will paddle out of the cove to practice turning and maneuvering. Once everyone is comfortable, you will then paddle to Seal Rock to witness California Sea Lions and hopefully dolphins and other wildlife! (Lunch will be on your own prior to the tour.)

Includes: Transportation, paddleboard and gear, and lesson

Does Not Include: Lunch

Skill Level: Beginner
ACKNOWLEDGMENTS
The Western Thoracic Surgical Association wishes to thank the following companies and organizations for their educational and marketing support of the 40th Annual Meeting:

EDUCATIONAL GRANTS (Confirmed through June 10, 2014)

Medtronic, Inc., for their support as a Silver Level Sponsor
St. Jude Medical for their support of the Lillehei Point/Counterpoint
Baxter Healthcare for their support as a corporate sponsor
White Memorial Medical Center and Foundation, Lyman A. Brewer, III Fund for their support of the Postgraduate Course

MARKETING SUPPORT (Confirmed through June 10, 2014)

Ethicon Endo-Surgery

EXHIBIT SUPPORT (Confirmed through June 10, 2014)

ABIOMED, Inc.
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ATMOS, Inc.
AtriCure, Inc.
Baxter Healthcare
Biomet Microfixation
CorMatrix Cardiovascular, Inc.
Covidien
CryoLife, Inc.
CSA Medical, Inc.
Davol Inc., A Bard Company
Edwards Lifesciences
ETHICON
Genesee Biomedical, Inc.
Gore & Associates
Grifols, Inc.
Heartware, Inc.
KLS Martin, LP
LifeNet Health
LSI Solutions
MAQUET Medical Systems, USA
Medtronic, Inc.
MedXpert North America, LLC
Myriad Genetic Laboratories, Inc.
On-X Life Technologies, Inc.
rEVO Biologics
RTI Surgical, Inc.
Scanlan International, Inc.
Sorin Group
St. Jude Medical
Terumo Cardiovascular Systems
Thoracic Surgery Foundation for Research and Education
Thoratec Corporation
Vitalitec
Vitalcor, Inc.
Wexler Surgical
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 Sorrento, 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 25th). All presentations must be submitted in PowerPoint format only. 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 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.
# PROGRAM OUTLINE

## WEDNESDAY, JUNE 25, 2014

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>1:00 pm – 6:00 pm</td>
<td>REGISTRATION, Pacific Ballroom Promenade</td>
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<tr>
<td>1:00 pm – 6:00 pm</td>
<td>SPEAKER READY ROOM, Sorrento</td>
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<tr>
<td>7:00 pm – 9:00 pm</td>
<td>NEW MEMBERS/WELCOME RECEPTION, Sunset Terrace</td>
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## THURSDAY, JUNE 26, 2014

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>6:00 am</td>
<td>SAMSON FUN RUN, Hotel Group Entrance</td>
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<tr>
<td>7:00 am – 1:30 pm</td>
<td>REGISTRATION, Pacific Ballroom Promenade</td>
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<tr>
<td>7:00 am – 8:00 am</td>
<td>BREAKFAST, Pacific Ballroom 2-3</td>
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<td>7:00 am – 12:00 pm</td>
<td>EXHIBITS, Pacific Ballroom 2-3</td>
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<tr>
<td>7:00 am – 12:30 pm</td>
<td>SPEAKER READY ROOM, Sorrento</td>
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<tr>
<td>8:00 am – 9:00 am</td>
<td>SCIENTIFIC SESSION I</td>
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<td>Pacific Ballroom 1</td>
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<td></td>
<td>(10 minutes presentation, 10 minutes discussion)</td>
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<td></td>
<td>Moderators: Michael S. Mulligan, Thomas A. Burdon</td>
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<tr>
<td></td>
<td>1. Ascending TEVAR in High Risk Patients</td>
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<td></td>
<td>Eric E. Roselli, Jahanzaib Idrees, Charles Wojnarski,</td>
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<td>Douglas R. Johnston</td>
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<td>Cleveland Clinic, Cleveland, OH</td>
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<td></td>
<td>DISCUSSANT: D. CRAIG MILLER</td>
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</tbody>
</table>
+2. Preoperative Gene Expression Predicts Neurocognitive Decline After Cardiopulmonary Bypass
Ashraf A. Sabe\textsuperscript{1}, Rahul S. Dalal\textsuperscript{1}, Louis M. Chu\textsuperscript{1}, Nassrene Y. Elmadhun\textsuperscript{1}, Basel Ramlawi\textsuperscript{2}, Cesario Bianchi\textsuperscript{1}, Frank W. Sellke\textsuperscript{1}
\textsuperscript{1}Warren Alpert Medical School of Brown University, Providence, RI, Providence, RI; \textsuperscript{2}The Methodist Hospital, Houston, TX

DISCUSSANT: CHUONG D. HOANG

+3. Patient-Oriented, Collaborative Approach for the Surgical Treatment of Adult Congenital Heart Disease
Aaron H. Healy\textsuperscript{1}, Peter J. Gruber\textsuperscript{2}, *John R. Doty\textsuperscript{3}, *Phillip T. Burch\textsuperscript{2}, Aaron W. Eckhauser\textsuperscript{2}, *William T. Caine\textsuperscript{3}, Amit N. Patel\textsuperscript{1}, Stephen E. Clayson\textsuperscript{3}, *Stephen H. McKellar\textsuperscript{1}, Bruce B. Reid\textsuperscript{3}, Ganesh S. Kumpati\textsuperscript{1}, *Kent W. Jones\textsuperscript{3}, *David A. Bull\textsuperscript{1}, Linda M. Lambert\textsuperscript{2}, *Craig H. Selzman\textsuperscript{1}
\textsuperscript{1}University of Utah, Salt Lake City, UT; \textsuperscript{2}Primary Children’s Hospital, Salt Lake City, UT; \textsuperscript{3}Intermountain Medical Center, Murray, UT

DISCUSSANT: JOHN J. LAMBERTI

9:00 am – 9:05 am
On the 40th Anniversary of the WTSA\textsuperscript{*}, Pacific Ballroom 1

Marvin Pomerantz

9:05 am – 9:10 am
NEW MEMBER & SAMSON PRIZE FINALIST INTRODUCTIONS\textsuperscript{*}, Pacific Ballroom 1
9:10 am – 9:55 am  **PRESIDENTIAL ADDRESS**

*Pacific Ballroom 1*

Introduced By: Michael S. Mulligan

**Witness to the Wonder Years: Innovation to Transformation**

Thomas A. Burdon

9:55 am – 10:20 am  **COFFEE BREAK, VISIT EXHIBITS & POSTERS**,  

*Pacific Ballroom 2-3*

10:20 am – 11:40 am  **SCIENTIFIC SESSION II**

*Pacific Ballroom 1*

(10 minutes presentation, 10 minutes discussion)

Moderator: Jessica Donington

4. **Long-Term Quantitative Analysis of Change in Mitral Regurgitation Following Aortic Valve Replacement: A Case for Aggressive Mitral Intervention**

Jeffrey E. Cohen¹, John W. MacArthur¹, Jessica L. Howard², Robert J. Emery², Emily C. VanderMeer², Mary A. Sheridan², Alexandra L. Acker², Andrew B. Goldstone², Christopher M. Brusalis², Alexander S. Fairman², Jay B. Patel¹, Alen Trubelja², George Hung², Bryan B. Edwards¹, William Hiesinger², Pavan Atluri², Y. Joseph Woo¹

¹Stanford University, Palo Alto, CA; ²University of Pennsylvania, Philadelphia, PA

**DISCUSSANT: NICHOLAS G. SMEDIRA**

5. **Resection of Thymoma Should Include Nodal Sampling**

Benny Weksler¹, Arjun Pennathur², Katie Nason²

¹University of Tennessee Health Science Center, Memphis, TN; ²University of Pittsburgh Medical Center, Pittsburgh, PA

**DISCUSSANT: SEAN C. GRONDIN**
6. **Pre-Operative Three Dimensional (3-D) Lung Segmental Reconstruction Prior to Anatomic Segmentectomy or Lobectomy for Stage I Non-Small Cell Lung Cancer (NSCLC)**
Matthew J. Schuchert, Ernest Chan, James R. Landreneau, Suicheng Gu, Jiantao Pu, David D. Odell, Kristen N. McCormick, Arjun Pennathur, David O. Wilson, James D. Luketich, Rodney J. Landreneau

1Department of Cardiothoracic Surgery; University of Pittsburgh Medical Center, Pittsburgh, PA; 2Louisiana State University School of Medicine, New Orleans, LA; 3Department of Radiology; University of Pittsburgh Medical Center, Pittsburgh, PA

DISCUSSANT: LEAH M. BACKHUS

+7. **Extended Cardiac and Great Vessel Resection for Mediastinal Sarcomas: A 15-Year Single-Institution Experience**

New York Presbyterian Hospital – Weill Cornell Medical Center, New York, NY

DISCUSSANT: ROBERT B. CAMERON

11:40 am – 11:45 am **DAVID J. DUGAN DISTINGUISHED SERVICE AWARD PRESENTATION**

Conferred posthumously to Harold C. Urschel, Jr., Dallas, Texas, by David A. Fullerton

+ Samson Resident Prize Essay
* Not for Credit
<table>
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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>11:45 am – 12:30 pm</td>
<td><strong>INVITED GUEST SPEAKER &amp; SPOUSE FORUM SESSION</strong></td>
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<tr>
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<td>Pacific Ballroom 1</td>
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<td>Making Yourself Just a Little Happier</td>
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<td>Frédéric Luskin</td>
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<td>12:30 pm</td>
<td>ADJOURN</td>
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<td>1:30 pm</td>
<td><strong>PADDLE BOARDING EXCURSION</strong>, Depart from Hotel Group Entrance</td>
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<td>1:30 pm</td>
<td><strong>DOLPHIN &amp; WHALE WATCHING SAFARI</strong>, Depart from Hotel Group Entrance</td>
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<tr>
<td>6:00 pm – 10:00 pm</td>
<td><strong>SO-CAL VINTAGE BEACH PARTY THEME DINNER</strong>, Grandlawn North</td>
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** Separate Subscription Required
FRIDAY, JUNE 27, 2014

7:00 am – 12:00 pm  REGISTRATION, Pacific Ballroom Promenade
7:00 am – 8:00 am  BREAKFAST, Pacific Ballroom 2-3
7:00 am – 12:00 pm  EXHIBITS, Pacific Ballroom 2-3
7:00 am – 12:00 pm  SPEAKER READY ROOM, Sorrento

7:30 am – 9:10 am  SCIENTIFIC SESSION III

Pacific Ballroom 1
(10 minutes presentation, 10 minutes discussion)

Moderators: Susan D. Moffatt-Bruce
Patricia A. Thistlethwaite

+8. Sporadic Ascending Aorta Aneurysm: Is it the Diameter of Ascending Aorta a Good Criteria for Surgical Indication?
Calogera Pisano, Carmela Rita Balistreri, Oreste Fabio Triolo, Daniele Merlo, Vincenzo Argano, Cesira Palmeri, Giovanni Ruvolo
Unit of Cardiac Surgery, Department of Surgery and Oncology, University of Palermo, Palermo, Italy
DISCUSSANT: T. BRETT REECE

9. Myocardial Cytochrome Oxidase Activity Increases with Age and Hypoxemia in Patients with Congenital Heart Disease – A Basis for Ischemia-Reperfusion Injury
Michael Onwugbufo1, Richard Levy1, David Zurakowski2, Pranava Sinha1
1Children’s National Medical Center, Washington, DC;
2Children’s Hospital Boston, Boston, MA
DISCUSSANT: JOSEPH WOO

+ Samson Resident Prize Essay
10. **Shorter Length of Stay Is Associated with Increased Readmission Rates Following Esophagectomy**  
   **Brian C. Gulack**, Brian R. Englum, James M. Meza, Amber R. Wilk, Mark F. Berry  
   *Duke University Medical Center, Durham, NC*  
   **Discussant: Jules Lin**

11. **Continuous-Flow Ventricular Assist Device Exchange: A Single-Center Experience**  
   *1Baylor College of Medicine, Houston, TX; 2Texas Heart Institute, Houston, TX*  
   **Discussant: Nahush A. Mokadam**

12. **Extra-Corporeal Membrane Oxygenation (ECMO) As a Bridge to Lung Re-Transplantation in the United States: Is There a Role?**  
   *1University of Pittsburgh Medical Center, Pittsburgh, PA; 2Johns Hopkins School of Public Health, Baltimore, MD; 3Johns Hopkins School of Medicine, Baltimore, MD*  
   **Discussant: Jasleen Kukreja**

**Samson Resident Prize Essay**  
*WTSA Member*
9:10 am – 10:00 am  **POSTGRADUATE COURSE**

Pacific Ballroom 1

Sponsored by: White Memorial Medical Center and Foundation’s – Lyman A. Brewer, III, Fund, and Thomas J. Fogarty

**From Checklists to Culture, What Spacewalking Brings to Surgery**

The Aerospace Sector effectively demonstrates the benefits of high reliability organizations and the tremendous success that follows linking culture to safety, quality and performance. This talk will explore the principles of leadership in high reliability organizations and the applicability of these principles to the zero-fault-tolerant environment of spacewalking and surgery. Participants will learn the key elements of leadership and peak team performance and how these can be implemented in surgical practice.

David Williams, MD
President and CEO
Southlake Regional Health Centre, Ontario, Canada

10:00 am – 10:30 am  **COFFEE BREAK, VISIT EXHIBITS & POSTERS,**

Pacific Ballroom 2-3
10:30 am – 11:30 am  SCIENTIFIC SESSION IV

Pacific Ballroom 1
(10 minutes presentation, 10 minutes discussion)

Moderators: John C. Chen
             Richard I. Whyte

+13. Spinal Cord Protection via Alpha-2 Agonist Mediated Increase in Glial Cell Derived Neurotrophic Factor
    **University of Colorado Denver, Aurora, CO**
    DISCUSSANT: JOHN IKONIMIDIS

14. Failure-to-Rescue and Pulmonary Resection for Lung Cancer
    **Farhood Farjah¹**, *Leah M. Backhus¹*,
    Aaron M. Cheng¹, Brian Englum², Sunghee Kim², Paramita Saha-Chaudhuri², *Douglas E. Wood³, *Michael S. Mulligan¹, *Thomas K. Varghese¹
    ¹University of Washington, Seattle, WA; ²Duke University, Durham, NC
    DISCUSSANT: ROBERT J. CERFOLIO

15. Introducing Transaortic Valve Implantation: Effect of the Learning Curve on Clinical Outcome – A Single Centre Experience
    **Davide Gabbari¹**, Paolo R. Cimato¹, Italo Ghidoni¹, Guglielmo Stefanelli¹, Giuseppe D’Anniballe², Alberto Benassi², Clorinda Labia², Polo Pisi³, Gianbeppe Giordano⁴, Tiziana Paglia⁴, Marco Meli⁴
    ¹Department of Cardiovascular Surgery, Hesperia Hospital, Modena, Italy; ²Department of Cardiology, Hesperia Hospital, Modena, Italy; ³Department of Radiology, Hesperia Hospital, Modena, Italy; ⁴Department of Anesthesiology, Hesperia Hospital, Modena, Italy
    DISCUSSANT: ALFREDO TRENTO

+ Samson Resident Prize Essay
* WTSA Member
11:30 am – 12:30 pm  CATHETER-BASED MITRAL VALVE REPLACEMENT: WHAT IS IT AND IS IT POSSIBLE?
Moderator:  Michael P. Fischbein
Speakers:  Anson Cheung
           Saibal Kar

12:30 pm  ADJOURN

1:20 pm  GOLF TOURNAMENT**, Monarch Beach Golf Links

2:00 pm  TENNIS TOURNAMENT**, The Tennis Club

FREE EVENING

** Separate Subscription Required
SATURDAY, JUNE 28, 2014

6:30 am – 12:00 pm  REGISTRATION, Pacific Ballroom Promenade
6:30 am – 7:30 am  BREAKFAST, Pacific Ballroom 2-3
6:30 am – 10:30 am  EXHIBITS, Pacific Ballroom 2-3
6:30 am – 11:30 am  SPEAKER READY ROOM, Sorrento
7:00 am – 8:15 am  CONCURRENT FORUMS
(5 minutes presentation, 3 minutes discussion)

ADULT CARDIAC

Pacific Ballroom 1

Moderators: Anthony D. Caffarelli
             Frederick A. Tibayan

CF1. Right Mini-Thoracotomy Versus Sternotomy Approach to Mitral Valve: A Propensity Matched Study
Paul Tang, Mark Onaitis, Bhargavi Desai, Jeffrey G. Gaca, Carmelo A. Milano, Mark Stafford-Smith, Donald Glower
Duke University Medical Center, Durham, NC

CF2. Sutureless Valve Implantation Via Mini J-Sternotomy: 113 Patients with 2 Years Follow Up
Steffen Pfeiffer, Giuseppe Santarpino, Ferdinand Vogt, Francesco Pollari, Joachim Sirch, Theodor J. Fischlein
Klinikum Nürnberg, Nürnberg, Germany
CF3. Training Junior Faculty Improves Reliability of Skills Assessment in Cardiac Surgery
Xiaoying Lou\textsuperscript{1}, Richard Lee\textsuperscript{2}, Richard Feins\textsuperscript{3}, Daniel Enter\textsuperscript{1}, George Hicks\textsuperscript{4}, \*Edward Verrier\textsuperscript{5}, \*James Fann\textsuperscript{6}
\textsuperscript{1}Northwestern University, Chicago, IL; \textsuperscript{2}St. Louis University, St. Louis, MO; \textsuperscript{3}University of North Carolina at Chapel Hill, Chapel Hill, NC; \textsuperscript{4}University of Rochester Medical Center, Rochester, NY; \textsuperscript{5}University of Washington Medical Center, Seattle, WA; \textsuperscript{6}Stanford University, Palo Alto, CA

CF4. Erythropoietin Activates pCREB Pathway and Attenuates Delayed Paraplegia Following Ischemia Reperfusion Injury
Joshua M. Mares, Lisa S. Foley, Marshall T. Bell, Daine T. Bennett, Kirsten A Freeman, Xianzhong Meng, \*Michael J. Weyant, \*Joseph C. Cleveland, Jr., \*David A. Fullerton, Ferenc Puskas, \*T. Brett Reece
University of Colorado, Aurora, CO

CF5. One-Year Results of Rescue Trial: TEVAR for Traumatic Aortic Injury Remains a Favorable Therapeutic Approach at Mid-Term Follow-Up?
Ali Khoynezhad\textsuperscript{1}, Carlos Donayre\textsuperscript{2}, Ali Azizzadeh\textsuperscript{3}, Rodney White\textsuperscript{2}
\textsuperscript{1}Cedars-Sinai Medical Center, Los Angeles, CA; \textsuperscript{2}Harbor-UCLA Medical Center, Torrance, CA; \textsuperscript{3}Herman Memorial Hospital, Houston, TX

CF6. Determinants of Variation in Cost-Effectiveness of TAVR in Inoperable Patients
Nimesh Desai, Kelly Sutter, Lisa Walsh, Robert Stetson, Saif Anwaruddin, Jay Giri, Prashanth Vallabhajosyula, Rohan Menon, Robert Li, Wilson Szeto, Howard Herrmann, Joseph Bavaria
University of Pennsylvania, Philadelphia, PA

\* WTSA Member
CF7. **Effect of Patient Age on Blood Product Transfusion Following Cardiac Surgery**  
*Niv Ad, Eric Sarin, Alan M. Speir, Linda Halpin, Graciela Pritchard, Linda Henry, Sari D. Holmes*  
*Inova Heart and Vascular Institute, Falls Church, VA*

CF8. **Recombinant Activated Factor VII (rFVIIa) Use in Patients Undergoing Ventricular Assist Device Placement**  
*Oregon Health and Science University, Portland, OR*

**GENERAL THORACIC**

Adriatic  
**Moderators:** Steven R. DeMeester  
Thomas K. Varghese

CF9. **Donor Characteristics Influence Survival After Lung Transplantation**  
*Peter Chiu, Justin M. Schaffer, Ahmad Y. Sheikh, *Bruce A. Reitz, Y. Joseph Woo, Richard Ha*  
*Stanford University Medical Center, Stanford, CA*

CF10. **CTEN Expression Mediates Invasion of Human Lung Adenocarcinoma Cells and is Regulated by STAT3**  
*University of Colorado Denver, Anschutz Medical Campus, Aurora, CO*

CF11. **Clinically Staged N0-1 Esophageal Adenocarcinoma: Actual Pathologic Lymph Node Status and Survival After Primary Esophagectomy**  
*Stephanie G. Worrell, *Steven R. DeMeester, Christina L. Greene, Daniel S. Oh, Jeffrey A. Hagen*  
*University of Southern California, Los Angeles, CA*

* WTSA Member
Mayo Clinic Hospital, Phoenix, AZ

CF13. Obesity Elevated Adipokine Production Is Associated with More Aggressive Esophageal Adenocarcinoma Tumor Growth Rates In Vivo
Aaron J. Fowler, Amanda L. Richer, Alexandra V. Soto, *Ross M. Bremner, Landon J. Inge
Heart and Lung Institute, St. Joseph’s Hospital and Medical Center, Phoenix, AZ

CF14. Preoperative Plasma Osteopontin Predicts Three Year Recurrence and Five Year Survival in Resected Stage I Adenocarcinoma of the Lung
*Jessica S. Donington, Nathalie Hirsch, Joseph Levin, Yvonne Owusu-Sarpong, Ryan Harrington, Brady Kwong, Kirill Prokrym, Bernard Crawford, Michael Zervos, Costas Bizekis, Harvey Pass
NYU School of Medicine, New York, NY

CF15. Risk Stratification of Prognostic Variables in Patients Undergoing Lung Metastectomy for Soft Tissue and Bone Sarcomas
University of California, Los Angeles, Los Angeles, CA

CF16. The Impact of Surgeon Experience on Outcomes After Resection for Stage I Lung Cancer
Paul Scheel, Traves D. Crabtree, Jennifer M. Bell, Daniel Kreisel, A. Sasha Krupnick, Stephen Broderick, G. Alexander Patterson, Bryan F. Meyers, Varun Puri
Washington University School of Medicine, Saint Louis, MO

* WTSA Member
CONGENITAL HEART DISEASE

Aegean

Moderators: Tara B. Karamlou
David M. McMullan

CF17. Altered Myocyte Contractility in Alpha-Myosin Heavy Chain Point Mutations Linked to Familial Dilated Cardiomyopathy
Matthew Klos, *Eric Devaney
UCSD Rady Children’s Hospital, San Diego, CA

CF18. Contemporaneous Comparison of the Yasui and Norwood Procedures at a Single Institution
Stanford University School of Medicine, Stanford, CA

CF19. Selective Use of Blalock-Taussig Shunt and Sano Conduit During the Norwood Procedure
Vinod A. Sebastian, Raghav Murthy, Andrea Cooley, Rong Huang, Kristine J. Guleserian, Joseph M. Forbess
UT Southwestern Medical Center at Dallas, Dallas, TX

CF20. Pediatric Heart Valve Replacement with Extremely Small Prostheses
Seattle Children’s Hospital, Seattle, WA

CF21. The 19 Year Evolution of a Pediatric Open Heart Surgery Program in Hawaii; Methodology, Program Results and Lessons Learned
Daniel J. DiBardino¹, James Y. Sim², Carlos E. Moreno², John W. Moore¹, *John J. Lamberti¹
¹University of California San Diego, San Diego, CA; ²University of Hawaii, Honolulu, HI

* WTSA Member
CF22. Results of Palliation with an Initial Pulmonary Artery Band in Patients with Single Ventricle Associated with Excessive Pulmonary Blood Flow
*Bahaaldin Alsoufi, Brian Kogon, Alexandra Ehrlich, Kevin Maher, Matthew Oster, William Mahle, Kirk Kanter
Emory University School of Medicine, Atlanta, GA

CF23. Aortic Root Translocation: Late Follow-Up and Impact of Valved Versus Non-valved RV-PA Conduit
Vijayakumar Raju, Patrick O Myers, Luis G. Quinonez, Sitaram M. Emani, John E. Mayer, Frank A. Pigula, Pedro J. Del Nido, Christopher W. Baird
Boston Children’s Hospital, Boston, MA

CF24. Outcome of Tricuspid Valve Plasty in Norwood Stage One Operation
Shu-chien Huang, Yih-Sharng Chen, Chung-I Chang, Ing-Sh Chiu
National Taiwan University Hospital, Taipei, Taiwan

8:30 am – 9:50 am S C I E N T I F I C S E S S I O N V

Pacific Ballroom 1
Invited Speakers

Update on Pediatric VADs
Jonathan Michael Chen

Simulations in Cardiac Surgery
Craig J. Baker
James I. Fann

* WTSA Member
16. Dual Anti-Platelet Therapy in Patients with Acute Coronary Syndromes Undergoing CABG: A Meta-Analysis of Randomized Trials
Subodh Verma, Muhammad R. Ahsan, David A. Latter, Hwee Teoh, Jan O. Friedrich
St. Michael’s Hospital, Toronto, ON, Canada
D I S C U S S A N T : N I C H O L A S G. S M E D I R A

17. Extended Pleurectomy and Decortication for Malignant Pleural Mesothelioma Is an Effective and Safe Cyto-Reductive Surgery in the Elderly
Trevor Williams, Duraid Hadi, Amy Durkin, Kristy Todd, Cathy Staub, Jennifer Hull, Hedy Kindler, Wickii T. Vigneswaran
University Of Chicago, Chicago, IL
D I S C U S S A N T : B R Y A N B U R T

9:50 am – 10:10 am
C O F F E E B R E A K , V I S I T E X H I B I T S & P O S T E R S ,
Pacific Ballroom 2-3

10:10 am – 11:10 am S C I E N T I F I C S E S S I O N V I
Pacific Ballroom 1
(10 minutes presentation, 10 minutes discussion)
Moderators: Chuong D. Hoang Daniel L. Serna

18. Long-Term Outcomes Following Thoracic Endovascular Aortic Repair (TEVAR), an Analysis of Over 10,000 Medicare TEVAR Recipients
Justin M. Schaffer, Bharathi Lingala, Y. Joseph Woo, Michael D Dake
Stanford Hospitals and Clinics, Stanford, CA
D I S C U S S A N T : R O B B I N G. C O H E N

+ Samson Resident Prize Essay
19. Del Nido Versus Buckberg Cardioplegia in Adult Isolated Valve Surgery
Stephanie L. Mick, Michael Robich, Catherine Torma, Annmarie Fatula, Patrick Grady, A. Marc Gillinov, Edward Soltesz, Douglas R. Johnston, Joseph F. Sabik, III
Cleveland Clinic, Cleveland, OH
DISCUSSANT: RICHARD J. SHEMIN

+20. The Impact of Adjuvant Therapy on Recurrence and Survival Following Primary Esophagectomy for Adenocarcinoma
Stephanie Worrell, *Steven R. DeMeester, Christina L. Greene, Daniel S. Oh, Jeffrey A. Hagen
University of Southern California, Los Angeles, CA
DISCUSSANT: JOSEPH B. SHRAGER

11:10 am – 12:00 pm  C. WALTON LILLEHEI
POINT/COUNTERPOINT SESSION

Pacific Ballroom 1
Pay-For Performance Versus Criteria-Based Systems in the US and Canada
Moderator: David A. Fullerton
USA: Jeffrey B. Rich
Canada: Alan H. Menkis

12:00 pm – 12:30 pm  ANNUAL BUSINESS MEETING (Members Only),
Pacific Ballroom 1

12:30 pm – 2:00 pm  FAMILY LUNCHEON, Pacific Lawn

7:00 pm – 11:00 pm  PRESIDENT’S RECEPTION AND BANQUET,
Pacific Ballroom
Black Tie Preferred

+ Samson Resident Prize Essay
* WTSA Member
# FULL SCIENTIFIC PROGRAM

## WEDNESDAY, JUNE 25, 2014

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<tr>
<th>Time</th>
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<tr>
<td>1:00 pm – 6:00 pm</td>
<td><strong>REGISTRATION</strong>, Pacific Ballroom Promenade</td>
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<tr>
<td>1:00 pm – 6:00 pm</td>
<td><strong>SPEAKER READY ROOM</strong>, Sorrento</td>
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<td>7:00 pm – 9:00 pm</td>
<td><strong>NEW MEMBERS/WELCOME RECEPTION</strong>, Sunset Terrace</td>
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## THURSDAY, JUNE 26, 2014

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<tr>
<td>6:00 am</td>
<td><strong>SAMSON FUN RUN</strong>, Hotel Group Entrance</td>
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<tr>
<td>7:00 am – 1:30 pm</td>
<td><strong>REGISTRATION</strong>, Pacific Ballroom Promenade</td>
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<td>7:00 am – 8:00 am</td>
<td><strong>BREAKFAST</strong>, Pacific Ballroom 2-3</td>
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<td>7:00 am – 12:00 pm</td>
<td><strong>EXHIBITS</strong>, Pacific Ballroom 2-3</td>
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<tr>
<td>7:00 am – 12:30 pm</td>
<td><strong>SPEAKER READY ROOM</strong>, Sorrento</td>
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OBJECTIVES: Standard treatment of ascending aortic pathology is open repair, but some patients are too high risk. Thoracic Endovascular Aortic Repair (TEVAR) of the ascending aorta has been used as an alternative. Objectives were to characterize patients, describe repair methods and assess outcomes.

METHODS: From 2006 to 2013, 20 patients underwent supra-coronary ascending TEVAR for acute type A dissection (n = 9), pseudo-aneurysm (n = 7), chronic dissection with aneurysm (n = 3), and intramural hematoma (n = 1) (Figure). Mean age was 72 ± 10 years and the maximum proximal aortic diameter was 5.6 ± 1 cm.

Stent graft devices were delivered via a transfemoral (n = 10), transapical (n = 7) approach or subclavian artery (n = 2). The proximal landing zone was at sinotubular junction in 13, mid to distal ascending aorta in 2 and surgical graft from previous ascending repair in 5. More than one device was used in 12 patients. Imaging and engineering analysis was performed for all patients.

RESULTS: There were 3 (15.8%) hospital deaths (tamponade in one, bleeding left atrial fistula in another). One patient had partial occlusion of left coronary artery and required open conversion, but died later from multiorgan failure. One additional patient required open conversion for retained delivery system. There were 3 strokes, two myocardial infarctions, two tracheostomies, but there was no new onset renal failure. Mean follow-up was 10 ± 8 months. Four patients developed type I endoleak: one was treated with TEVAR extension and the endoleak resolved, one was treated with additional embolization coils, and a third refused further treatment. In one patient the initial TEVAR was performed as a bridge for ruptured high risk acute type A dissection and was later converted to open repair. Re-operations also included: removal of stent graft due to distal migration, and repair of left ventricular pseudoaneurysm. There were 3 late deaths. Actual survival at 30 days, 1 and 5 years was 90%, 80% and 75% respectively.
CONCLUSIONS: Ascending TEVAR is a feasible alternative to medical therapy for repair of acute and chronic ascending disease in high risk patients. Development of devices dedicated to treat ascending aortic pathology is needed and may improve outcomes.
+2. Preoperative Gene Expression Predicts Neurocognitive Decline After Cardiopulmonary Bypass

Ashraf A. Sabe1, Rahul S. Dalal1, Louis M. Chu1, Nassrene Y. Elmadhun1, Basel Ramlawi2, Cesario Bianchi1, Frank W. Sellke1

1Warren Alpert Medical School of Brown University, Providence, RI, Providence, RI; 2The Methodist Hospital, Houston, TX

DISCUSSANT: CHUONG D. HOANG

OBJECTIVE: Despite advances in surgical technique, neurocognitive decline (NCD) after cardiopulmonary bypass (CPB) remains a common and serious complication. We have previously demonstrated that patients with NCD have unique genetic responses 6 hours after CPB when compared with normal patients (NORM). We used genomic microarray to objectively investigate whether patients with NCD had predictive preoperative gene expression profiles, and how these profiles changed up to four days after surgery.

METHODS: Forty-two cardiac surgery patients underwent neurocognitive assessments preoperatively and four days after surgery. Skeletal muscle was collected only intra-operatively. Whole blood collected pre-CPB, 6 hours post-CPB, and on post-operative day four was hybridized to Affymetrix Gene Chip U133 Plus 2.0 microarrays. Gene expression in patients with NCD was compared with gene expression in the NORM group using JMP Genomics. Only genes that were commonly expressed in the two groups with a false discovery rate of 0.05 and a fold change of > 1.5 were carried forward to pathway analysis using Ingenuity Pathway Analysis. Microarray gene expression was validated by Green real-time polymerase chain reaction and western blotting.

RESULTS: 17 out of 42 patients developed NCD. 54,675 common genes were identified on microarray in each group across all time points. Pre-operatively there were 140 genes that were significantly altered between the NORM and NCD groups (p < 0.05). Pathway analysis demonstrated that preoperatively patients with NCD had an increase in genes associated with inflammation, cell death, and neurologic dysfunction (see Figure). Interestingly, significantly regulated genes between the two groups changed over each time point, and decreased from 140 preoperatively, to 64, six hours after CPB, and 25, four days after surgery. There was no correlation in gene expression between the blood and skeletal muscle.
CONCLUSIONS: Patients who developed NCD post-CPB had increased differences in gene expression before surgery. While significant differences in gene expression also existed post-operatively, these differences gradually decreased over time. Pre-operative gene expression may predispose patients to developing neurologic injury after CPB. Further investigation into these genetic pathways may help predict patient outcome and guide patient selection.
OBJECTIVES: An increasing number of adults with congenital heart disease (ACHD) require surgery. This has prompted investigations as to the ideal setting (adult or pediatric hospital) and optimal surgeon (primary adult or pediatric) for treating these patients. Herein, we report the results of a prospective, voluntary collaboration amongst three hospitals and their surgeons for the surgical management of ACHD.

METHODS: All adult (age 18 years+) congenital heart surgeries performed between February 1, 2010 and October 31, 2013 were retrospectively reviewed. Patients were treated at the center (2 adult hospitals, 1 pediatric hospital) that was most appropriate for a given clinical condition, comorbidities, and patient preference. When deemed appropriate, board certified congenital heart surgeons (CHS) traveled to the adult centers to assist in the operation. Case complexity was evaluated using the Society of Thoracic Surgeons-European Association for Cardiothoracic Surgery (STAT) score. Complication and mortality rates were tracked prospectively.

RESULTS: Of the 163 patients who underwent surgery, 114 (70%) were performed at an adult hospital and 49 (30%) were performed at a pediatric hospital. The average age was 34.6 ± 13.3 years old, with patients at the adult hospitals older than the patients at the pediatric hospital (38.9 ± 13.1 years vs. 24.9 ± 7.3 years, p < 0.001). The mean STAT category for all cases was 1.8 ± 0.8. Cases at the adult hospitals had a lower average STAT category than cases at the pediatric hospital (1.7 ± 0.8 vs. 2.0 ± 0.9, p = 0.024). Congenitally-trained heart surgeons assisted on 21.1% (24/114) of cases at the adult hospitals. There was no difference in STAT category between cases at the adult hospitals that were assisted by a CHS vs. unassisted cases (1.8 ± 0.8 vs. 1.7 ± 0.8, p = 0.181). Only one patient died in the cohort, which occurred at one of
the adult hospitals (1/114 or 0.9% vs. 0/49 or 0%, p = 1.000). The observed mortality rate for all hospitals combined was 0.6 ± 7.8%, compared to a STAT model based expected mortality rate of 2.6 ± 2.1% (p = 0.003).

CONCLUSIONS: The surgical treatment of adult congenital heart disease can be successfully accomplished by a collaborative effort between adult and pediatric hospitals and providers. Although our results might be biased by our unique regional relationship, this multi-institutional strategy – independent of location and surgeon – provides excellent outcomes and fosters a patient-first approach to the treatment of ACHD.
9:00 am – 9:05 am  On the 40th Anniversary of the WTSA, Pacific Ballroom 1
                    Marvin Pomerantz

9:05 am – 9:10 am  NEW MEMBER & SAMSON PRIZE FINALIST INTRODUCTIONS, Pacific Ballroom 1

9:10 am – 9:55 am  PRESIDENTIAL ADDRESS

Pacific Ballroom 1

Introduced By: Michael S. Mulligan

Witness to the Wonder Years: Innovation to Transformation
Thomas A. Burdon

9:55 am – 10:20 am  COFFEE BREAK, VISIT EXHIBITS & POSTERS, Pacific Ballroom 2-3
4. Long-Term Quantitative Analysis of Change in Mitral Regurgitation Following Aortic Valve Replacement: A Case for Aggressive Mitral Intervention

Jeffrey E. Cohen1, John W. MacArthur1, Jessica L. Howard2, Robert J. Emery2, Emily C. VanderMeer2, Mary A. Sheridan2, Alexandra L. Acker2, Andrew B. Goldstone2, Christopher M. Brusalis2, Alexander S. Fairman2, Jay B. Patel1, Alen Trubelja2, George Hung2, Bryan B. Edwards1, William Hiesinger2, Pavan Atluri2, Y. Joseph Woo1

1Stanford University, Palo Alto, CA; 2University of Pennsylvania, Philadelphia, PA

DISCUSSANT: NICHOLAS G. SMEDIRA

BACKGROUND: The surgical management of varying degrees of mitral regurgitation (MR) in the setting of aortic valve replacement (AVR) for aortic stenosis (AS) remains controversial. Previous work has demonstrated only modest immediate improvement in MR in this setting. The objective of this study was to evaluate the long-term change in MR after AVR to clarify the decision metrics governing mitral intervention.

METHODS: The charts of 578 consecutive patients from 2010–2011 who underwent AVR or aortic root replacement were retrospectively reviewed for demographic, intraoperative, and echocardiographic data. There were 59 patients excluded with no AS. Of the remaining patients, follow-up data of 6–24 months was available for 254 patients. The degree of MR was graded on a standard 0 to 4+ scale.

RESULTS: Of the entire cohort, the mean age was 72.0 ± 0.8 years, 56.3% were male, and 82.7% were undergoing first time cardiac surgery. Preoperative mean EF and mean AV gradient were 56.3 ± 0.8% and 44.6 ± 1.0 mmHg respectively. At follow up, mean EF and mean AV gradient were 59.0 ± 0.7% and 12.6 ± 0.4 mmHg. The mean change in MR was determined for the entire cohort and also stratified for patients with at least preoperative mild MR (n = 173) and mild-moderate MR (n = 66). The mean changes were 0.02 ± 0.05 degrees, −0.16 ± 0.05 degrees, and −0.40 ± 0.09 degrees, respectively. Linear regression analysis demonstrated no relationship between improvement in mean AV gradient and change in MR as shown in the figure that follows.
CONCLUSION: This study further supports the notion that relief of aortic outflow obstruction yields only a modest improvement in MR. Additionally, the linear regression analysis of this long-term data demonstrates that there is no relationship between reduction in AV gradient and change in MR even over a 6–24 month period. These findings argue for at least the need for a prospective examination of aggressive mitral intervention at the time of AVR.
5. Resection of Thymoma Should Include Nodal Sampling  
Benny Weksler¹, Arjun Pennathur², Katie Nason²  
¹University of Tennessee Health Science Center, Memphis, TN; ²University of Pittsburgh Medical Center, Pittsburgh, PA  
DISCUSSANT: SEAN C. GRONDIN

OBJECTIVES: Thymoma is a rare disease best treated by surgical resection; however, there are no clear guidelines on the need for lymph node sampling at the time of surgical resection of thymoma. Additionally, the prognostic implication of nodal metastases is unclear. The aim of this study was to analyze the prognostic implication of nodal metastases from thymoma.

METHODS: The Surveillance, Epidemiology and End Results (SEER) database was queried for all patients who underwent surgical resection of thymoma from 1988 to 2009, survived more than 30 days, and had documented nodal sampling. We compared continuous variables using the Student’s t-test and categorical variables using the Chi-square test. Survival was determined by the Kaplan-Meier method and compared using the log-rank test. A Cox proportional hazard model was used to identify relevant survival variables.

RESULTS: We identified 442 patients in the SEER database who underwent thymoma resection and had lymph node sampling reported. A mean of 3.3 ± 4.7 nodes were sampled per patient. Fifty-nine patients (59/442, 13.3%) had at least one positive node (1.36 ± 0.9 positive nodes per patient, range 1–5). Patients with positive nodes were younger and more likely have Masaoka stage III or IV thymoma (Table 1). Median survival in node-negative patients was 144 months (95% CI 119–169) compared with 98 months (95% CI 71–124) in node-positive patients (p = 0.013) (Figure 1). In multivariate analysis, older age at diagnosis (HR 1.03, 95% CI 1.02–1.05, p < 0.001), higher Masaoka stage (HR 1.23, 95% CI 1.0–1.52, p = 0.05), and the presence of positive nodes (HR 2.08, 95% CI 1.35–3.21, p = 0.001) had significant independent adverse impact on survival.
Table 1. Characteristics of Patients Who Underwent Resection of Thymoma with Lymph Node Sampling

<table>
<thead>
<tr>
<th>Variable</th>
<th>Node-Negative Patients (n = 383)</th>
<th>Node-Positive Patients (n = 59)</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Male sex</td>
<td>198/383 (51.7%)</td>
<td>34/59 (57.6%)</td>
<td>0.490</td>
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<tr>
<td>Caucasian</td>
<td>266/383 (69.5%)</td>
<td>37/59 (62.7%)</td>
<td>0.233</td>
</tr>
<tr>
<td>Age (years)</td>
<td>57.3 ± 14.9</td>
<td>51.9 ± 14.9</td>
<td>0.010</td>
</tr>
<tr>
<td>Mean number of nodes sampled</td>
<td>3.4 ± 4.9</td>
<td>2.9 ± 2.9</td>
<td>0.415</td>
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<tr>
<td>Masaoka stage III or IV</td>
<td>185/351 (52.7%)</td>
<td>44/57 (77.2%)</td>
<td>&lt; 0.001</td>
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</table>

CONCLUSIONS: Nodal status appears to be an important prognostic factor in patients with thymoma independent of Masaoka stage. Patients with higher Masaoka stage have a higher incidence of positive nodes. Until the prognostic significance of nodal metastases is better studied, surgical therapy for thymoma should include sampling of regional lymph nodes, in particular in patients with Masaoka stage III or IV.
6. Pre-Operative Three Dimensional (3-D) Lung Segmental Reconstruction Prior to Anatomic Segmentectomy or Lobectomy for Stage I Non-Small Cell Lung Cancer (NSCLC)

Matthew J. Schuchert¹, Ernest Chan¹, James R. Landreneau², Suicheng Gu³, Jiantao Pu³, David D. Odell¹, Kristen N. McCormick¹, Arjun Pennathur¹, David O. Wilson¹, James D. Luketich¹, Rodney J. Landreneau¹

¹Department of Cardiothoracic Surgery; University of Pittsburgh Medical Center, Pittsburgh, PA; ²Louisiana State University School of Medicine, New Orleans, LA; ³Department of Radiology; University of Pittsburgh Medical Center, Pittsburgh, PA

DISCUSSANT: LEAH M. BACKHUS

OBJECTIVES: There is increasing evidence that anatomic segmentectomy is a reasonable alternative to lobectomy for the management of small, peripheral Stage I NSCLC when anatomically confined to a discrete pulmonary segment, and when acceptable surgical margins can be obtained. Difficulty in estimating the precise segmental location of tumors and assessing adequacy of the resultant surgical margins has discouraged many surgeons from adopting segmentectomy as a primary surgical approach. In an effort to identify whether pre-operative CT imaging can be utilized to identify patients suitable for anatomical segmentectomy, we evaluated a cohort of patients and their pre-operative CT images with a novel analytical software package capable of localizing tumors within a specific segmental distribution and providing three dimensional analytical estimates of lung and tumor volumes as well as expected bronchovascular and parenchymal margins.

METHODS: We utilized a newly-developed proprietary 3-D CT analytical software package to analyze a test set preoperative CT images of patients who underwent segmentectomy (n = 37) or lobectomy (n = 15) for Stage 1 NSCLC. The software package was used to perform autosegmentation of the lung based on defined anatomical structures, and was used to measure tumor size, segmental location, and estimated bronchovascular and segmental margins. In a clinical set of patients undergoing anatomic segmentectomy (n = 19) with clinical Stage I NSCLC, we analyzed the volume and anatomic boundaries of individual segments, as well as the anticipated surgical margins. These CT analyses were then compared to the final pathological surgical margins of the segmentectomy specimens. Volumetric estimates of the resected segment in relation to total lung volumes were performed.
RESULTS: This 3-D CT analytical software package was able to anatomically label segments in 72.3% (34/47) of pre-operative CT images with slice thicknesses ≤2.5 mm [Figure]. None of the patients with 5 mm slice thickness could be autosegmented (n = 5). Reasons for autosegmentation failure included severe emphysema, pneumonitis and slice thickness >2.5 mm. Tumor localization was accurately achieved in all patients whose images were successfully autosegmented (34/34, 100%). Mean tumor size was 1.8 cm. Mean estimated resected segmental volume was 418 ± 209 cm³, constituting on average 22% of the ipsilateral lung volume. This 3-D CT analysis correctly estimated a marginal clearance of >1 cm by segmentectomy in 11/11 (100%) patients confirmed by final pathological review. The CT analysis predicted a ≤1 cm margin in 8 patients, of which 5 (62.5%) were confirmed to have close (≤1 cm) margins pathologically.

CONCLUSIONS: Among thoracic surgeons skilled in the performance of anatomic segmentectomy, this pre-operative 3-D CT analysis of segmental anatomy can confirm tumor location within the segment as well as anticipated surgical margins. This information can assist in the preoperative identification of suitable candidates for anatomic segmentectomy.
+7. Extended Cardiac and Great Vessel Resection for Mediastinal Sarcomas: A 15-Year Single-Institution Experience

New York Presbyterian Hospital – Weill Cornell Medical Center, New York, NY

DISCUSSANT: ROBERT B. CAMERON

OBJECTIVE: Mediastinal sarcomas are rare and aggressive tumors. We sought to evaluate our institutional experience with these malignancies over a 15-year period.

METHODS: A retrospective review of 35 consecutive patients who underwent resection of mediastinal sarcomas that involved the heart, great vessels, or chest wall was conducted.

RESULTS: Thirty-five patients (54% male) with a mean age of 49 years were reviewed. Fifteen (43%) had sarcomas originating from the great vessels, 15 (43%) from the heart, and 5 (15%) from the chest wall. The most common histological subtype was leiomyosarcoma (n = 10, 29%), with synovial cell (n = 6, 17%) and spindle cell (n = 5, 14%) being the next most common. Twenty patients (57%) underwent resection of primary tumors, with 11 (31%) undergoing resection of metastases, and 4 (11%) for recurrent disease. Fifteen total patients (48%) had Stage IV disease. An R0 resection was achieved in 18 patients (53%). Twelve (35%) had an R1 resection and 4 (12%) an R2 resection. Thirty cases (86%) were performed on cardiopulmonary bypass. Twenty-three patients (66%) required concomitant anatomic resection of adjacent structures – 10 pneumonectomies, 5 lobectomies, 4 IVC resections, 3 chest wall resections, 3 wedge resections, 3 diaphragm resections, and 1 esophagectomy. Hospital morbidity and mortality were 41% and 6% respectively. Overall median survival was 24 months (median follow-up of survivors 37 months, range 7–171 months). For patients with stage IV disease, median overall survival was 5 months compared to 27 months for those patients without metastatic disease (p = 0.26). Two-, five-, and ten-year survivals for the entire cohort were 49%, 26%, and 20% respectively. Multivariate analysis demonstrated that incomplete resection predicted poor long-term survival (R1 vs. R0, odds ratio 6.9, p = 0.03). Median survival for patients based on extent of resection were as follows: 101 months for R0 resection, 21 months for R1 resection, and 11 months for R2 resection. Eleven patients (31%) recurred, with a median time to recurrence of 8.5 months. There was no statistically significant difference in median survival time between patients who had a recurrence versus those who did not (37 months versus 24 months, p = 0.998).
CONCLUSIONS: Local tumor control via complete surgical excision offers the best opportunity for prolonged survival in mediastinal sarcomas, even in cases of recurrent or advanced stage disease. Cardiopulmonary bypass and concomitant resection of intrathoracic structures are often required. Local invasion of neighboring structures or the need for cardiopulmonary bypass should not be considered contraindications to resection.
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<tr>
<td>11:40 am – 11:45 am</td>
<td><strong>DAVID J. DUGAN DISTINGUISHED SERVICE AWARD PRESENTATION</strong>&lt;sup&gt;#&lt;/sup&gt;</td>
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<td>Conferred posthumously to Harold C. Urschel, Jr., Dallas, Texas, by David A. Fullerton</td>
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<td>11:45 am – 12:30 pm</td>
<td><strong>INVITED GUEST SPEAKER &amp; SPOUSE FORUM SESSION</strong></td>
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<td>Pacific Ballroom 1</td>
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<td>Making Yourself Just a Little Happier</td>
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<td>Frédéric Luskin</td>
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<td>ADJOURN</td>
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<td>1:30 pm</td>
<td><strong>PADDLE BOARDING EXCURSION</strong>&lt;sup&gt;**&lt;/sup&gt;, Depart from Hotel Group Entrance</td>
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<td>1:30 pm</td>
<td><strong>DOLPHIN &amp; WHALE WATCHING SAFARI</strong>&lt;sup&gt;**&lt;/sup&gt;, Depart from Hotel Group Entrance</td>
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<td>6:00 pm – 10:00 pm</td>
<td><strong>SO-CAL VINTAGE BEACH PARTY THEME DINNER</strong>, Grandlawn North</td>
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** Separate Subscription Required
# Not for Credit
7:30 am – 9:10 am  **SCIENTIFIC SESSION III**

Pacific Ballroom 1  
(10 minutes presentation, 10 minutes discussion)  
Moderators: Susan D. Moffatt-Bruce  
Patricia A. Thistlethwaite

+8. **Sporadic Ascending Aorta Aneurysm: Is it the Diameter of Ascending Aorta a Good Criteria for Surgical Indication?**  
**Calogera Pisano**, Carmela Rita Balistreri, Oreste Fabio Triolo, Daniele Merlo, Vincenzo Argano, Cesira Palmeri, Giovanni Ruvolo  
*Unit of Cardiac Surgery, Department of Surgery and Oncology, University of Palermo, Palermo, Italy*  
**DISCUSSANT: T. BRETT REECE**

**OBJECTIVES:** Evidence regarding the behaviour of sporadic aortic aneurysm (TAA) is limited. We reviewed factors influencing the complications of rupture and dissection in order to give some suggestions which might be used as possible criteria to surgical intervention.

**METHODS:** Aortic specimens were obtained from 161 patients (127 men and 34 women, age 63 ± 10.7 years) undergoing surgical repair of TAA and 18 patients (13 men and 5 women; age: 66.16 ± 9.87 years) undergoing surgical repair for Stanford type A aortic dissection (TAD). A control group of 128 subjects (61 men and 67 woman, age 61.1 ± 5.8 years) was also enrolled. Histopathological and immunohistochemical analyses were performed using adequate tissue specimens, appropriate
techniques and criteria. Genetic risk factors were also investigated. We analysed the potential role of ten common single nucleotide polymorphisms (SNP)s of the following genes: CCR5 (Chemokine C Receptor-5), TLR4 (Toll like Receptor-4), MMP-9 (Metalloproteinases-9), MMP-2 (Metalloproteinases-2), ACE (Angiotensin Converting Enzyme), eNOs (endothelial Nitric Oxide synthase).

**RESULTS:** In the most cases of TAD, ascending aorta is not dilated. TAD is associated with elevated cystic medial degeneration, without substitutive fibrosis, plurifocal medial apoptosis and severe collagenases concentration. Very significant associations were observed between −786T/C eNOs, D/I ACE, −735C/T MMP-2 SNPs and TAD risk. In the case of TAA, we identify three phenotypes in case aorta samples: phenotype I (normal wall); phenotype II (moderate wall thickness); phenotype III (thin and weak wall). No significant differences were detected in term of aortic diameter at the time of operation. Significant statistical differences were observed by comparing abnormalities of extracellular matrix components among three phenotypes (fibrosis p < 0.005; elastic fragmentation p = 0.002; medionecrosis p = 0.004; cystic necrosis p = 0.07; apoptosis p < 0.0001; MMP-9 amount p = 0.004). Significant differences both in genotype distributions and allele frequencies were observed for following SNPs: −1562C/T MMP-9, −786T/C eNOs, +896A/G TLR4, and D/I ACE. In particular patients with TAA phenotype III showed the same histological and genetic features of TAD despite the mean diameter of ascending aorta was smaller than TAA phenotype I and II.

**CONCLUSIONS:** Our suggestion is that the median diameter of ascending aorta is not a sure criteria for surgical indication in patient with TAA, other biomarkers (i.e. histopathological phenotypes and genetic factors) need to be used for an appropriate surgical indication to prevent catastrophic complications of rupture and dissection. Thus, we emphasize this strong aspect to arouse particular interest in the scientific cardio-surgery committee to suggest more appropriate guidelines for a disease with a very increasing incidence in Western populations.
9. Myocardial Cytochrome Oxidase Activity Increases with Age and Hypoxemia in Patients with Congenital Heart Disease – A Basis for Ischemia-Reperfusion Injury
Michael Onwugbufor¹, Richard Levy¹, David Zurakowski², Pranava Sinha¹
¹Children’s National Medical Center, Washington, DC; ²Children’s Hospital Boston, Boston, MA
DISCUSSANT: JOSEPH WOO

BACKGROUND & AIMS: Myocardial protection strategies seen to be beneficial in adults have failed to show comparable benefits in neonates and infants. Myocardial tolerance to ischemic injury is influenced by age and cyanosis, though the underlying physiologic mechanism is unclear. We hypothesized that the activity of cytochrome oxidase (COX) within mitochondria changes based on age and oxygen saturation.

METHODS: Right atrial appendage tissue from prospectively enrolled patients undergoing first time surgical repair or palliation of congenital heart defects was analyzed for steady state COX kinetics by oxidation of ferrocytochrome C via spectrophotometry. Multiple linear regression analysis was used to assess the effects of age and mean preoperative arterial oxygen saturations (SaO2) on the COX activity.

RESULTS: 31 patients with a median age (interquartile range) of 83 days (8–174) and preoperative oxygen saturation of 99% (85–100%) were enrolled. Multiple linear regression analysis predicted significantly greater COX activity in the myocardial tissue for patients with SaO2 < 90% (p = 0.005) and older age (p = 0.013).
CONCLUSION: Myocardial COX activity increased with older age and lower pre-operative oxygen saturations. This may have consequences for myocardium during ischemia-reperfusion and suggests that myocardial protection strategies may need to be tailored specifically to a patient’s age and preoperative hypoxia status. Such an approach needs to be explored further, but may help reduce the risk of ischemia reperfusion injury during congenital cardiac surgery.
+10. **Shorter Length of Stay Is Associated with Increased Readmission Rates Following Esophagectomy**  
Brian C. Gulack, Brian R. Englum, James M. Meza, Amber R. Wilk, Mark F. Berry  
*Duke University Medical Center, Durham, NC*  
**DISCUSSANT: JULES LIN**

**OBJECTIVES:** In the current healthcare environment, shorter length of stay (LOS) following surgical procedures can reduce costs and is often advertised as a surrogate for reduced morbidity, enhanced recovery, and better quality. Although decreasing LOS for some procedures may not negatively impact patient care, shorter LOS for procedures known to be fraught with "late" complications may actually lead to higher readmission rates, and thereby overall cost as well as patient morbidity and mortality. In this study, we sought to determine the association between LOS and readmission rates following esophagectomy.

**METHODS:** Patients who had an esophagectomy for esophageal cancer and who had recorded readmission data in the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database between 2005 and 2011 were reviewed. The association of LOS and readmission was assessed using multivariate logistic regression analysis that included patient demographics, comorbidities, and complications. Complications were categorized as major (organ space infection, pneumonia, pulmonary embolism/deep venous thrombosis, return to operating room, reintubation, renal insufficiency, or dehiscence) and minor (superficial, wound, or urine infection) for the analysis. A secondary analysis was performed excluding patients who died within 30 days of surgery or who had a LOS greater than 21 days to assess the potential bias of including patients who may not have been able to be readmitted due to major operative morbidity or mortality.

**RESULTS:** The readmission rate for 579 patients who met inclusion criteria was 13% (n = 75). The mean LOS for the entire cohort was 15.2 ± 14.6 days, and was significantly shorter for patients who were readmitted compared to patients who were not readmitted (11.6 ± 6.5 versus 15.8 ± 15.4 days, p = 0.021). Demographic data and comorbidities were similar between the readmission/no readmission groups, but readmitted patients had higher rates of both major and minor complications (Table 1). Rates of neoadjuvant chemotherapy (33.3% versus 44.0%, p = 0.193) and neoadjuvant radiation (26.8% versus 38.1%, p = 0.164) were not significantly different between the readmission and no readmission groups. In multivariate analysis,
a longer LOS predicted a lower chance of readmission (adjusted odds ratio [AOR]: 0.93/day, 95% Confidence Interval [CI]: 0.89–0.97, p = 0.001) (Figure 1). Additional factors significantly associated with readmission were both major (AOR: 2.80, 95% CI: 1.59–4.91, p < 0.001) and minor (AOR: 3.11, 95% CI: 1.58–6.13, p = 0.001) complications. When 108 patients with perioperative death or a prolonged initial hospitalization were excluded, a longer LOS continued to predict a lower chance of readmission (AOR: 0.90/day, 95% CI: 0.83–0.98, p = 0.0142).

**CONCLUSIONS:** Shorter LOS after esophagectomy for esophageal cancer is associated with higher readmission rates in the NSQIP database. Efforts to decrease LOS following esophagectomy must minimize the chance of readmission to reduce both potentially avoidable morbidity as well as cumulative overall costs.
OBJECTIVE: Although the development of continuous flow ventricular assist devices (CF-VAD) has improved VAD reliability, exchange is still occasionally necessary. We analyze our experience with device exchange in patients with an implanted primary CF-VAD.

METHODS: A single-center, retrospective review was performed of all patients implanted with a CF-VAD as a primary VAD between December 1999 and November 2013. All VAD exchanges were reviewed; demographics, indications, surgical approach, complications, and outcomes were summarized. Univariate analysis was used to compare baseline differences between patients who did or did not undergo VAD exchange. Time-to-event and survival analyses were also performed. Patients were censored by transplant, explant due to recovery, or death.

RESULTS: The 505 patients underwent 587 CF-VAD implantations. Devices included 420 HeartMate II, 87 Jarvik, and 80 HeartWare VADs (HVADs). Of the patients, 63 (12%) underwent 74 exchanges from a CF-VAD to any CF-VAD (Table 1). The exchanged devices included 57 HeartMate IIs (14% exchange rate), 8 Jarviks (9% exchange rate), and 9 HVADs (11% exchange rate). Among the 63 exchange patients, mean age (± standard deviation) at primary implantation was 52 ± 16 years (range 14–75). Fifty-four patients had a single exchange, and 9 patients had two or more exchanges. Mean time to exchange was 354 ± 393 days (range 1–1652) for the first exchange and 525 ± 394 days (range 9–1259) for any exchange after the first. Primary indications for CF-VAD exchange included hemolysis or thrombosis (defined by elevated lactate dehydrogenase level and/or visualized thrombus at surgery) (n = 46; 62%), VAD-related infection (n = 9; 12%), or other causes (including driveline trauma, inlet malposition, pump failure with unknown cause, attempted suicide, and severe pain) (n = 19; 26%). Surgical approach included resternotomy in 28 patients, left subcostal incision in 40, and left thoracotomy in 6 (all with previous Jarvik implants). Survival analysis of the 63 patients who underwent CF-VAD exchange versus the 442 who did not (Figure 1) showed no significant difference in survival. Similarly, no differences in survival were associated with indications for exchange.
exchange (Figure 2) or device type (Figure 3). Among all CF-VAD exchange patients, 10 underwent successful heart transplantation, 3 had their CF-VADs explanted because of heart failure recovery, 23 had ongoing support, and 27 died during device support.

Table 1. Continuous-Flow Ventricular Assist Device Exchange Cohort Characteristics.

<table>
<thead>
<tr>
<th>Device Type</th>
<th>First exchange (n=63)</th>
<th>Two or more exchanges (n=9)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jarvik-2000</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>HeartMate II</td>
<td>48</td>
<td>9</td>
<td>57</td>
</tr>
<tr>
<td>HVAD</td>
<td>8</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Indication for Exchange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrombosis/Hemolysis</td>
<td>41</td>
<td>5</td>
<td>46</td>
</tr>
<tr>
<td>Infection</td>
<td>7</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Mean (± SD) Time to Exchange (Days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range: 1-1652</td>
<td>354 ± 393</td>
<td>525 ± 394</td>
<td>46</td>
</tr>
<tr>
<td>Surgical Approach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left subcostal</td>
<td>36</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Resternotomy</td>
<td>22</td>
<td>6</td>
<td>28</td>
</tr>
<tr>
<td>Left thoracotomy</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

HVAD = HeartWare Ventricular Assist Device; SD = standard deviation.
CONCLUSION: This is the largest series of CF-VAD exchanges reported to date. Our data suggest that aggressive surgical treatment of CF-VAD pump-related complications with exchange can be safely performed for a variety of indications without adversely affecting survival.
12. Extra-Corporeal Membrane Oxygenation (ECMO) As a Bridge to Lung Re-Transplantation in the United States: Is There a Role?
Awori J. Hayanga¹, Jonathan Aboagye², Norihisa Shigemura¹, Stephen Esper¹, Lynn Huffman¹, Heather Kaiser³, Jay Bhama¹, James D. Luketich¹, Jonathan D’Cunha¹
¹University of Pittsburgh Medical Center, Pittsburgh, PA; ²Johns Hopkins School of Public Health, Baltimore, MD; ³Johns Hopkins School of Medicine, Baltimore, MD

DISCUSSANT: JASLEEN KUKREJA

BACKGROUND: Extra-Corporeal Membrane Oxygenation (ECMO) has been increasingly utilized as a bridge to lung transplantation in patients with end stage lung disease. Its utility, however, in bridging patients in the context of re-transplantation has not been fully elucidated. We sought to evaluate outcomes following the use of ECMO as a bridge to re-transplantation.

METHODS: Data from the Scientific Registry of Transplant Recipients (SRTR) data files from United Network for Organ Sharing (UNOS) database were analyzed to evaluate recipients who had undergone re-transplantation between 1988 and 2012. The recipients were categorized into two groups, based upon the use of ECMO prior to re-transplantation (re-LT). Using Kaplan Meier analysis, 30-day, 90-day, and 1-year survival were compared in both groups. A Cox regression model was used to identify the predictors of 1 and 5–year mortality among patients who had ECMO as a bridge to re-LT using recipient, donor, and transplant related variables.

RESULTS: A total of 854 adults with complete data on survival status were identified comprising 55 (6.8%) patients in whom ECMO support was used as a bridge to re-transplantation and 799 (93.2%). The ECMO group were more likely to have a higher BMI (p = 0.003), higher total bilirubin (p = 0.002), to have undergone bilateral lung transplantation (p = 0.01), be diabetic (p = 0.04), be on mechanical ventilation (p < 0.0005), and to be hospitalized in the Intensive Care Unit compared to the non-ECMO group. They were also more likely to: have a diagnosis of bronchiolitis obliterans (p < 0.0001), be on inhaled nitric oxide (p < 0.0001), be older (p = 0.04), and to have a shorter waiting time before re-transplantation (p < 0.0001). There were no significant differences in recipient race, age, gender, donor smoking, type of donor, graft ischemic time, HLA-mismatch level, or ABO mismatch level. The 30-day survival for patients in the ECMO group was lower (67.3% vs 91.2%, p = 0.0002). Similarly too, were the 90-day survival (59.6% vs 83.7%, p = 0.0004), 1-year survival (44.8% vs 69.3 p = 0.0006) and 5-year survival (21.4% vs 38.1%, p = 0.02) compared to the non-ECMO group. Being an obese recipient of a lung transplant was identified as the only predictor of 5-year mortality after re-transplantation. (HR 2.97 (1.18–7.50), p = 0.02).
CONCLUSIONS: This contemporary analysis of outcomes following the use of ECMO as a bridge to re-transplantation clearly delineates its poor prognosis. The institution of ECMO in patients being considered for re-LT, therefore, portends a grim prognosis and may serve as caution to programs for this high-risk cohort.
9:10 am – 10:00 am **POSTGRADUATE COURSE**

*Pacific Ballroom 1*

*Sponsored by: White Memorial Medical Center and Foundation’s – Lyman A. Brewer, III, Fund, and Thomas J. Fogarty*

**From Checklists to Culture, What Spacewalking Brings to Surgery**

The Aerospace Sector effectively demonstrates the benefits of high reliability organizations and the tremendous success that follows linking culture to safety, quality and performance. This talk will explore the principles of leadership in high reliability organizations and the applicability of these principles to the zero-fault-tolerant environment of spacewalking and surgery. Participants will learn the key elements of leadership and peak team performance and how these can be implemented in surgical practice.

David Williams, MD
President and CEO
*Southlake Regional Health Centre, Ontario, Canada*

10:00 am – 10:30 am **COFFEE BREAK, VISIT EXHIBITS & POSTERS,**

*Pacific Ballroom 2-3*
FRIDAY

10:30 am – 11:30 am  SCIENTIFIC SESSION IV

Pacific Ballroom 1
(10 minutes presentation, 10 minutes discussion)

Moderators: John C. Chen
Richard I. Whyte

+13. Spinal Cord Protection via Alpha-2 Agonist Mediated Increase in Glial Cell Derived Neurotrophic Factor
Kirsten A. Freeman, Lisa S. Foley, Marshall T. Bell,
Cleveland, Jr., Xianzhong Meng, Paco Herson,
*David A. Fullerton, *T. Brett Reece
University of Colorado Denver, Aurora, CO
DISCUSSANT: JOHN IKONIMIDIS

OBJECTIVE: Delayed paraplegia secondary to ischemia-reperfusion (IR) injury is a devastating complication of thoracoabdominal aortic surgery. Alpha-2 agonists have been shown to attenuate IR injury, however the mechanism for protection has yet to be elucidated. A growing body of evidence suggests that astrocytes play a critical role in neuroprotection by release of neurotrophins. We hypothesize that alpha-2 agonism with dexmedetomidine increases glial cell derived neurotrophic factor (GDNF) in spinal cord astrocytes to provide spinal cord protection.

METHODS: Spinal cords were isolated en bloc from C57BL/6 mice, and astrocytes were selected for with an Optiprep density gradient. Primary spinal cord astrocytes were grown in astrocyte media comprised of neurobasal A with B27, glutamax, and antibiotic supplements. On the day of the experiment cells, media was changed and astrocytes were treated with 0.1 uM, 1 uM, and 10 uM dexmedetomidine. Cell media was collected at various timepoints post treatment. Glial cell derived neurotrophic factor (GDNF) was then tested for by ELISA. Additionally, studies were done using an alpha-2 receptor antagonist prior to dexmedetomidine treatment followed by sample collection and ELISA for GDNF.

RESULTS: Spinal cord primary astrocytes treated with dexmedetomine at 1uM and 10uM had significantly (p < 0.05) increased GDNF production compared to control (Figure 1). There was not a significant difference between the 1 uM and 10 uM treatment. Dexmedetomidine treatment at 0.1uM did not significantly increase GDNF. Alpha-2 antagonist treatment prior to dexmedetomidine treatment abolished the GDNF production seen with dexmedetomidine treatment indicating that GDNF production is via the alpha-2 receptor.

+ Samson Resident Prize Essay
* WTSA Member
CONCLUSIONS: Astrocytes have been shown to preserve neuronal viability via release of neurotrophic factors. Dexmedetomidine increases glial cell derived neurotrophic factor from spinal cord astrocytes via the alpha-2 receptor. Treatment with alpha-2 agonist dexmedetomidine may be a clinical tool for use in spinal cord protection in aortic surgery.
14. Failure-to-Rescue and Pulmonary Resection for Lung Cancer

Farhood Farjah¹, *Leah M. Backhus¹,
Aaron M. Cheng¹, Brian Englum², Sunghee Kim²,
Paramita Saha-Chaudhuri², *Douglas E. Wood¹,
*Michael S. Mulligan¹, *Thomas K. Varghese¹
¹University of Washington, Seattle, WA; ²Duke University, Durham, NC

DISCUSSANT: ROBERT J. CERFOLIO

OBJECTIVES: The incidence of post-operative complications does not vary markedly across hospitals ranked by risk-adjusted operative mortality rates, but the ability to rescue patients who experience complications does. Failure-to-rescue is defined as death after a post-operative complication, and has been observed among hospitals that perform general, vascular, and cardiac surgery. This study aims to evaluate variation in complication and failure-to-rescue rates among hospitals that perform pulmonary resection for lung cancer.

METHODS: Using the Society of Thoracic Surgeons General Thoracic Database (STS-GTDB), a retrospective cohort study was performed among adult patients who underwent pulmonary resection for lung cancer. Hospitals participating in the STS-GTDB were ranked according to risk-adjusted operative mortality rates using Bayesian random effect logistic regression and grouped into quintiles. Risk-adjusted operative mortality rates were estimated by the O/E ratio method. Unadjusted and adjusted rates of overall rates of complications and failure-to-rescue were compared across groups of hospitals.

RESULTS: Between 2009 and 2012, there were 30000 patients (median age 68 years, 53% women, 87% white, 71% lobectomy, 65% stage I) cared for at 208 institutions participating in the STS-GTDB. Risk-adjusted operative mortality rates varied over 4-fold across hospital groups (Table 1). Overall complication rates varied significantly across centers (quintile 1_36%, quintile 2_34%, quintile 3_36%, quintile 4_39%, quintile 5_42%; p < 0.001), though the magnitude of variation was relatively small. Failure-to-rescue rates varied significantly across hospitals (quintile 1_1.7%, quintile 2_3.1%, quintile 3_3.8%, quintile 4_4.6%, quintile 5_6.8%; p < 0.001), and the magnitude of variation was just under 4-fold. After adjustment, the odds of failure-to-rescue was 4.18 (95% confidence interval 3.28–5.32) higher at the worst versus best performing hospitals.

* WTSA Member
### Variation in Rates of Complications and Failure-To-Rescue Across STS-GTDB Hospitals Ranked by Risk-A Quintile

<table>
<thead>
<tr>
<th></th>
<th>Quintile 1</th>
<th>Quintile 2</th>
<th>Quintile 3</th>
<th>Quintile 4</th>
<th>Quintile 5</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>10307</td>
<td>5226</td>
<td>2009</td>
<td>5727</td>
<td>6731</td>
<td></td>
</tr>
<tr>
<td>Hospitals</td>
<td>41</td>
<td>42</td>
<td>42</td>
<td>42</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Risk-adjusted mortality</td>
<td>0.7%</td>
<td>1.2%</td>
<td>1.5%</td>
<td>2.2%</td>
<td>2.9%</td>
<td></td>
</tr>
<tr>
<td>Any complication</td>
<td>36%</td>
<td>34%</td>
<td>36%</td>
<td>39%</td>
<td>42%</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Failure-to-rescue</td>
<td>1.7%</td>
<td>3.1%</td>
<td>3.8%</td>
<td>4.6%</td>
<td>6.8%</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Hospital performance is more strongly associated with rescuing patients from complications than it is with preventing complications among patients undergoing pulmonary resection for lung cancer. This observation is timely given emerging regional quality improvement initiatives in thoracic surgery grappling with how best to improve outcomes. An early goal of such initiatives may be to identify several local hospitals with the lowest failure-to-rescue rates with the intent of characterizing, disseminating, and implementing their system- and process-based approaches to early-detection and effective management of complications.
15. Introducing Transaortic Valve Implantation: Effect of the Learning Curve on Clinical Outcome – A Single Centre Experience

Davide Gabbieri¹, Paolo R. Cimato¹, Italo Ghidoni¹, Guglielmo Stefanelli¹, Giuseppe D’Anniballe², Alberto Benassi², Clorinda Labia², Polo Pisi³, Gianbeppe Giordano⁴, Tiziana Paglia⁴, Marco Meli⁴

¹Department of Cardiovascular Surgery, Hesperia Hospital, Modena, Italy; ²Department of Cardiology, Hesperia Hospital, Modena, Italy; ³Department of Radiology, Hesperia Hospital, Modena, Italy; ⁴Department of Anesthesiology, Hesperia Hospital, Modena, Italy

DISCUSSANT: ALFREDO TRENTO

OBJECTIVES: Transcatheter aortic valve implantation (TAVI) in patients with poor peripheral vessels still remains problematic, as the transapical approach is not always feasible. The purpose of this study was to evaluate the efficacy and safety of the transaortic (TAO) TAVI according to VARC criteria and its role in the choice of the access route.

METHODS: Among 121 patients (February 2010 to September 2013), TAO-TAVI was performed in 15 consecutive patients using a balloon-expandable transcatheter heart valve. Initially, the TAO route was chosen when conventional TAVI approaches (transfemoral-TF and transapical-TA) were not possible, and afterwards, with increasing experience, as a preferred approach in non-TF, non-off-label, patients. The suitability for a TAO approach, as well as valve anatomy and annulus size, were assessed by multidetector computed tomography and transesophageal echocardiography. The aorta was exposed either through a mini-sternotomy (J-upper sternotomy) in 11 cases (73.3%) or through a right anterior thoracotomy in 4 (26.7%). After sheath insertion, retrograde guidewire crossing of the aortic valve, and balloon valvuloplasty, the device was then positioned and subsequently deployed. After discharge, patients were followed at 6 and 12 months, and then every year.

RESULTS: Mean age was 80 ± 5.8 years (71–91) and logistic EuroSCORE 18.4 ± 11.8% (6.2–44.5). Device success rate was 93.3%. Conversion to open chest surgery was required in 2 patients (13.3%) due to valve embolization in 1 case and tamponade due to left ventricle stiff wire perforation in the other one. Paravalvular leak ≥2/4 was observed in 1 patient (6.7%). No cerebrovascular accidents and third-degree AV block were observed. Transfusion ≥4 units was performed in 6 patients (40%). Intensive care unit (ICU) < 24 hours and total hospital stay < 14 days were 60% (9 patients) and 80% (12 patients), respectively. No cases of thirty-day mortality were recorded. Thirty-day combined safety endpoint was reported in 13.3%. Two deaths occurred during the follow-up time (range from 0.2 to 12.2 months, mean 5.7 ± 3.9),
both due to non-cardiac causes. Six-month and one-year survival were both 80%, with 6 and 2 patients at risk respectively. Baseline characteristics, procedural characteristics and post-procedural outcomes of the study population are summarized in Figure 1.

| Age (years) | 80±5.8 years | Urgent-Emergent surgical priority | 13.3% (2) |
| Male gender | 46.7% (7) | Valve size 23, 26, 29 mm | 40-33.3-6.7% (6,8,1) |
| BMI (kg/m²) | 29.3±2.4 | Device success | 93.3% (14) |
| Diabetes | 46.7% (7) | Local infection | 0 |
| Dyslipidemia | 73.3% (11) | Aortic dissection | 0 |
| Hypertension | 100% (15) | Cardiac tamponade | 6.7% (1) |
| History of smoke | 33.3% (8) | Annulus rupture | 0 |
| Pulmonary Hypertension * | 13.3% (2) | Valve migration | 6.7% (1) |
| History of PCI | 13.3% (2) | Coronary occlusion | 0 |
| PCI before TAVI | 40% (6) | PI mean gradient (mmHg), (min–max) | 10.9±3.3 (6-19) |
| Previous CABG | 6.7% (1) | LVEF (%) | 33.7±7.9 |
| Recent MI * | 13.3% (2) | AR grade 0 and 1 (4) | 93.3% (14) |
| Atrial fibrillation | 20% (3) | AR grade 2 (4) | 6.7% (1) |
| Previous cerebrovascular accident | 26.7% (4) | AR grade 3 (4) | 0 |
| COPD * | 20% (3) | MR grade 0 | 13.3% (2) |
| Extracardiac arteriopathy * | 33.3% (5) | MR grade 1 (4) | 60% (9) |
| Creatinine (mg/dl), mean | 1.1±0.4 | MR grade >1 (4) | 26.7% (4) |
| NYHA class III/IV | 100% (15) | New pacemaker | 0 |
| Acute Heart Failure <15 days | 13.3% (2) | Acute kidney injury (Stage 2 and 3) | 13.3% (2) |
| LogEuroSCORE (%), mean | 18.4±11.8 (6.3-44.5) | In-hospital CVA | 0 |
| LVEF (%) | 51±10.9 | MV time <6 hours | 60% (9) |
| LVEF <40% | 6.7% (1) | Transfusion ≥4 units | 40% (6) |
| MR grade ≥2/4 | 26.7% (4) | ICU stay <24 hours | 60% (9) |
| Aortic annulus size (TEE, mm) | 22±2.3 | In-Hospital stay <14 days | 60% (9) |
| Contrast Medium Volume (ml) | 244±66.8 | 30-day mortality | 0 |
| Fluoroscopy time (min) | 16.1±3.1 | 30-day combined safety point | 133.3% |

Values are expressed as n (%), mean ± SD or median [interquartile range (IQR)]; AR: Aortic regurgitation; BMI: body mass index; MR: Mitral regurgitation; NYHA: New York Heart Association; PCI: percutaneous coronary intervention; CABG: coronary artery bypass graft; COPD: chronic obstructive pulmonary disease; CVA: cerebrovascular accident; LVEF: left ventricular ejection fraction; MI: myocardial infarction; Mechanical ventilation P: post implantation. *EuroSCORE definition.

**CONCLUSIONS:** The “learning phase” related to the introduction of the TAO approach seems to have no impact on the procedural safety and clinical outcome of the patients. Therefore, this access route could prove a valid alternative to the trans-apical approach with an acceptable operative risk.
11:30 am – 12:30 pm  **CATHERETER-BASED MITRAL VALVE REPLACEMENT: WHAT IS IT AND IS IT POSSIBLE?**
Moderator: Michael P. Fischbein
Speakers: Anson Cheung
Saibal Kar

12:30 pm  **ADJOURN**

1:20 pm  **GOLF TOURNAMENT**, Monarch Beach Golf Links

2:00 pm  **TENNIS TOURNAMENT**, The Tennis Club

**FREE EVENING**

** Separate Subscription Required
CONCURRENT FORUMS
(5 minutes presentation, 3 minutes discussion)

ADULT CARDIAC

Pacific Ballroom 1

Moderators: Anthony D. Caffarelli
Frederick A. Tibayan

CF1. Right Mini-Thoracotomy Versus Sternotomy Approach to Mitral Valve: A Propensity Matched Study
Paul Tang, Mark Onaitis, Bhargavi Desai, Jeffrey G. Gaca, Carmelo A. Milano, Mark Stafford-Smith, Donald Glower
Duke University Medical Center, Durham, NC

OBJECTIVES: Compared to conventional median sternotomy (MS), a right mini-thoracotomy (RT) approach to mitral valve surgery remains controversial without conclusive randomized, controlled data to compare the 2 approaches. Therefore, a retrospective analysis of a single institution experience was performed using propensity matching of patients to compare the mortality and morbidity between the MS and RT techniques.

METHODS: A retrospective review of the Duke cardiothoracic surgery database from 1986 to 2010 identified patients who underwent mitral valve surgery. Patients who had procedures that were not usually performed through a RT approach (e.g. aortic valve or aortic surgery) were excluded. There were 2306 patients fulfilling the above criteria. Using 1:1 propensity score matching based on comorbidities, year of operation and surgeon, we obtained 378 matched patients in each group for outcomes analysis.
RESULTS: There was no difference in the median year of operation between the two groups (2000 vs 2001, P = 0.661). Predictors of postoperative mortality include operative year (HR = 0.965, P = 0.01), age (HR = 1.039, P < 0.001), preoperative dialysis (HR = 2.810, P = 0.001), peripheral vascular disease (HR = 2.092, P = 0.001), lung disease (HR = 2.096, P < 0.001), diabetes (HR = 1.529, P = 0.016), higher congestive heart failure class (HR = 1.229, P = 0.025) and redo operations (HR = 1.560, P = 0.001). A high ejection fraction was predictive of survival (HR = 0.985, P = 0.003). Incidence of postoperative complications with a RT approach was lower in terms of new onset atrial fibrillation (9% vs 14%, P = 0.039), pacemaker insertion (3% vs 10%, P = 0.001), and acute renal failure (2% vs 7%, P = 0.002). Multivariate analysis showed a thoracotomy approach was associated with less postoperative acute renal failure (OR = 0.193, P = 0.001) whereas hypertension (OR = 3.248, P = 0.024), high preop creatinine (OR = 1.426, P < 0.001), and higher CHF class (OR = 1.741, P = 0.026) was associated with increased postoperative acute renal failure. Operative parameters for the RT versus MS groups are aortic cross clamp time (111 vs 94 min, P < 0.001) and cardiopulmonary bypass (173 vs 165 min, P = 0.049). RT was associated with lower chest tube outputs (365 vs 945 mls, P < 0.001) and less packed red blood cell transfusions (2 vs 3 units, P < 0.001). The rate of mitral valve repair was higher in the RT group (56% vs 41%, P < 0.001). There were no differences in postoperative survival between the 2 groups (P = 0.133) using Mantel-Cox statistics (Figure 1).
CONCLUSIONS: A RT approach compared with MS was associated with a lower incidence of postoperative atrial fibrillation, permanent pacemaker insertion and acute renal failure. There was also less chest tube output and use of PRBC. Given study limitations, the RT approach may have advantages over MS in selected patients at some institutions.
OBJECTIVES: Minimally invasive surgery has been shown to cause less morbidity than conventional surgery at the expense of time. Sutureless aortic bioprosthesis bear the potential of simplifying implantation thereby reducing ischemic time. Our purpose is to evaluate expanded follow up for the use of a Sutureless aortic valve bioprosthesis through a mini-sternotomy.

METHODS: Since 2010, 191 patients underwent aortic valve implantation with a Sutureless bioprosthesis. Of these, 113 (mean age 78 ± 4.7 years, 62 women) underwent surgical aortic valve implantation via mini J-sternotomy. Clinical and echocardiographic data were recorded.

RESULTS: The patients received a size S (9), M (41), L (54) or XL (9) prosthesis, either as isolated (100) or combined procedures (13) via J-sternotomy including a 1 Redo-patient who had undergone CABG via full sternotomy. Mean logistic European system for cardiac operative risk evaluation was 10.1 ± 6.4%, mean aortic cross-clamp time was 38 ± 12 minutes (33 ± 6 minutes for isolated procedures). One conversion to full sternotomy was necessary due to coronary sinus bleeding. In-hospital mortality was 2.6% (all not cardiac); mean hospital stay was 10.2 ± 2.2 days. We recorded 8 pacemaker implantations (7%). At follow-up (20 ± 11 months, range 2 to 42), we noticed 4 deaths (3 non cardiac and 1 unknown). Mean transprosthetic gradients were: 13 ± 3, 11 ± 3, 10 ± 3, postoperatively, at 6 months, at 1 year, and 2 years, respectively. No paravalvular leak was recorded.

CONCLUSIONS: The Sutureless bioprosthesis shows satisfactory clinical and hemodynamic results. Due to its simple implantation technique, it represents a viable option for minimally invasive access surgery via J-sternotomy. Transvalvular gradients remain low up to 2 years follow up. Longer term follow up is needed to confirm the durability of the prosthesis.
CF3. Training Junior Faculty Improves Reliability of Skills Assessment in Cardiac Surgery

Xiaoying Lou¹, Richard Lee², Richard Feins³, Daniel Enter¹, George Hicks⁴, *Edward Verrier⁵, *James Fann⁶
¹Northwestern University, Chicago, IL; ²St. Louis University, St. Louis, MO; ³University of North Carolina at Chapel Hill, Chapel Hill, NC; ⁴University of Rochester Medical Center, Rochester, NY; ⁵University of Washington Medical Center, Seattle, WA; ⁶Stanford University, Palo Alto, CA

OBJECTIVES: Previous work has demonstrated excellent inter-rater reliability in objective assessment of simulated anastomoses among experienced educators. We evaluated inter-rater reliability of less experienced educators and the impact of focused training with a video-embedded coronary anastomosis assessment tool.

METHODS: Nine junior cardiothoracic surgery (CTS) faculty members (mean and median yrs post training: 3.9 years and 2 years, respectively) from different institutions evaluated two videos of simulated coronary anastomoses (one by a medical student and one by a CTS resident) at the TSDA Boot Camp. They then underwent a 30-minute training session using an assessment tool with embedded video clips to anchor rating scores for 10 components of coronary artery anastomosis (listed in Table). Afterwards, they evaluated two videos of a different student and resident performing the task. Components were scored on a 1 to 5 scale (low to high, Likert scale), yielding an average composite score. Inter-rater reliabilities of composite scores as well as component scores were assessed using intraclass correlation coefficients (ICC) and overall pass/fail ratings with kappa. Internal consistency was evaluated with Cronbach’s α.

RESULTS: Inter-rater reliability for composite scores improved after training, from moderate (ICC = 0.76) to strong (ICC = 0.90) agreement. All components of the assessment tool exhibited improvement in inter-rater reliability, with four (bite, needle holder use, needle angles, and hand mechanics) improving the most from poor (ICC range: 0.09–0.48) to strong (ICC range: 0.80–0.90) agreement. The mean ICC across components increased from 0.51 to 0.84 after focused training. Inter-rater reliability for overall pass/fail ratings also improved from poor (kappa = 0.20) to moderate (kappa = 0.78) agreement. Internal consistency remained stable with Cronbach’s α >0.98 both before and after training, indicating that the assessment components reliably measured the same set of skills.

* WTSA Member
CONCLUSIONS: Focused, video-based anchor training facilitates greater inter-rater reliability in the objective assessment of simulated coronary anastomoses, particularly for traditionally difficult-to-teach components (e.g., needle angles, needle transfer, suture management). Among raters with less teaching experience, such training may be needed prior to objective evaluation of technical skills.
OBJECTIVES: Paraplegia remains a devastating complication of complex aortic surgery, occurring in up to 20% of cases. Erythropoietin (EPO) has been shown to prevent paraplegia following ischemia reperfusion, but its mechanism is poorly understood. A potential downstream transcription factor, cAMP response element binding protein (CREB), is known to attenuate ischemic injury. We hypothesized that erythropoietin induces the CREB pathway and neurotrophin production in the murine spinal cord, attenuating neurologic and cytoarchitectural injury.

METHODS: Adult male mice were subjected to ischemia reperfusion injury via 4 minutes of aortic arch and left subclavian crossclamp occlusion. Experimental groups included EPO treatment 4 hours prior to incision (n = 7), ischemic control (n = 7), and shams (n = 4), which underwent median sternotomy without crossclamp placement. Hind limb function was assessed using the Basso motor score for 48 hours after reperfusion. The spinal cords were harvested and analyzed for neuronal viability using histology and Fluorojade staining. Additionally, non-ischemic adult male mice underwent EPO (n = 16) or normal saline (n = 7) administration and spinal cords were harvested at intervals up to 48 hours. Expression of pAKT, pCREB, BCL-2, and BDNF were determined using immunoblotting.

RESULTS: EPO significantly preserved hind limb function following ischemia reperfusion injury (p < 0.01). By 36 hours, the entire ischemic control group had lost hind limb function (Basso score of 0). The EPO treatment group, however, remained ambulatory with a mean Basso score of 6.4 ± 1.2 on a scale of 9. H&E staining demonstrated preserved cytoarchitecture in the EPO treatment group. Immunoblotting of the spinal cord homogenate showed significant increases in phosphorylated AKT (p = 0.021) and phosphorylated CREB (p = 0.038). EPO administration increased AKT and CREB phosphorylation by 183.3% ± 9% (p < 0.01) and 171.4% ± 16% (p = 0.03), respectively. Relative protein expression of BCL-2 and BDNF in response to EPO administration was evaluated in non-ischemic spinal cords. EPO treatment induced expression of both BCL-2 and BDNF beginning at 12 hours. BDNF was significantly increased through 48 hours (p = 0.011), while BCL-2 levels peaked at 24 hours and rapidly declined by 48 hours (p = 0.042).
CONCLUSIONS: Erythropoietin-mediated induction of the CREB pathway and production of neurotrophins is associated with improved neurologic function and increased neuronal viability following spinal cord ischemia reperfusion. The results of this experiment elucidate erythropoietin pathways and provide insight into potential pharmacologic treatments.
CF5. **One-Year Results of Rescue Trial: TEVAR for Traumatic Aortic Injury Remains a Favorable Therapeutic Approach at Mid-Term Follow-Up?**
Ali Khoynezhad¹, Carlos Donayre², Ali Azizzadeh³, Rodney White²

¹Cedars-Sinai Medical Center, Los Angeles, CA; ²Harbor-UCLA Medical Center, Torrance, CA; ³Herman Memorial Hospital, Houston, TX

**OBJECTIVES:** Blunt aortic injury (BAI) remains the second leading cause of death from non-penetrating trauma. TEVAR has been popularized as preferred operative approach for patients with BAT due to favorable early outcomes. The midterm follow-up of patients undergoing TEVAR for BAI is poorly understood. We present the results and one-year follow-up of the prospective, multi-center RESCUE trial.

**METHODS:** RESCUE is a prospective, non-randomized, multi-center trial using Medtronic Valiant Captivia stent graft, conducted at 20 sites in North America. 50 patients with BAI were enrolled between April 2010 and January 2012. The primary endpoint was all-cause mortality. Secondary endpoints were adverse events related to the procedure, device or aorta, aortic-related mortality and successful device delivery and deployment. Mean follow-up 18 months (18–40 months). Follow-up was complete except in four (8%) patients: they were lost to follow-up between one-year and two-year mark.

**RESULTS:** Mean age of the patients was 40.7 ± 17.4 years, and 38 (76%) patients were male. Fifty-two thoracic stent grafts were implanted within a median of 1.0 day following injury (mean 1.8 ± 4.0 days). 70% (35/50) of aortic injuries were grade 3 or higher, including one patient with free rupture. Mean injury severity score was 37.6 ± 14.3. Vascular access, device delivery and deployment were successful in all patients. The left subclavian artery was completely covered in 40% of patients (20/50) and partially covered in 18% of patients (9/50). No patient developed spinal cord injury and there were no cerebrovascular accidents. The median procedure time was 90.5 minutes, and median hospital stay was eleven days.

Early and one-year all-cause mortality was 8% (n = 4) and 14% (n = 7). No patient underwent conversion to open repair or required an endovascular re-intervention. Three (6%) patients had subclavian artery revascularization: one preoperatively, and two others on postoperative day 36 and 103. One patient (2%) had evidence of migration of stent graft at one-year. There were no endoleak, stent graft kinking, twisting, fracture, mal-aligned deployment or loss of patency and integrity during entire follow-up. There was no device-related adverse events, however, one patient (2%), and nine patients (18%) had aortic-related and procedure-related adverse events in entire follow-up, respectively.
CONCLUSIONS: TEVAR has favorable mid-term outcomes, and should be the treatment modality of choice in anatomically suitable patients with BAI. Follow-up of this patient cohort remains a challenge, and Longevity of the stent grafts in this young patient population is yet to be established.
CF6. Determinants of Variation in Cost-Effectiveness of TAVR in Inoperable Patients

Nimesh Desai, Kelly Sutter, Lisa Walsh, Robert Stetson, Saif Anwaruddin, Jay Giri, Prashanth Vallabhajosyula, Rohan Menon, Robert Li, Wilson Szeto, Howard Herrmann, Joseph Bavaria

University of Pennsylvania, Philadelphia, PA

OBJECTIVES: TAVR is now an established treatment for aortic stenosis (AS) in patients otherwise deemed too high risk for open surgical aortic valve replacement. Early cost-effectiveness data has suggested TAVR has similar benefits to well established interventions including outpatient hemodialysis. Within the inoperable TAVR population, there is patient-related variation in both hospital costs and survival probability. We sought to determine the impact of patient characteristics on the cost effectiveness of TAVR in inoperable patients.

METHODS: Between November 2007–June 2012, 202 inoperable patients underwent TAVR at two academic medical centers. Actual patient costs for the index inpatient hospital encounter, including the current commercial TAVR valve cost (Edwards-Sapien: $32,500) were derived using a robust, validated costing system. Patients were divided according to key risk groups to determine causes of variability in patient survival and costs. Kaplan-Meier and exponential survival models were employed.

RESULTS: The mean index hospitalization cost for patients was $58,420 ± $20,022. Costs and survival were calculated by STS risk tertile, age, renal disease and pulmonary disease. Among these, STS risk tertile was most highly associated with cost and survival. Index hospitalization cost was $56,035 in the lowest STS risk tertile (STS Score < 8.8) versus $62,222 in the highest tertile (STS Score > 12–33), p = 0.055. At 30-months, survival was 73% in the lowest STS risk tertile versus 34% in the highest tertile, log rank: p = 0.03. Estimated life expectancy using an exponential model was 3.7 yrs (95% CI2.2–4.7 yrs) in the low STS tertile and 1.9 years (95% CI0.8–3.1 yrs) in the high STS tertile, respectively. Life years gained, derived from the baseline life expectancy in the medical management arm from the PARTNER-1B trial, was assumed to be 1.2 years. Hence, low STS tertile patients experienced a predicted life year gain of 2.5 years and highest STS tertile patients experienced a life year gain of 0.7 years versus medical management. The predicted cost-per life year gained of TAVR, based on the cost of the index procedure hospitalization alone, was $22,414 and $88,888 in patients with low and high STS scores, respectively.

CONCLUSIONS: Among patients with AS who are deemed inoperable for open surgery, individual risk factor profile as determined by STS score is associated with variation in cost, survival and overall cost effectiveness.
CF7. Effect of Patient Age on Blood Product Transfusion Following Cardiac Surgery
Niv Ad, Eric Sarin, Alan M. Speir, Linda Halpin, Graciela Pritchard, Linda Henry, Sari D. Holmes
Inova Heart and Vascular Institute, Falls Church, VA

OBJECTIVES: Blood product transfusion following cardiac surgery was shown to be associated with increased perioperative and long-term morbidity and mortality. Transfusion thresholds are often lowered in the elderly despite the lack of clinical evidence for this practice. The effects of transfusion in a specific subset of elderly patients following cardiac surgery have not been previously described. This study sought to examine the predictors for transfusion and its associated effects following cardiac surgery, particularly in elderly patients.

METHODS: Since 2007, 1947 non-emergent cardiac surgery patients with uneventful postoperative course and short ICU stay (<24 hrs) were identified (age ≥ 75: n = 255). Dichotomous outcomes were evaluated with Chi-Square/Fisher’s Exact test or logistic regression. Effect of patient age and blood products on survival was assessed using multivariate Cox proportional hazard modeling.

RESULTS: Patients aged 75 years and over were more likely to receive intraoperative (10% vs 4%, p < 0.001) and postoperative (8% vs 3%, p < 0.001) blood products. After adjusting for clinical covariates and preoperative hematocrit, age over 75 was associated with greater odds for receiving intraoperative (OR = 2.03, p = 0.005) and postoperative blood products (OR = 2.27, p = 0.004). There was significant increased risk of complications per unit of blood product transfused regardless of patient age (Table). Within the group aged over 75, receipt of any blood products was associated with greater perioperative morbidity including increased median LOS (5 vs 4 days, p = 0.002), more pneumonia (5% vs 0%, p = 0.02), more prolonged ventilation (13% vs 0.5%, p < 0.001), more renal failure (5% vs 0%, p = 0.02), and higher 30 day mortality (p < 0.001). Cox regression revealed that in addition to age in 10 year increments (HR = 1.58, p < 0.001) receipt of blood products during surgery or hospital stay was a significant predictor of poorer survival (HR = 3.41, p < 0.001) after adjustment for other clinical factors.
CONCLUSIONS: In patients with an uneventful cardiac surgery, age was a robust predictor for perioperative blood product transfusion. Transfusions were significantly associated with increases in post-operative morbidity and mortality. In fact, receipt of blood products was a strong predictor for survival independent of increasing age. Continued study into the effects of transfusion, particularly in the elderly, should direct hospital transfusion protocols to ensure optimization of perioperative care.

<table>
<thead>
<tr>
<th></th>
<th>Intraoperative</th>
<th>Postoperative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RBC</td>
<td>Non RBC</td>
</tr>
<tr>
<td>Any Complications</td>
<td>1.48 (&lt;0.001)</td>
<td>1.33 (&lt;0.001)</td>
</tr>
<tr>
<td>Prolonged Ventilation &gt;24hr</td>
<td>2.06 (&lt;0.001)</td>
<td>1.66 (&lt;0.001)</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>1.48 (0.15)</td>
<td>1.34 (0.04)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>1.83 (&lt;0.001)</td>
<td>1.56 (&lt;0.001)</td>
</tr>
<tr>
<td>Operative Mortality</td>
<td>2.34 (&lt;0.001)</td>
<td>1.93 (&lt;0.001)</td>
</tr>
</tbody>
</table>
OBJECTIVES: Ventricular assist devices (VADs) are becoming a standard component for the treatment of patients with advanced heart failure. Implantation can be challenging: patients are often re-operative, have pre-existing coagulopathy due to their congestive hepatopathy and/or renal dysfunction, and are frequently malnourished. These factors combine to make peri-operative hemostasis difficult.

Clotting factor concentrates (rFVIIa, FEIBA, and others) have been utilized to mitigate perioperative bleeding in patients undergoing complex cardiac surgery, including those receiving VADs. We evaluated the use and outcomes of rFVIIa in our VAD patients over a 5 year period.

METHODS: We retrospectively reviewed 123 patients who underwent ventricular assist device placement at our institution between June 2008 and January 2013. 32 patients were identified as having received recombinant activated factor VII (rFVIIa) for refractory bleeding. Clotting concentrates were administered either in the operating room or after arrival in the ICU. Patients receiving rFVIIa were compared with the 80 patients who did not receive any clotting factors concentrates and 10 patients receiving FEIBA (8.1%).

RESULTS: Thirty-two (26%) patients received rFVIIa. Twenty-six of these patients received rFVIIa during their initial procedure, 4 received rFVIIa in the ICU postoperatively, and 3 received rFVIIa upon return to the operating room within 24 hours of the initial procedure. Five of the 32 patients receiving rFVIIa (15.6%) had thrombotic events within the first postoperative week including: right internal jugular vein, left subclavian and internal jugular vein, right upper extremity, right side embolic stroke, and an ischemic/hemorrhagic stroke. None of the control patients (N = 80) had thrombotic events during the first week following their VAD placement. Ten patients (8.1%) received FEIBA and one of these patients (1.0%) had a lower extremity DVT.

* WTSA Member
CONCLUSIONS: Recombinant factor VIIa is associated with a significant risk of thrombotic complications when used to treat perioperative hemorrhage during VAD implantation. Utilization of rFVIIa for the treatment of refractory bleeding and coagulopathy in this setting should be carefully weighed against the thrombotic complication potential. Additionally, recent work from our institute suggests that FEIBA may be a safer alternative to rFVIIa. Further investigation comparing factor concentrates and other agents will be required to determine the strategy that yields the optimal therapeutic balance between surgical hemostasis and complications related to intravascular thrombosis.
OBJECTIVE: Donor lung acceptability is currently based on expert consensus and single institution studies, and contemporary practice patterns show significant variation. We undertook the current study to determine whether donor characteristics influenced disease specific survival.

METHODS: De-identified data were supplied by the United Network for Organ Sharing/Organ Procurement and Transplantation Network (UNOS/OPTN). There were 23,858 lung transplant donors with usable data in the UNOS/OPTN database, Table 1. Multiple imputation involving all non-redundant variables was performed in order to avoid listwise deletion. Patients were separated by diagnosis group. Univariate and multivariate time-varying Cox proportional hazards regression assessed the effect of lung donor characteristics on post-transplantation survival for each diagnosis group. After determining appropriate variables including a size-match variable, multivariate Cox proportional hazards regression was used to create a risk model. Size-match varied across diagnosis groups. Kaplan-Meier survival analysis was used to evaluate whether the risk score accurately predicted post-transplantation survival.

RESULTS: Factors influencing post-transplantation survival varied across diagnosis groups, Table 2. Surprisingly, traditional contraindications to lung donation had limited effect on post-transplant survival including P:F ratio. Acceptable size-match and the effect of oversizing differed among diagnosis groups. Multivariate proportional hazards regression was performed including age >60, age 50–60, diabetes, smoking history, cause of death, donor-to-recipient (D:R) gender mismatch, D:R race mismatch, D:R undersizing, ABO-compatibility, PRA >10%. Hazard ratios were used to establish a risk score, Table 3. Stratifying by lung donor risk score, statistically significant differences in survival were revealed. Comparing lung donor risk score <20 vs. lung donor risk score ≥ 40, survival was better with a lower score: 83% vs. 76% at 1-year and 53% vs. 43% at 5-years, Figure 1.

* WTSA Member
### Table 1.

<table>
<thead>
<tr>
<th>Non-Missing Data (n = 23,858)</th>
<th>Group A (n = 9,915)</th>
<th>Group B (n = 1,073)</th>
<th>Group C (n = 2,785)</th>
<th>Group D (n = 10,085)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Donor Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age &gt;60</strong></td>
<td>23,858</td>
<td>482 (2.0%)</td>
<td>207 (2.1%)</td>
<td>15 (1.4%)</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>23,858</td>
<td>14,667 (61.5%)</td>
<td>6,634 (66.9%)</td>
<td>585 (54.5%)</td>
</tr>
<tr>
<td><strong>African American Race</strong></td>
<td>23,858</td>
<td>3,957 (16.6%)</td>
<td>1,564 (15.8%)</td>
<td>160 (14.9%)</td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td>21,772</td>
<td>1,058 (4.9%)</td>
<td>432 (4.8%)</td>
<td>33 (3.9%)</td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td>21,648</td>
<td>4,145 (19.2%)</td>
<td>1,959 (22.1%)</td>
<td>197 (23.1%)</td>
</tr>
<tr>
<td><strong>PO2:FiO2 ratio</strong></td>
<td>17,252</td>
<td>442.3 ± 110.2</td>
<td>440.8 ± 110.6</td>
<td>445.9 ± 113.4</td>
</tr>
<tr>
<td><strong>PO2:FiO2 ratio &lt;250</strong></td>
<td>17,252</td>
<td>875 (5.1%)</td>
<td>364 (5.5%)</td>
<td>27 (4.8%)</td>
</tr>
<tr>
<td><strong>Cause of death: Anoxia</strong></td>
<td>22,437</td>
<td>2,119 (9.4%)</td>
<td>770 (8.3%)</td>
<td>88 (9.1%)</td>
</tr>
<tr>
<td><strong>Gender Match</strong></td>
<td>23,858</td>
<td>16,053 (67.3%)</td>
<td>6,753 (68.1%)</td>
<td>685 (63.8%)</td>
</tr>
<tr>
<td><strong>Race Match</strong></td>
<td>23,858</td>
<td>15,158 (63.5%)</td>
<td>6,719 (67.8%)</td>
<td>679 (63.3%)</td>
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<tr>
<td><strong>D:R pTLC ratio &gt;1.1</strong></td>
<td>22,454</td>
<td>7,790 (34.7%)</td>
<td>4,115 (44.7%)</td>
<td>355 (38.1%)</td>
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<tr>
<td><strong>D:R pTLC ratio 0.8–1.2</strong></td>
<td>22,454</td>
<td>16,036 (71.4%)</td>
<td>6,392 (69.4%)</td>
<td>645 (69.1%)</td>
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<tr>
<td><strong>ABO match compatible</strong></td>
<td>23,858</td>
<td>2,072 (8.7%)</td>
<td>912 (9.2%)</td>
<td>96 (9.0%)</td>
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<td><strong>HLA mismatch total</strong></td>
<td>20,159</td>
<td>4.6 ± 1.1</td>
<td>4.6 ± 1.1</td>
<td>4.6 ± 1.1</td>
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<tr>
<td><strong>PRA high (&gt;10)</strong></td>
<td>21,959</td>
<td>2,183 (9.9%)</td>
<td>766 (8.4%)</td>
<td>116 (11.8%)</td>
</tr>
<tr>
<td></td>
<td>COPD</td>
<td></td>
<td>IPAH</td>
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<td>-----------------</td>
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<tr>
<td>Age &gt;60</td>
<td>1.23</td>
<td>0.03</td>
<td>1.92</td>
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<td>African</td>
<td>1.12</td>
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<td>0.02</td>
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<td>PO2:FIO2 ratio</td>
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<td>Cause: Anoxia</td>
<td>0.96</td>
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<td>0.48</td>
<td>0.70</td>
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<tr>
<td>Gender Match</td>
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<td>0.60</td>
<td>0.19</td>
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<tr>
<td>Race Match</td>
<td>0.90</td>
<td></td>
<td>0.90</td>
<td>0.21</td>
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<tr>
<td>pTLC &gt;110%</td>
<td>0.96</td>
<td></td>
<td>0.16</td>
<td>0.76</td>
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<td>pTLC &lt;90%</td>
<td>1.09</td>
<td>0.04</td>
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<td>ABO-match</td>
<td>1.07</td>
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<td>Complete HLA</td>
<td>1.10</td>
<td>0.007</td>
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<td>0.004</td>
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<tr>
<td>Points</td>
<td>Description</td>
<td>HR (95% CI)</td>
<td>P-Value</td>
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<td>-------------</td>
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<td></td>
</tr>
<tr>
<td>27</td>
<td>Age &gt;60</td>
<td>1.27 (1.12, 1.45)</td>
<td>&lt;0.001</td>
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<tr>
<td>7</td>
<td>Age 50–60</td>
<td>1.07 (1.01, 1.45)</td>
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<tr>
<td>12</td>
<td>Diabetes</td>
<td>1.12 (1.02–1.23)</td>
<td>0.02</td>
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<tr>
<td>12</td>
<td>Donor smoking history</td>
<td>1.12 (1.07–1.17)</td>
<td>&lt;0.001</td>
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<tr>
<td>13</td>
<td>Cause of death other than anoxia</td>
<td>1.13 (1.05–1.21)</td>
<td>0.001</td>
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<tr>
<td>9</td>
<td>Non-matched donor/recipient gender (in diagnosis groups “B” and “C”)</td>
<td>1.09 (0.99–1.20)</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Non-matched donor/recipient race</td>
<td>1.12 (1.02–1.23)</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Undersized lung (pTLC &lt; 90%) (in diagnosis groups “A”, “C”, and “D”)</td>
<td>1.07 (1.02–1.12)</td>
<td>0.008</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>ABO match compatible but not complete</td>
<td>1.13 (1.06–1.20)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Complete (6/6) HLA mismatch</td>
<td>1.07 (1.02–1.12)</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>PRA &gt; 10%</td>
<td>1.10 (1.03–1.18)</td>
<td>0.005</td>
<td></td>
</tr>
</tbody>
</table>
CONCLUSION: Donor characteristics influence post-transplant survival independent of recipient clinical status, and traditional donor acceptability guidelines may be outdated resulting in limitation of the organ pool. Lung donor acceptability is influenced partly by recipient disease process, and factoring this information into a donor risk score effectively predicts post-transplantation survival. By revising the guidelines for organ acceptance, it may be possible to increase donor utilization while simultaneously improving post-transplantation survival.
OBJECTIVES: Metastatic disease is the major cause of cancer death. In order to metastasize, lung cancer cells must evolve into an invasive and motile phenotype. C-terminal tensin-like (CTEN) is localized to the cytoplasmic tails of focal adhesions and increased expression induces cell motility and invasion in colorectal, breast, and pancreatic cells in vitro. Elevated CTEN expression correlated with higher tumor stage and poorer prognosis in human tissue tumor samples of lung cancer. The regulators of CTEN expression and its role in invasion have not yet been evaluated in lung cancer. We hypothesize that CTEN is a mediator of lung cancer cell invasion and is up-regulated by epidermal growth factor (EGF) via signal transducer and activator of transcription 3 (STAT3).

METHODS: Human non-small cell lung cancer cell lines H125, H358 and H441 were treated with EGF (20 ng/ml) over a time course to evaluate CTEN and STAT3 activation. Cells were then treated with increasing concentrations of highly specific STAT3 inhibitor, S3I-201, to evaluate the effect on EGF-induced CTEN expression. Protein expression of CTEN was evaluated by western blot using GAPDH as a loading control. A549 cells were transduced with short hairpin RNA via lentiviral vector to knockdown expression of CTEN. Matrigel transwell invasion assay was used to determine the effects of CTEN knockdown on cell invasion capabilities. n = 3 for all experiments.

RESULTS: Stimulation of lung cancer cells with EGF induced a peak expression of CTEN at 48 hrs in all cell lines. EGF treatment also induced STAT3 activation. STAT3 inhibition significantly reduced EGF-induced expression of CTEN in H125 (p < .0001), H358 (p = .006) and H441 (p = .014) cells in a dose dependent manner (Figure 1). shRNA knockdown of CTEN resulted in a 65% decrease in cellular invasion by transwell invasion assay (p = .0007) (Figure 2A). Reduction of CTEN expression after shRNA transduction was confirmed over multiple passages by western blot (p < .0001) (Figure 2B).
CONCLUSIONS: CTEN expression mediates invasion of non-small cell lung cancer cells, and CTEN expression is up-regulated by EGF through the STAT3 pathway. These are the first findings in lung cancer to demonstrate mechanisms regulating CTEN expression and its role in invasion. CTEN is a potential therapeutic target for preventing lung cancer metastasis.
**CF11. Clinically Staged N0-1 Esophageal Adenocarcinoma: Actual Pathologic Lymph Node Status and Survival After Primary Esophagectomy**

*Stephanie G. Worrell, *Steven R. DeMeester, Christina L. Greene, Daniel S. Oh, Jeffrey A. Hagen

*University of Southern California, Los Angeles, CA*

**OBJECTIVES:** In patients with esophageal adenocarcinoma clinically staged to have limited nodal disease (N0-1), primary surgical resection may be a reasonable option. This approach requires reliable clinical staging. The aim of this study was to determine the accuracy of clinical staging in patients with esophageal adenocarcinoma thought to have limited locoregional disease and to assess survival with surgical resection alone.

**METHODS:** A retrospective chart review was performed of all patients who had primary esophagectomy for clinical stage T1-3 N0-1 (7th edition AJCC) adenocarcinoma from January 2002 to April 2012. Staging in all patients included endoscopic ultrasound and CT-PET scan. Clinical and pathologic stages were compared, predictors of lymph node involvement were evaluated, and overall survival was analyzed.

**RESULTS:** There were 88 patients that met inclusion criteria. Esophagectomy was open or minimally invasive trans-thoracic en bloc in 65, transhiatal in 9, and vagal sparing in 14 patients. The median number of resected nodes was 47. Median follow-up was 67 months. Clinical staging was confirmed to correctly identify those with ≤T3N1 disease by final pathology in 76% of patients. The 5 year survival in these correctly staged patients was 74% (Table). Understaging was exclusively on the basis of N status and was uncommon in patients with cT1–2 tumors. Patients with cT3 tumors were understaged 44% of the time. Additional factors associated with understaging were presence of dysphagia, tumor length >3 cm, and poor differentiation. When all four factors were present 9/10 patients were understaged.
CONCLUSIONS: Clinical staging with CT-PET and EUS will accurately identify the majority of patients with limited locoregional disease (≤pT3N1). Survival with surgery alone in those correctly staged was excellent and unlikely to be improved with neoadjuvant therapy. A combination of dysphagia, cT3 disease, poor differentiation, and tumor length >3 cm was associated with understaging in 90% of patients. This group of patients may benefit from neoadjuvant therapy prior to resection.
OBJECTIVE: Diaphragmatic herniation (DH) following minimally invasive esophagectomy (MIE) is an infrequent but potentially underestimated significant complication. A single institution case series and review of published literature reporting post-MIE DH is presented.

METHODS: A retrospective review of 120 patients having undergone MIE at a single institution from November 2006-January 2013 was performed. Cross-sectional imaging and clinical records were reviewed for evidence of DH and results reported. Additionally, a systematic literature search on DH postesophagectomy with focus on MIE was conducted and reviewed.

RESULTS: In total, 120 consecutive patients underwent MIE at our institution. The mean age was 65 years (range 27–88 years) and 85% were male. Seven patients (5.8%) were diagnosed with DH postoperative by radiographic imaging with 5 (71.4%) requiring surgical intervention. Diagnosis of DH was made at a median time of 3.4 months (range, 1–45 months) after MIE. Reoperation for recurrence was required in one patient. There were no related mortalities.

Selected for review were 11 studies from a systematic literary search that documented 4,669 in all esophagectomies, of which 756 were MIE. The total number of DH observed in all esophagectomy patients was 121 (2.6%) versus 34 (4.5%) in MIE alone. Among the studies that looked at open esophagectomy alone, the median incidence of DH is reported to be 2.5% (range, 0.69%-4%) The median incidence of DH in MIE was 5.5% (range; 2.8%-26%). A summary of findings from the papers is presented in the attached Table.

The definition and investigation of DH varied widely among authors, with some reporting DH only when surgery was required and others basing DH presence upon vigorous radiographic evaluation. Techniques of resection and the management of the crura also varied, not only between reporting institutions but also within institutions among surgical techniques. The variability of techniques and investigation of DH made analysis limited.
<table>
<thead>
<tr>
<th>Publication</th>
<th>Type of Esophagectomy</th>
<th>Total No. of Patients</th>
<th>Incidence of Diaphragmatic Hernia (%)</th>
<th>Median Time Interval from Surgery to Diagnosis of Diaphragmatic Hernia (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ganeshan et al. 2013</td>
<td>Ivor Lewis</td>
<td>440</td>
<td>10% (44/440)</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Transhiatal</td>
<td>105</td>
<td>6.7% (18/267)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Field/McKeown</td>
<td>38</td>
<td>7.9% (3/38)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MIE</td>
<td>30</td>
<td>6.6% (2/30)</td>
<td></td>
</tr>
<tr>
<td>Willer et al. 2012</td>
<td>IVOR LEWIS</td>
<td>39</td>
<td>12.8% (5/39)</td>
<td>13.8</td>
</tr>
<tr>
<td></td>
<td>MIE</td>
<td>19</td>
<td>26% (5/19)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TTE</td>
<td>20</td>
<td>0% (0/20)</td>
<td></td>
</tr>
<tr>
<td>Price et al. 2011</td>
<td>IVOR LEWIS</td>
<td>2182</td>
<td>0.69% (15/2182)</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Transhiatal</td>
<td>978</td>
<td>0.9% (9/978)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Substernal Colon Interposition</td>
<td>1</td>
<td>100% (1/1)</td>
<td></td>
</tr>
<tr>
<td>Sutherland et al. 2010</td>
<td>Transhiatal Robotic Assisted</td>
<td>36</td>
<td>19.4% (7/36)</td>
<td>3</td>
</tr>
<tr>
<td>Kent et al. 2008</td>
<td>Open</td>
<td>1075</td>
<td>1.86% (24/1075)</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>MIE</td>
<td>494</td>
<td>0.8% (8/494)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TTE</td>
<td>581</td>
<td>2.8% (16/581)</td>
<td></td>
</tr>
<tr>
<td>Vallbohmer et al. 2007</td>
<td>TTE</td>
<td>335</td>
<td>2.5% (9/335)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>LG + TTE (laparoscopic gastrolysis and delayed transthoracic esophagectomy)</td>
<td>187</td>
<td>2.7% (5/187)</td>
<td></td>
</tr>
<tr>
<td>Fumagalli et al. 2006</td>
<td>MIE</td>
<td>44</td>
<td>4.5% (2/44)</td>
<td>NR</td>
</tr>
</tbody>
</table>

*Continued*
<table>
<thead>
<tr>
<th>Publication</th>
<th>Type of Esophagectomy</th>
<th>Total No. of Patients</th>
<th>Incidence of Diaphragmatic Hernia (%)</th>
<th>Median Time Interval from Surgery to Diagnosis of Diaphragmatic Hernia (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caputo et al. 2005</td>
<td>Laparoscopic Gastroplasty + Open Esophagectomy</td>
<td>71</td>
<td>2.8% (2/71)</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45</td>
<td>4.4% (2/45)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Open Gastric Mobilization + Open Esophagectomy</td>
<td>26</td>
<td>0% (0/26)</td>
<td></td>
</tr>
<tr>
<td>Nguyen et al. 2002</td>
<td>MIE</td>
<td>46</td>
<td>4.3% (2/46)</td>
<td>1</td>
</tr>
<tr>
<td>Heitmiller et al. 1997</td>
<td>Transhiatal</td>
<td>183</td>
<td>1.1% (2/183)</td>
<td>1</td>
</tr>
<tr>
<td>Van Sandick et al. 1999</td>
<td>Open</td>
<td>218</td>
<td>4% (9/218)</td>
<td>12</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Postesophagectomy DH is a significant complication that may occur with a higher incidence after minimally invasive esophagectomy when compared to traditional, open esophagectomy. Rigorous evaluation and technique standardization is necessary to identify the true risks among the different techniques of esophagectomy. Future research focusing on long-term results of MIE, such as diaphragmatic hernia, is essential to advancement of knowledge within the field.
OBJECTIVE: There is an established association between obesity and cancer, particularly for patients diagnosed with esophageal adenocarcinoma (EAC). Adipokines, are bioactive proteins secreted by adipose tissue that have been linked to several disease states and have been implicated in the development of cancer. In the obese, higher levels of adipokine production leads to low-level systemic inflammation. We hypothesize that adipokines are associated with an increased rate of growth of esophageal carcinoma and have the potential to serve as both biomarkers of disease and targets for treatment.

METHODS: To investigate the effects of endogenous adipokines on the growth of EAC tumors two populations of severe combined immune-deficient (SCID) mice were given either a high-fat (HFD, 60% fat) or control-diet (CD, 10% fat). Mouse weights were measured weekly. EAC cells (OE-33) were implanted in the flanks of all mice after six weeks on diet. Palpable tumors were observed two weeks later and growth measurements were taken along with mouse weight for an additional twelve weeks. Proteome Profiler adipokine arrays were completed using blood serum and visceral fat pads collected from all mice to evaluate levels of adipokine production. Given the known inflammatory effects of adipokines, COX-2 was evaluated by immunohistochemistry performed on tumors from both groups of mice.

RESULTS: Mice fed the HFD gained over 150% their initial weight over the course of the study, while the CD fed mice maintained their initial weight. (Figure 1) OE33 EAC cells implanted into SCID mice formed tumors in all mice. Tumors in mice fed a HFD displayed a markedly increased rate of growth compared to tumors in mice fed the normal diet. (Figure 2) Elevated production of several adipokines was observed, including resistin, adiponectin, lipocalin-2 and FGF-acidic. (Figure 3) Protein levels of COX-2 were also observed to be more highly expressed in the HFD mice.

* WTSA Member
Figure 1 – Body weight increases as a result of additional fat consumption. HFD fed mice gained an average of 150% of their initial weight, while CD fed mice lost a small amount of their initial weight and then maintained this level throughout the study. The diamond represents date of tumor implant.

Figure 2 – A HFD increases the growth of EAC xenografts. Tumor sizes in HFD fed mice were more than 2.3 times the size of those in the CD fed mice after eight weeks of growth.
CONCLUSION: Elevated adipokine expression levels relate directly to weight gain resulting from a higher percentage of dietary fat consumption. Our data further suggest that these adipokines may play a role in the growth of EAC tumors. As many of these adipokines are pro-inflammatory, obese patients with EAC may benefit from therapeutic approaches that decrease inflammation. Expression of these specific adipokines can be quantitated, providing an opportunity to evaluate these as biomarkers and therapeutic targets.

**Figure 3** – A high fat diet increases the production of several bioactive adipokines. A Proteome Profiler assay reveals significantly higher production of several adipokines in the HFD fed mice as compared to the CD fed mice. Densitometry was performed in replicate and normalized to array controls.

NYU School of Medicine, New York, NY

BACKGROUND: Recurrence following complete resection of stage I adenocarcinoma of the lung remains unacceptably high. Indicators of tumor biology that can predict more aggressive disease are required for the selective application of adjuvant therapies. Osteopontin (OPN) is a secreted protein from malignant cells and regulator of malignant function in non-small cell lung cancer. Plasma OPN correlates with disease stage and with prognosis in advanced disease. We hypothesize that pre-operative plasma OPN is predictive of progression and cancer-specific survival in resected stage I adenocarcinoma.

METHODS: Patients with completely resected stage I adenocarcinoma with tumors <4 cm and without use of adjuvant or neoadjuvant therapy were selected from a prospectively collected research cohort. Demographics, operative variables, pathologic characteristics, and time to progression and death were recorded. Pre-operative plasma OPN was measured by ELISA, and reported in ng/ml. Optimal cut points for recurrence and survival were determined by X-tile plots.

RESULTS: The cohort contains 138 patients (40M/98F). Median follow-up was 53.8 months and was complete in all to 3 years or progression. Twenty-five patients (18%) recurred by 3 years and 22 (16%) died from lung cancer at 5 years. Median OPN was 53.9 (range, 5.8–82.6). OPN levels correlated with age (r = 0.29, p = 0.001) but not with tumor size or pack years. Median OPN was higher in males (69.1 vs. 47.7, p < 0.001) but did not vary with smoking status, T-stage, presence of lymphovascular invasion (LVI) or pleural invasion (PI). In univariate and multivariate analysis pre-operative plasma OPN >49.6, male sex, T2 stage, and LVI independently predicted 3-year recurrence. Similarly OPN >63.3, age >70, T2 stage, and LVI were each independent predictors of 5-year lung cancer mortality (Table).

* WTSA Member
<table>
<thead>
<tr>
<th>Variable</th>
<th>3 Year Progression</th>
<th>5 Year Lung Cancer Death</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Univariate</td>
<td>Multivariate</td>
</tr>
<tr>
<td></td>
<td>HR</td>
<td>95% CI</td>
</tr>
<tr>
<td>OPN &gt;49.6</td>
<td>4.35</td>
<td>2.0–9.5</td>
</tr>
<tr>
<td>OPN &gt;63.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.37</td>
<td>0.2–0.9</td>
</tr>
<tr>
<td>Age &gt;70</td>
<td>1.7</td>
<td>0.8–3.7</td>
</tr>
<tr>
<td>T-stage</td>
<td>3.6</td>
<td>1.4–9.0</td>
</tr>
<tr>
<td>LVI</td>
<td>4.84</td>
<td>1.6–15.0</td>
</tr>
<tr>
<td>PI</td>
<td>2.47</td>
<td>0.9–6.8</td>
</tr>
</tbody>
</table>
CONCLUSION: Circulating OPN provides a view of the tumor micro-environment and indicates disease course in NSCLC. Plasma measurements are easy, inexpensive and reproducible. In this homogeneous cohort with complete follow up we demonstrated that pre-operative OPN carries similar prognostic strength in stage I adenocarcinoma to other recognized markers including sex, T-stage, and LVI. If validated in other cohorts, OPN in combination with these clinical markers may define a novel model to potentially guide the selective use adjuvant therapies.
The St. Regis Monarch Beach, California 40TH ANNUAL MEETING

CF15. Risk Stratification of Prognostic Variables in Patients Undergoing Lung Metastectomy for Soft Tissue and Bone Sarcomas
University of California, Los Angeles, Los Angeles, CA

BACKGROUND: Sarcomas are rare mesenchymal malignancies where the lung represents the most common site of metastasis. While pulmonary metastectomy for sarcoma has been considered standard of care, risk stratification in patients undergoing lung metastectomy is poorly described. We sought to identify prognostic variables in patients that underwent pulmonary metastectomy for soft tissue (STS) or bone sarcomas (BS) to define risk factors that predict disease free survival (DFS) and overall survival (OS).

METHODS: Retrospective review of our prospectively maintained databases revealed 155 patients who underwent pulmonary metastectomy for STS or BS from 1994 to 2010 at a single institution. Log-rank tests, univariate Cox proportional hazard models, Kaplan Meier survival estimates, and an overall multivariate Cox proportional-hazards regression model were applied to identify prognostic factors. We dichotomized each factor into two levels and assessed survival characteristics of the population based on number of negative factors.

RESULTS: Seventy percent were STS (70%; 108/155) and 30% were BS (30%; 47/155). The most common subtype was leiomyosarcoma (19%; 30/155), followed by osteosarcoma (15%; 23/155). Majority of patients received chemotherapy (83%; 128/155). Sixty percent (93/155) received preoperative chemotherapy and 72% (112/155) received adjuvant chemotherapy. OS at 5 years for STS was 37% compared to 53% for BS (p < 0.05). Complete (R0) resection following lung metastectomy was associated with a DFS of 41% vs. 29% for microscopically positive (R1) resection at 1 year (p > 0.05). Completeness of resection did not significantly contribute to 5 year OS. R0 and R1 resections had similar 5 year OS (41% and 46%). Favorable radiographic response to pre-operative chemotherapy was associated with improved DFS at 1 year (40% vs. 12%; p < 0.05) but did not significantly improve OS at 5 years (39% vs. 34%).

*Multivariate analysis of prognostic variables in patients who underwent pulmonary metastectomy for sarcoma revealed that age >45 years, disease free interval of <1 year, thoracotomy (vs. thoracoscopy), synchronous disease, sarcomas other than visceral gynecologic site, STS, and lobectomy were significantly associated with poor survival.

* WTSA Member
Table 1. Number of Prognostic Variables That Predict Overall Survival After Sarcoma Pulmonary Metastectomy

<table>
<thead>
<tr>
<th>Number of Prognostic Variables*</th>
<th>N</th>
<th>1-Year Survival (%)</th>
<th>3-Year Survival (%)</th>
<th>5-Year Survival (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤2</td>
<td>22</td>
<td>91</td>
<td>77</td>
<td>72</td>
</tr>
<tr>
<td>3</td>
<td>55</td>
<td>93</td>
<td>64</td>
<td>54</td>
</tr>
<tr>
<td>4</td>
<td>45</td>
<td>76</td>
<td>38</td>
<td>35</td>
</tr>
<tr>
<td>≥5</td>
<td>33</td>
<td>64</td>
<td>24</td>
<td>8</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Pulmonary metastectomy of STS or BS can achieve long-term survival in selected patients. Risk stratification of variables revealed that presence of at least 5 negative factors was associated with poor survival after metastectomy. Complete resection and microscopic margin positivity following lung metastectomy have similar OS suggesting margin negativity may not be necessary to achieve improved survival. Favorable radiographic response to chemotherapy prior to lung metastectomy is a positive predictor of DFS but not OS.
OBJECTIVES: Surgeon skill and judgement likely increase as experience is gained. Willingness to accept surgical risk may also change with time in career. We evaluated the influence of surgeon experience on outcomes after resection for early-stage NSCLC.

METHODS: Patients undergoing resection for pathologic stage IA NSCLC were selected from a prospectively maintained institutional database. Based on surgeon experience, patients were categorized into low experience (LE, 0–5 years), moderate experience (ME, 6–15 years), high experience (HE, >15 years).

RESULTS: Between 2000 and 2012, 800 patients underwent resection for pathologic stage IA NSCLC [638 (79.8%) lobectomy, 162 (20.2%) sublobar resection]. Of these, 178 (22.2%) were in the LE group, 224 (28.0%) in the ME group, and 398 (49.8%) in the HE group. Patients in the three groups were similar in age, lung function, and comorbidities (Table). The LE surgeons were more likely to perform lobectomies compared to the other two groups [LE: 157/178 (88.2%), ME: 176/224 (78.6%), HE: 305/398 (76.6%), P = 0.005]. Surgeons in the ME group were more likely to perform the operations using VATS [LE: 62/178 (34.8%), ME: 151/224 (67.4%), HE: 133/398 (33.4%), P < 0.001]. The risk of any perioperative morbidity was similar across groups [LE: 54/178 (30.3%), ME: 51/224 (22.8%), HE: 115/398 (28.9%), P = 0.16] as was the distribution of specific complications, length of stay, and risk of surgical mortality. Five-year survival in the ME group was 76.9% compared to 67.5% in the LE group (p < 0.001) and 71.4% in the HE group (p = 0.006).

Of the 638 patients undergoing lobectomy, patient demographics, lung function, and comorbidities were similar across the 3 groups. Patients in the ME group had a lower incidence of prolonged postoperative air leak compared to the other groups, while the remaining perioperative outcomes were similar across groups. Five-year survival in the ME group was 80.7% compared to 70.5% in the LE group (p < 0.001) and 73.6% in the HE group (p = 0.005).

In a Cox proportional hazard model describing the risk of long-term mortality, we considered age, gender, smoking status, coronary artery disease, hypertension, FEV1%, DLCO%, body mass index, prior cancer, surgeon experience, lobectomy versus sublobar resection, and type of incision. Increasing age (HR 1.044, 95%
CI 1.029–1.059), male gender (HR 1.465, 95% CI 1.119–1.918), and prior cancer (HR 1.370, 95% CI 1.057–1.776) were associated with elevated risk of mortality, while being operated on by surgeons in the ME group (HR 0.483, 95% CI 0.315–0.739) was protective.

Table 1. Patient Demographics, Comorbidities, and Postoperative Outcomes for all Resections

<table>
<thead>
<tr>
<th>Variable</th>
<th>LE (n = 178)</th>
<th>ME (n = 224)</th>
<th>HE (n = 398)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years)</td>
<td>64.6 ± 11.4</td>
<td>64.3 ± 10.5</td>
<td>65.5 ±11.4</td>
<td>0.365</td>
</tr>
<tr>
<td>Coronary Artery Disease</td>
<td>40 (22.5%)</td>
<td>34 (15.2%)</td>
<td>81 (20.4%)</td>
<td>0.145</td>
</tr>
<tr>
<td>Peripheral Vascular Disease</td>
<td>10 (5.6%)</td>
<td>7 (3.1%)</td>
<td>18 (4.5%)</td>
<td>0.469</td>
</tr>
<tr>
<td>FEV1 % predicted</td>
<td>79.7 ± 21.1</td>
<td>80.9 ± 19.9</td>
<td>79.3 ± 22.1</td>
<td>0.656</td>
</tr>
<tr>
<td>DLCO % predicted</td>
<td>70.8 ± 21.6</td>
<td>72.7 ± 20.6</td>
<td>71.4 ± 21.6</td>
<td>0.642</td>
</tr>
<tr>
<td>Postoperative Pneumonia</td>
<td>11 (6.2%)</td>
<td>10 (4.5%)</td>
<td>21 (5.3%)</td>
<td>0.745</td>
</tr>
<tr>
<td>Postoperative Dysrhythmia</td>
<td>24 (13.5%)</td>
<td>24 (10.7%)</td>
<td>50 (12.6%)</td>
<td>0.677</td>
</tr>
<tr>
<td>Mean length of hospital stay (days)</td>
<td>6.6 ± 6.3</td>
<td>5.3 ± 4.8</td>
<td>5.8 ± 6.6</td>
<td>0.086</td>
</tr>
<tr>
<td>30 day/hospital mortality</td>
<td>2 (1.1%)</td>
<td>0</td>
<td>6 (1.5%)</td>
<td>0.190</td>
</tr>
</tbody>
</table>

CONCLUSIONS: The experience of the surgeon did not substantially impact perioperative outcomes after resection for pathologic stage I NSCLC. Experience after fellowship may be associated with long-term survival.
OBJECTIVE: Mutations in the major human cardiac motor protein beta-myosin heavy chain (βMHC) have been long recognized as a cause of familial hypertrophic cardiomyopathy. Recently, mutations (P830L and A1004S) in the less abundant (only 10% of total myosin) but faster isoform alpha-myosin heavy chain (αMHC) have been linked to dilated cardiomyopathy (DCM). In the human heart, αMHC is critical for normal cardiac function. In this study, we sought to determine the cellular contractile phenotype associated with these point mutations in human αMHC. We hypothesized that each mutation would result in a calcium-independent decrease in contractility. The study was performed using rat cardiac myocytes in which the myosin isoform expression ratio is reversed (αMHC is the dominant isoform).

METHODS: Ventricular myocytes were isolated from 2 month male Sprague Dawley rats. Cells were cultured in M199 media and infected with adenovirus containing the P830L or the A1004S mutant human αMHC at a MOI of 500 for 18 hours. Uninfected cells (UI) and human βMHC (MOI 500, 18 hours) were used as controls. Cells were loaded with fura-2 (1 μM, 15 min) after 48 hours. Sarcomere shortening and calcium transients were recorded in CO2 buffered M199 media (37º ± 1 C) with and without 10 nM isoproterenol ( Iso) using an IonOptix rig (IonOptix LLC, Milton MA). T-tests were used to test for statistical significance with a P < 0.05 being significant. Data is presented as Mean ± SE.

RESULTS: Both the βMHC and A1004S resulted in a decreased peak sarcomere shortening when compared to the UI and P830L groups (45.0 ± 3.66, 53.6 ± 5.90 vs. 79.0 ± 4.90, 73.5 ± 5.90 nm, P < 0.05). The decreased shortening was associated with a decrease in the departing velocity (−1.48 ± 0.11, −1.44 ± 0.11 vs. −2.25 ± 0.14, −2.14 ± 0.15 nm/ms p < 0.05) respectively. Interestingly, both the P830L and the A1004S increased the peak calcium transient amplitude when compared to the βMHC and UI groups (40.4 ± 2.01, 43.7 ± 1.46 vs. 23.4 ± 1.43, 31.3 ± 1.37 A.U. p < 0.05). Paradoxically, when in the presence of Iso the peak sarcomere shortening of P830L
group was greater than the UI, βMHC, and A1004S groups (151 ± 10.2 vs. 114 ± 6.79, 110 ± 8.24, and 124 ± 11.0 nm p < 0.05). Like the non-Iso group, the increase in peak shortening was associated with an increase in the departing velocity (-4.31 ± 0.30 vs. –3.51 ± 0.22, –3.74 ± 0.30, and –3.70 ± 0.37 nm/ms, P < 0.05). Beguilingly, in Iso, both the P830L and the A1004S increased the peak calcium transient amplitude when compared to the βMHC and UI groups (70.7 ± 3.04, 69.0 ± 2.79 vs. 55.3 ± 2.28, 53.3 ± 2.62 A.U. p < 0.05).

CONCLUSIONS: The P830L and A1004S αMHC mutations while being associated with DCM alter myocyte contractility in completely different ways while at the same time resulting in similar increases in peak calcium release.
**OBJECTIVES:** There are numerous anatomic variants of hypoplastic left heart syndrome. One relatively rare variant includes critical aortic stenosis or atresia, hypoplastic or interrupted aortic arch, but a reasonably well-developed left ventricle due to the presence of a ventricular septal defect. These patients may be candidates for a two-ventricle repair (Yasui procedure) as opposed to a single-ventricle approach (Norwood procedure). The purpose of this study was to evaluate a contemporaneous experience with the Yasui and Norwood procedures at a single institution.

**METHODS:** This was a retrospective review of patients who underwent a Yasui or Norwood procedure at our institution from 2004–2013. Eighteen patients had a Yasui, of whom 15 had a single stage procedure and 3 had a two-staged approach. During this same time frame, 113 patients underwent a Norwood procedure. Kaplan-Meier survival curves and freedom from re-operation were compared.

**RESULTS:** The operative mortality (using STS definition) was 5.5% for the Yasui compared to 16% for the Norwood (p < 0.01). The 1, 3, and 5 year survival rates were 87% vs. 62%, 87% vs. 61%, and 87% vs. 58%, respectively (p < 0.05 by Chi-squared test for all 3 comparisons.) The Kaplan-Meier survival curves for the Yasui and Norwood procedures are shown in Figure 1A.

The average interval between Yasui procedure and need for re-operation was 14.5 months, compared to 4.5 months for the Norwood procedure (p < 0.05). Freedom from re-operation comparing Yasui to Norwood is shown in Figure 1B.

* WTSA Member
CONCLUSIONS: The data demonstrate a significant survival advantage comparing the Yasui to Norwood procedures. In addition, there was a significant difference in need for re-operation. These results indicate that the Yasui procedure has significant long-term benefits compared to the Norwood and should be pursued when the anatomy is amenable for this pathway.
OBJECTIVES: The SVR trial showed better one year transplant free survival for the Sano conduit over the Blalock-Taussig shunt (BT shunt). However, concerns remain about the long-term effects of a neonatal ventriculotomy. In our institution, we have used specific selection criteria for the use of BT shunt in the Norwood procedure and compared this with the Sano conduit.

METHODS: We reviewed 122 consecutive neonates undergoing the Norwood Procedure from December 2006 to December 2013. We used the following criteria to select our source of pulmonary blood flow.

1. Presence of antegrade blood flow in the ascending aorta
2. Presence of morphologic left ventricle
3. Presence of significant large “crossing coronaries” on ventricle
4. Ascending aorta greater than 3 mm
5. Nonrestrictive atrial septum in utero

Patients satisfying the above criteria underwent a BT shunt and the remaining had a Sano conduit.

RESULTS: Seventy-five patients (61.5%) had the Sano conduit and 47 patients (38.5%) had a BT shunt. The mean Aristotle score for the Sano group was 18 and for BT shunt group was 16.5. The overall surgical mortality was 9%. Surgical mortality was 8.5% for the BT shunt group and 9.3% for the Sano group. Mean follow-up interval was 23.5 months. Actuarial transplant free survival was similar at 12, 24, 36 and 48 months in both the BT shunt group and the Sano group. During the follow-up period, 13 patients (10.6%) developed arch obstruction. Eight patients (6.5%) were treated with balloon dilatation without stenting and the remaining five (4%) underwent surgical arch revision.
CONCLUSIONS: The SVR trial showed improved 1 year transplant free survival with the Sano conduit; however this was a multi-institutional study. Given the possible deleterious effects of a neonatal ventriculotomy, the universal use of the Sano conduit should be reconsidered. The criteria mentioned above to select patients for BT shunt, have allowed us to obtain excellent and equivalent transplant free survival at 1 year.
CF20. Pediatric Heart Valve Replacement with Extremely Small Prostheses
Seattle Children’s Hospital, Seattle, WA

OBJECTIVES: Infants and small children who require heart valve replacement often receive prostheses that are <20 mm. Reintervention rates and risk factors for death or reintervention in this cohort of patients are not well established.

METHODS: A single institution, retrospective review was performed of all patients who underwent valve replacement with prostheses ≤20 mm between 1990 and 2013. Univariate and multivariate Cox regression analysis was utilized to identify risk factors for the primary composite outcome of death or valve-related reintervention. Estimates of reintervention free survival were calculated by the Kaplan-Meier method.

RESULTS: Thirty-seven patients (median age = 16.7 months, range 48 days –17 years; median weight = 9.6 kg, range 3.7–81 kg) received thirty-seven valves (mitral = 18, aortic = 14, tricuspid = 2, single ventricle systemic atrioventricular = 2, pulmonic = 1). A bioprosthetic valve was used in 7 (19%) patients and a mechanical valve was used in 29 (78%) patients. One (3%) neonate underwent tricuspid valve replacement with a stented bovine jugular vein valved conduit. Four patients (10.8%) did not survive the index hospitalization. Early mortality after mitral valve replacement was only 5.3%. Four patients (10.8%) required valve reintervention during the index hospitalization, one of whom did not survive to discharge. Sixteen of the remaining 30 patients (53.3%) required valve re-replacement after a median interval of 5.9 years. Median interval to death or reintervention was 331 days for the entire cohort and 2078 days for patients surviving the initial hospitalization (Figure). Multivariate analysis identified valve size ≤17 mm as a risk factor for death or valve replacement in patients surviving the index procedure (p = 0.048). Replacement with an 18–20 mm valve was associated with a 70% decrease in odds of mortality or reintervention when compared to ≤17 mm valves. Anatomic location and valve type (mechanical vs. bioprosthetic) were not associated with poor outcome.

* WTSA Member
CONCLUSIONS: Although reinterventions are common in children who require small valve prostheses, valve replacement is associated with low early mortality, especially in young children who undergo mitral valve replacement. Children who receive a valve that is ≤17 mm are at significantly greater risk of death or re-intervention when compared to children who receive a larger valve. Alternative management strategies, including aggressive attempts at valve repair, should be considered before undertaking valve replacement in high-risk pediatric patients.
OBJECTIVES: The need for a high quality pediatric open heart surgery program in the remote state of Hawaii was identified in early 1994. We identified the medical, programmatic and systematic issues and formulated solutions which led to a successful program. This report documents the evolution as the initial goals were set and then the program was expanded over the 19 year period to allow increased complexity without any increase in patient risk.

METHODS: The entire surgical history of the program was reviewed, including policies which limited the complexity of surgery. The program evolved under the consistent presence of an “expert visiting team” from an established mainland program from California. As the infrastructure improved, patient selection criteria were broadened and development of the pre-selected on-site surgeon remained a focus. Postoperative care was rendered in the PICU supported by the visiting mainland cardiac surgeon and cardiology consultants. Comprehensive management discussions were included in each rounding session and whenever possible, the more complex patients were operated early during the visits to allow for maximal “hands on” input from the consulting team.

RESULTS: The first visiting consultation from the mainland program began in August 1994. Formal policy restructuring in 1995 included a regular “Hawaii Heart Week” program with mainland member visits at approximately 10 week intervals, continuing through 2013. All operations were performed by the same surgeon with the senior visiting surgeon as assistant. Initial patient selection criteria were stringent; only patients with two functional ventricles ≥5.0 kg were accepted during the first 2 years. Eventual broadening led to some single ventricle palliations and selected complex redo operations (Table 1). A contracted mainland perfusion team initially served, followed by the hands-on training of the local perfusionists (during smaller infant and complex surgery). The creation of the Hawaii ECMO program dovetailed with this initiative to provide comprehensive cardiac care. There have so far been 644 open heart repairs done (4 months–18 years) with 1 postoperative death due to pulmonary hypertensive crisis in an infant with a large VSD. Case mix included 131 ASDs, 245 VSDs and 268 more complex operations (Table 1). Outcomes for all diagnoses compare favorably to current STS database standards.

* WTSA Member
The Most Common “Other” Operations in Addition to the 131 ASDs and 245 VSDs

<table>
<thead>
<tr>
<th>Operation</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetralogy of Fallot (complete repair)</td>
<td>47</td>
</tr>
<tr>
<td>Mitral valve surgery (replacement or repair)</td>
<td>40</td>
</tr>
<tr>
<td>Pulmonary valve insertion/conduit change</td>
<td>31</td>
</tr>
<tr>
<td>Atrioventricular canal repair (all types)</td>
<td>23</td>
</tr>
<tr>
<td>Bidirectional Glenn</td>
<td>22</td>
</tr>
<tr>
<td>Aortic AND mitral valve replacement ± Tricuspid valve replacement</td>
<td>21</td>
</tr>
<tr>
<td>Aortic valve replacement (including 3 Ross autographs)</td>
<td>20</td>
</tr>
<tr>
<td>Aortic valve repair AND ventricular septal defect closure</td>
<td>10</td>
</tr>
<tr>
<td>Right ventricular outflow patch</td>
<td>7</td>
</tr>
<tr>
<td>Repair of anomalous venous return</td>
<td>7</td>
</tr>
</tbody>
</table>

CONCLUSIONS: A satellite program in a remote state was created that ultimately allowed state of the art care with outcomes comparable to the best programs in North America. The surgical program growth is ultimately spurring further evolution; interventional cardiology (2004) and electrophysiogy (2005) additions now mean more than 100 pediatric patients/year can get safe cardiac care without the expense and inconvenience of travelling to the mainland United States. Ongoing mainland consultation and visits will continue.
OBJECTIVES: Pulmonary artery band (PAB) is often the first procedure in the multi-stage palliation strategy of single ventricle (SV) patients presenting with unrestricted pulmonary blood flow. Reported operative mortality of PAB has been usually high and its application in SV patients with concomitant arch obstruction has been controversial. We aim to report current era results following initial palliation with PAB in SV patients, including those with arch obstruction.

METHODS: Retrospective review of SV patients who underwent 1st stage palliation with PAB from 2002–2012 was performed. Competing risks analyses were performed to model events after PAB (death, transition to 2nd stage Glenn or transplantation), and subsequently after Glenn (death, transition to 3rd stage Fontan or transplantation) and to examine associated risk factors affecting outcomes.

RESULTS: 70 infants, median age 15 days (range 1–192) underwent 1st stage PAB. Median weight was 3.4 Kg (range 1.5–6.5) with 8 (11%) ≤2.5 Kg. Seven (10%) were premature ≤36 weeks gestation and 9 (13%) had major associated chromosomal or extra-cardiac anomalies. Underlying pathology was double-outlet right ventricle (n = 14,20%), tricuspid atresia (n = 13,19%), double-inlet left ventricle (n = 11,16%), heterotaxy syndrome (n = 11,16%), mitral atresia (n = 8,11%), unbalanced atrioventricular septal defect (n = 8,11%) and other SV anomalies (n = 5,7%). Twenty-seven patients (39%) underwent simultaneous repair of coarctation ± arch hypoplasia.

Thirty day mortality was 2 (3%). Prior to 2nd stage Glenn, 15 patients needed 17 reoperations including PAB adjustments (n = 6), addition of shunt (n = 6), and Norwood-type conversion (n = 5). At time of Glenn, 22 patients had Damus-Kaye-Stansel (DKS) anastomosis.

Competing risks analysis showed that 2 years after PAB, 7% have died, 85% have undergone Glenn, 2% have undergone transplantation, and 6% were alive without Glenn. Competing risks analysis showed that 5 years after Glenn, 7% have died, 78% have undergone Fontan and 15% were alive without Fontan. Overall survival for the entire cohort was 84% at 8 years. Survival was worse for patients who required reoperations prior to Glenn (58% vs. 91%, p = 0.02), who required concomitant total anomalous pulmonary venous connection (TAPVC) repair (33% vs. 88%,
p < 0.0001), those with weight ≤2.5 Kg (63% vs. 87%, \( p = 0.02 \)), with extracardiac or chromosomal anomalies (56% vs. 89%, \( p = 0.006 \)), and with heterotaxy or unbalanced atrioventricular septal defect (68% vs. 95%, \( p = 0.004 \)). Simultaneous arch repair didn’t significantly affect survival (77% vs. 89%, \( p = 0.13 \)). On multivariable analysis, only concomitant TAPVC repair was a risk factor for diminished survival (HR 7.5, \( p = 0.006 \)).

**CONCLUSIONS:** Current outcomes of staged palliation of SV patients starting with 1\textsuperscript{st} stage PAB are good. PAB with simultaneous repair of coarctation/arch hypoplasia is an acceptable management approach allowing deferring DKS till 2\textsuperscript{nd} stage however patients should be carefully selected for this strategy as unplanned reoperation/conversion might be associated with diminished survival. Concomitant TAPVC repair in heterotaxy patients continues to pose a hemodynamic and management challenge. Whether alternative strategies such as TAPVC repair plus shunt provide a more controllable physiologic state remains to be determined.
INTRODUCTION: Aortic root translocation (Nikaidoh procedure) for d-transposition of the great arteries (d-TGA) and pulmonic stenosis (PS) can be achieved with low morbidity, mortality with low late left ventricular outflow tract obstruction (LVOTO). The right ventricular outflow tract (RVOT) is commonly reconstructed with a valved right ventricle to pulmonary artery (RV-PA) conduit, which requires re-operation. We reviewed our experience with the Nikaidoh operation and compare the impact of the use of valved RV-PA conduits vs. non-valved RV-PA connections.

METHODS: The demographic, procedural and outcome data were obtained for 28 patients who underwent aortic root translocation from 1997 to 2013 at our institution. Patients were grouped based on type of RVOT reconstruction, with either a valved RV-PA conduit or a non-valved anastomosis of the PA bifurcation to the RVOT with anterior patch augmentation.

RESULTS: At time of operation, the median age was 6.5 months (16 days-42 years) and weight was 7.7 kg (2.1–48.8 kg). Fundamental diagnoses included d-TGA, VSD/PS (12, 43%), DORV (9, 32%), and congenitally corrected TGA (L-TGA, 5, 18%). There was one early death (non-valved group). There were no late deaths in the median follow-up 32 months (1 month–16.5 years). No patients developed late LV outflow tract obstruction. Twenty-two patients had a valved conduit RVOT reconstruction and 6 patients had a non-valved reconstruction. There were no differences between the groups with respect to age, weight, CPB time, ICU or total length of stay. Eight patients required a reoperation for RV-PA connection revision (7/22 in valved conduit group, 32% vs. 1/6 in non-valved connection, 17%, P = 0.64). On follow up, RV function remained well preserved, based on echocardiogram in all patients irrespective of use of valved or non valved conduit for RVOT reconstruction at the time of aortic root translocation.

CONCLUSIONS: Patients undergoing aortic root translocation have low early and late mortality. There was no LVOTO and preserved aortic valve function on long term. The use of a non-valved RV-PA connection has early outcome comparable to valved RV-PA conduit and at late follow-up had preserved RV function with a trend for fewer late reoperations.
OBJECTIVES: Significant tricuspid valve regurgitation (TR) is considered as a poor prognosis factor for patients with hypoplastic left heart syndrome (HLHS). Infant heart transplantation is advocated for HLHS with TR, but it is not feasible in our country. Performing a tricuspid valve plasty (TVP) during Norwood stage one palliation (S1P) was rarely reported. Here we report our mid-term results of the tricuspid valve plasty (TVP) during Norwood S1P.

METHODS: Between Dec 2004 and July 2013, 48 patients (M:F = 17:31) with HLHS or variants underwent Norwood S1P in our institute. Majority (85%) of the patients received right ventricle to pulmonary artery shunt. The arch reconstruction was performed with selective cerebral perfusion. After arch reconstruction, bypass flow was resumed, and patients (n = 11, 23%) with TR ≥ moderate degree received TVP via right atriotomy with bi-caval cannulation during warming-up. Annuloplasty (n = 8) and posterior leaflet obliteration (n = 3) were the principle techniques used. The endpoint was any mortality and Cox regression analysis was used.

RESULTS: The median age at operation was 4 days and median body weight was 3.0 Kg (range 1.8 to 4.3). The estimated 1-year and 5-year survival rates were 61% and 54%, respectively. Among the 11 patients with TR and received TVP, there were two early mortalities. Nine patients received stage two operation and three late death (two for heart failure, one for renal failure). Three patients completed stage three operation, while three patients were waiting. Using Cox regression analysis, body weight less than 2.5 kg and intact atrial septum were two independent factors associated with mortality. After adjusting these two factors, the patients with significant TR and received TVP in Norwood S1P had a similar survival curve to those without significant TR.
**CONCLUSIONS:** From 9 years of experience, low body weight and intact atrial septum were associated with worse outcome. The negative impact of TR seems neutralized by TVP in Norwood S1P. The result suggested that aggressive TVP is warranted in Norwood S1P; more studies are required to see if the strategy did improve the results for patients with hypoplastic left heart syndrome and TR initially.
16. Dual Anti-Platelet Therapy in Patients with Acute Coronary Syndromes Undergoing CABG: A Meta-Analysis of Randomized Trials
Subodh Verma, Muhammad R. Ahsan, David A. Latter, Hwee Teoh, Jan O. Friedrich
St. Michael’s Hospital, Toronto, ON, Canada
DISCUSSANT: NICHOLAS G. SMEDIRA

OBJECTIVES: Dual anti-platelet therapy (DAPT) with aspirin and a thienopyridine is widely employed in the treatment of patients with acute coronary syndromes (ACS) who are managed either medically or via percutaneous coronary intervention. However, the benefits of ongoing DAPT following CABG surgery in such patients remain unclear. To this aim, we performed a meta-analysis of randomized controlled trials of ACS patients who continued DAPT following CABG, and evaluated all-cause mortality and/or major adverse cardiac events (MACE) as primary outcome measures.

METHODS: We searched Medline, Embase, and the Cochrane Central Register of Controlled Trials from Jan 1, 1990 to March 12, 2013, for studies reported in English. Eligible studies were those which included ACS patients who were randomized to receive DAPT consisting of aspirin along with either a first or second generation thienopyridine (clopidogrel, prasugrel or ticagrelor), and reported outcomes separately in patients who underwent CABG, with a protocol requirement for re-initiation of DAPT following CABG. We used random-effects models to calculate risk ratios (RR) and 95% confidence intervals (CIs) for pooled data. We assessed heterogeneity using I2. We compared all-cause mortality and/or MACE in CABG patients who received less intensive vs. more intensive antiplatelet therapy for a period of 1-year following index ACS and CABG.
RESULTS: Our search identified three eligible large randomized trials including 44,794 patients randomized to less vs. more intensive DAPT. At mean 7–14 month follow-up, CABG patients who received more intensive DAPT had lower MACE (CURE) and/or mortality (TRITON TIMI-38, PLATO) compared to those who did not (RR 0.61, 95% CI 0.37–1.02; p = 0.06; I² = 77%; 3 trials, 3,778 patients). Second generation thienopyridines (prasugrel and ticagrelor) compared to clopidogrel treatment had ~50% lower all-cause mortality in CABG (RR 0.48, 95% CI 0.33–0.69, p = 0.0001; I² = 0%; 2 trials, 1,706 patients) but not in non-CABG (RR 0.90, 95% CI 0.73–1.11, p = 0.34; I² = 66%; 2 trials, 30,526 patients) patients (interaction p = 0.003). There was no difference in rates of stroke in the only trial that reported this data (RR 1.18, 95% CI 0.53–2.62, p = 0.68; 1 trial (PLATO), 1,358 patients). Rates of thrombolysis in myocardial infarction (TIMI) major bleeding were not different (RR 1.02, 95% CI 0.93–1.12, p = 0.62, I² = 0%; 2 trials, 3,333 CABG patients).

CONCLUSIONS: Continuation of DAPT in ACS patients following CABG is associated with a 40% reduction in MACE at 1-year post-CABG surgery. Furthermore, more intense DAPT (with prasugrel or ticagrelor) reduces all-cause mortality by about one-half at 1-year post-CABG surgery. These data strongly suggest that cardiac surgeons should re-initiate DAPT in ACS patients who undergo CABG.
OBJECTIVES: Survival advantage has been observed among patients with malignant pleural mesothelioma (MPM) undergoing maximal cyto-reductive surgery and adjuvant treatment. Elderly patients are considered higher risk for these radical operations and often are not offered surgery. We reviewed our experience with extended pleurectomy and decortication (EPD) among patients age 70 years and older and compared with a cohort of younger patients undergoing the procedure during the same period.

METHODS: We performed a retrospective review of 120 consecutive patients undergoing EPD at a University hospital from January 2008 to December 2013. Patients age of 70 years or older were compared with younger patients for post-operative outcome and survival. Survival was estimated using Kaplan Meier method.

RESULTS: There were 55 patients 70 years and older (Group A) and 65 patients 69 years and younger (Group B) with an age range of 43–89 years old. Older patients had more hypertension (69.1% vs. 46%, p = 0.02) and coronary artery disease (22.6% vs. 6.1%, p = 0.01). Fifty-three percent of patients in group A had a post-operative event as defined in the STS database, compared to 48% of patients in group B (p = NS) Table 1. Air-leak from chest tube persisted beyond 5th post-operative day in 14.8% in Group A and 16.7% in Group B. There were two deaths in each group in hospital or within 30 days of surgery (3.6% vs. 3.1%, p = NS). Median survival for Group A was 18.7 months and for group B was 14 months. Kaplan Meier survival curves based on age groups were not significantly different with one and two year survival 65% vs 56% and 38% vs 30% respectively.
### Post Operative Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Group A</th>
<th>Group B</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>New renal failure</td>
<td>1 (1.8%)</td>
<td>1 (1.5%)</td>
<td>ns</td>
</tr>
<tr>
<td>Chylothorax</td>
<td>1 (1.8%)</td>
<td>3 (4.6%)</td>
<td>ns</td>
</tr>
<tr>
<td>Atrial arrhythmia</td>
<td>11 (20%)</td>
<td>12 (18.5%)</td>
<td>ns</td>
</tr>
<tr>
<td>Ventricular arrhythmia</td>
<td>0 (0%)</td>
<td>1 (1.5%)</td>
<td>ns</td>
</tr>
<tr>
<td>Other CV Event&amp;DVT</td>
<td>0 (0%)</td>
<td>4 (6.2%)</td>
<td>ns</td>
</tr>
<tr>
<td>UTI</td>
<td>0 (0%)</td>
<td>1 (1.5%)</td>
<td>ns</td>
</tr>
<tr>
<td>Delirium</td>
<td>2 (3.6%)</td>
<td>1 (1.5%)</td>
<td>ns</td>
</tr>
<tr>
<td>Pneumonia/atelectasis</td>
<td>1 (1.8%)</td>
<td>1 (1.5%)</td>
<td>ns</td>
</tr>
<tr>
<td>Re-intubation</td>
<td>3 (5.5%)</td>
<td>1 (1.5%)</td>
<td>ns</td>
</tr>
<tr>
<td>Tracheostomy</td>
<td>1 (1.8%)</td>
<td>0 (0%)</td>
<td>ns</td>
</tr>
</tbody>
</table>

### CONCLUSIONS:
Extended pleurectomy and decortication can be offered to patients 70 years of age and older with the same good outcomes as younger patients.

9:50 am – 10:10 am **COFFE BREAK, VISIT EXHIBITS & POSTERS,**
Pacific Ballroom 2-3
OBJECTIVES: Aneurysms and dissections of the descending thoracic aortic represent a complex substrate with a variety of therapeutic options. The introduction of thoracic endovascular repair (TEVAR) has revolutionized the treatment of thoracic aortic disease. However, longitudinal analyses of post-TEVAR outcomes appropriately stratified by disease and operative complexity remain limited.

METHODS: A total of 11,558 patients undergoing TEVAR from 2005–2010 were identified from the Medicare/CMS database. Of the 11,558 patients, 10,903 had a relevant documented aortic pathology (identified by ICD-9 diagnosis codes), 9,341 patients had CPT codes detailing the operation, and 8,812 had both. Patients were stratified by underlying aortic pathology (isolated thoracic aortic aneurysm (TAA), thoracoabdominal aortic aneurysm (TAAA), thoracic aortic aneurysm and abdominal aortic aneurysm (TAA+AAA), acute aortic dissection (AAD), chronic aortic dissection (CAD), aortic rupture, and aortic trauma). The operation was assessed in terms of complexity of endovascular repair, arterial access, need for open cardiac/thoracic aorta/abdominal aorta repair, and concomitant head/neck vessel bypass. Survival was assessed using Kaplan-Meier analysis. Cox proportional hazards analysis determined predictors of survival from TEVAR.

RESULTS: Preoperative and operative variables both for the entire cohort and stratified by diagnosis are shown in Table 1. Median post-operative survival of the entire cohort (n = 11,558) was 4.8 years, with 1-year and 5-year survival estimates of 77% and 49%, respectively. Kaplan-Meier survival curves stratified by diagnosis are shown in Figure 1. Patients suffering from aortic rupture had the worst outcomes of all (median survival 0.8 years, P < 0.001). Interestingly, although the early peri-procedural hazard of TEVAR in AAD and aortic trauma patients was high (1-year survival
73% and 75%, respectively), their late hazard was comparatively low, suggesting that these patients have excellent long-term outcomes if they survive the peri-procedural mortality. On multivariable analysis (Table 2), age, male gender, aortic rupture, concomitant aortic or cardiac open surgical therapy, concomitant peripheral vascular open surgical therapy, and comorbidities including congestive heart failure, chronic kidney disease, and chronic obstructive pulmonary disease were all associated with post-TEVAR death. A less complex aortic pathology (aneurysm limited to the thoracic aorta without associated dissection) was associated with improved post-TEVAR survival.
<table>
<thead>
<tr>
<th></th>
<th>All Pathologies (n = 11,558)</th>
<th>Acute Aortic Dissection (n = 1168)</th>
<th>Chronic Aortic Dissection (n = 1595)</th>
<th>Thoracic Aortic Aneurysm (n = 3653)</th>
<th>Thoraco-Abdominal Aortic Aneurysm (n = 2250)</th>
<th>Thoracic Aortic Aneurysm and Abdominal Aortic Aneurysm (n = 902)</th>
<th>Rupture (n = 1026)</th>
<th>Trauma (n = 309)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at operation</td>
<td>74.3 ± 8.9</td>
<td>72.4 ± 10.3</td>
<td>72.7 ± 9.8</td>
<td>74.6 ± 8.2</td>
<td>75.0 ± 7.6</td>
<td>75.9 ± 6.8</td>
<td>76.9 ± 8.9</td>
<td>70.1 ± 13.0</td>
</tr>
<tr>
<td>Gender (male)</td>
<td>6368 (55.1)</td>
<td>657 (56.3)</td>
<td>864 (52.4)</td>
<td>1991 (54.5)</td>
<td>1218 (54.1)</td>
<td>542 (60.1)</td>
<td>522 (50.9)</td>
<td>178 (57.6)</td>
</tr>
<tr>
<td>Race (caucasian)</td>
<td>9568 (82.8)</td>
<td>877 (75.1)</td>
<td>1236 (77.5)</td>
<td>3074 (84.2)</td>
<td>1944 (86.4)</td>
<td>788 (87.4)</td>
<td>834 (81.3)</td>
<td>260 (84.1)</td>
</tr>
<tr>
<td>Subclavian artery coverage by TEVAR</td>
<td>4185 (36.2)</td>
<td>381 (32.6)</td>
<td>623 (39.1)</td>
<td>1375 (37.6)</td>
<td>744 (33.1)</td>
<td>373 (41.4)</td>
<td>391 (38.1)</td>
<td>138 (44.7)</td>
</tr>
<tr>
<td>Concomitant extension endoprosthesis with TEVAR</td>
<td>1919 (16.6)</td>
<td>136 (11.6)</td>
<td>291 (18.2)</td>
<td>601 (16.5)</td>
<td>454 (20.2)</td>
<td>119 (13.2)</td>
<td>191 (18.6)</td>
<td>29 (9.4)</td>
</tr>
<tr>
<td>Any concomitant endovascular procedure with TEVAR</td>
<td>3260 (28.2)</td>
<td>276 (23.6)</td>
<td>490 (30.7)</td>
<td>995 (27.2)</td>
<td>725 (32.2)</td>
<td>269 (29.8)</td>
<td>299 (29.1)</td>
<td>70 (22.7)</td>
</tr>
<tr>
<td>Complex arterial access</td>
<td>2656 (23.0)</td>
<td>191 (16.4)</td>
<td>360 (22.6)</td>
<td>812 (22.2)</td>
<td>656 (29.2)</td>
<td>222 (24.6)</td>
<td>234 (22.8)</td>
<td>34 (11.0)</td>
</tr>
<tr>
<td>Concomitant cardiac/thoracic/ abdominal aortic operation</td>
<td>1452 (12.6)</td>
<td>183 (15.7)</td>
<td>164 (10.3)</td>
<td>462 (12.6)</td>
<td>349 (15.5)</td>
<td>73 (8.1)</td>
<td>99 (9.6)</td>
<td>11 (3.6)</td>
</tr>
<tr>
<td>Concomitant head/neck vessel bypass</td>
<td>1070 (9.3)</td>
<td>101 (8.6)</td>
<td>217 (13.6)</td>
<td>373 (10.2)</td>
<td>172 (7.6)</td>
<td>78 (8.6)</td>
<td>65 (6.3)</td>
<td>13 (4.2)</td>
</tr>
</tbody>
</table>
### Table 2. Cox Proportional Hazards Analysis of Predictors of Post-Operative Death

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Multivariable Hazard ratio (CI)</th>
<th>P value</th>
<th>Univariable Hazard ratio (CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at surgery</td>
<td>1.029 (1.024–1.033)</td>
<td>&lt;0.001</td>
<td>1.033 (1.028–1.038)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Gender (male)</td>
<td>1.15 (1.07–1.24)</td>
<td>&lt;0.001</td>
<td>1.04 (0.97–1.12)</td>
<td>0.30</td>
</tr>
<tr>
<td>Thoracic aortic aneurysm alone (no dissection, no other aortic pathology)</td>
<td>0.81 (0.75–0.88)</td>
<td>&lt;0.001</td>
<td>0.68 (0.63–0.74)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Aortic rupture</td>
<td>2.62 (2.36–2.90)</td>
<td>&lt;0.001</td>
<td>2.94 (2.66–3.24)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Concomitant cardiac, thoracic aortic, or abdominal aortic operation</td>
<td>1.58 (1.43–1.74)</td>
<td>&lt;0.001</td>
<td>1.27 (1.16–1.40)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Concomitant peripheral vessel operation (including head/neck bypass, lower extremity bypass, etc.)</td>
<td>1.29 (1.20–1.39)</td>
<td>&lt;0.001</td>
<td>1.26 (1.17–1.35)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>1.29 (1.20–1.40)</td>
<td>&lt;0.001</td>
<td>1.65 (1.53–1.77)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>1.26 (1.17–1.36)</td>
<td>&lt;0.001</td>
<td>1.41 (1.31–1.51)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>1.52 (1.40–1.64)</td>
<td>&lt;0.001</td>
<td>1.81 (1.68–1.95)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Post-operative outcomes with TEVAR depend on the complexity of aortic pathology and concomitant procedures required to address the pathology. While aortic rupture is clearly associated with a poor prognosis, a simple initial aortic pathology (isolated TAA without AAD or CAD) is conversely associated with improved outcomes. Long-term outcomes in patients with aortic pathology remain poor, at least in part due to significant associated patient comorbidities.
OBJECTIVES: Del Nido cardioplegia is a non-glucose-based solution given as a single dose that provides up to 180 minutes of cardiac quiescence. The del Nido solution (DNS) has been used safely for nearly two decades at a single center in both pediatric and adult patients. Despite this extensive clinical experience, few published data are available concerning its safety and effectiveness, particularly in adults. We hypothesized that DNS offers equal myocardial protection, decreased hemodilution, and fewer on-pump derangements in blood glucose levels compared with Buckberg cardioplegia (BC).

METHODS: This study was a retrospective review of consecutive adult patients undergoing primary isolated valve operations at a single institution over 3 years. Among patients undergoing aortic valve operations, 129 received DNS and 668 BC. For mitral valve operations, 157 received DNS and 495 BC. DNS was administered exclusively in antegrade fashion.

RESULTS: Compared with those receiving BC, in aortic valve operations with DNS there were significantly smaller changes in pre- to post-bypass hematocrit (−4.97 ± 4.29% vs. −6.93 ± 4.38%, \(P = .04\)), and a significantly lower requirement for blood transfusion (8% vs. 41%, \(P < .001\)). There were also significantly lower elevations in blood glucose levels post-cardiopulmonary bypass in patients receiving DNS compared with BC (12 ± 39 vs. 30 ± 47 mg/dL, \(P = .01\)). No differences were seen in changes in serum potassium (0.03 ± 0.34 vs. −0.03 ± 0.68 mg/dL, \(P = .3\)) or postoperative troponin T (0.23 vs. 0.22 mg/dL, \(P = .9\)) levels.

In patients undergoing mitral valve operations, there were no significant differences in pre- vs. post-bypass hematocrit in those receiving DNS vs. BC (−6.32 ± 3.98% vs. −6.42 ± 4.23%, \(P > .9\)), although patients receiving DNS were less likely to receive blood transfusion (1% vs. 76%, \(P < .001\)). Change in pre- to post-bypass potassium levels was greater in patients given DNS (0.13 ± 0.37 vs. −0.02 ± 0.63 mg/dL, \(P = .04\)); however, no significant difference in pre- to post-bypass blood glucose levels was observed (34.4 ± 54 vs. 34.3 ± 40.3 mg/dL, \(P = .8\)). Postoperative serum troponin T levels were lower in the DNS group (0.39 vs. 0.76 mg/dL, \(P = .05\)).
At our institution, DNS costs approximately 21% less than BC (DNS $28.66/case, BC ~$225/case) in cardioplegia, with additional savings in equipment costs (no need for retrograde cardioplegia catheters). We estimate a $220 savings per open case and $1,190 per robotic case.

**CONCLUSIONS:** Del Nido cardioplegia provides good myocardial protection with decreased risk of blood transfusion and at lower cost than Buckberg cardioplegia in adults undergoing isolated valve operation.
+20. **The Impact of Adjuvant Therapy on Recurrence and Survival Following Primary Esophagectomy for Adenocarcinoma**

**Stephanie Worrell, *Steven R. DeMeester, Christina L. Greene, Daniel S. Oh, Jeffrey A. Hagen**

*University of Southern California, Los Angeles, CA*

**DISCUSSANT: JOSEPH B. SHRAGER**

**OBJECTIVES:** Adjuvant therapy after primary esophagectomy for adenocarcinoma has not been conclusively shown to improve survival. However, its use has not been limited to patients at highest risk for recurrence, those with 3 or more involved lymph nodes. The aim of this study was to assess the impact of adjuvant therapy on the recurrence rate and survival in patients with pathologic N2 or greater nodal disease after primary esophagectomy.

**METHODS:** A retrospective chart review from 9/1989 to 5/2012 was performed to identify all patients that underwent primary esophagectomy for adenocarcinoma and had N2 or N3 disease on final pathology. Patients that received neoadjuvant therapy were excluded. The use and type of adjuvant therapy, when available, was recorded, and the outcome in patients that had adjuvant therapy was compared to those that had follow-up alone after resection.

**RESULTS:** There were 204 patients that met inclusion criteria, of these 92 patients (45%) had adjuvant therapy. The adjuvant therapy group was significantly younger and had more lymph nodes resected at the time of operation (Table). There was no difference in the type of operation between groups. The most common form of adjuvant therapy was chemotherapy alone (75%), and the therapy typically started 3 months post-operatively. Recurrence was documented in 73% of patients after adjuvant therapy compared to 76% of patients with follow-up alone (p = 0.68). The most common type of recurrence was systemic in both groups (59%). The median survival for those that received adjuvant therapy was significantly longer (23 months with adjuvant therapy vs 14 months without, p = 0.0007)[Figure]. On cox regression analysis, adjuvant therapy was the only independent variable that approached significance for survival (p = 0.085, HR 0.73) whereas age, number of nodes resected, type of operation, and time period of operation did not affect survival.

+ Samson Resident Prize Essay

* WTSA Member
**CONCLUSIONS:** The majority of patients with pathologic N2 or greater disease after primary esophagectomy develop recurrent disease and it is typically systemic. Adjuvant therapy improved survival in these patients compared to follow-up alone, and should be offered to those with good performance status. Future studies should focus on the timing, duration and best form of adjuvant therapy for these patients.
11:10 am – 12:00 pm  C. WALTON LILLEHEI
POINT/COUNTERPOINT SESSION

Pacific Ballroom 1
Pay-For Performance Versus Criteria-Based Systems in the US and Canada
Moderator: David A. Fullerton
USA: Jeffrey B. Rich
Canada: Alan H. Menkis

12:00 pm – 12:30 pm  ANNUAL BUSINESS MEETING (Members Only),
Pacific Ballroom 1

12:30 pm – 2:00 pm  FAMILY LUNCHEON, Pacific Lawn

7:00 pm – 11:00 pm  PRESIDENT’S RECEPTION AND BANQUET,
Pacific Ballroom
Black Tie Preferred
CONSTITUTION AND BYLAWS

THE WESTERN THORACIC SURGICAL ASSOCIATION

Founded as The Samson Thoracic Surgical Society

CONSTITUTION

ARTICLE I. NAME
The name of this Corporation is The Western Thoracic Surgical Association (hereinafter “the Association”).

ARTICLE II. CORE VALUES
The core values of the Association shall be:

• Scientific Endeavor in a Collegial Environment;
• Education and Progress;
• The Development of Young Surgeons;
• Professionalism; and
• Family and Friendship.

ARTICLE III. PURPOSES
The purposes of the Association shall be:

To succeed to, and to continue to carry on, the activities formerly conducted by The Samson Thoracic Surgical Society, a corporation.

To associate persons residing in the western United States and Canada who desire to advance the quality and practice of thoracic and cardiovascular surgery as a specialty.

To encourage research and study of thoracic and cardiovascular functions and disorders so as to increase knowledge and improve treatment.

To hold scientific meetings for the presentation and discussion of topics of interest to thoracic and cardiovascular surgeons and to encourage publication to these proceedings.
ARTICLE IV. MEMBERSHIP

Section 1.
The membership of this Association shall consist of surgeons whose principal professional activities are devoted to the practice of thoracic and cardiovascular surgery, and who either fulfill the qualifications specified in Section 4 below or both fulfill the qualifications specified in Section 3 below and who are admitted to membership pursuant to the procedure specified in the By-Laws.

Section 2.
There shall be five types of membership: Active, Senior, Honorary, Charter, and Candidate, as defined in the By-Laws.

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, British Columbia, Manitoba, and Saskatchewan.

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 V. OFFICERS
Section 1.
The officers of the Association shall be a President, a Vice President, a Secretary, a Treasurer, an Editor, and an Historian.

Section 2.
The term of office of the President, Vice President, Secretary and Treasurer shall be one year. The President and Vice President shall not be eligible for re-election. The Secretary and Treasurer shall be eligible for re-election but may serve for no more than four (4) consecutive years. The term of Editor and Historian shall be defined in the By-Laws.

Section 3.
Neither the Secretary nor the Treasurer may serve concurrently as the President.

Section 4.
The Officers shall be elected at the Annual Meeting of the Association in accordance with the procedures set forth in the By-Laws.

ARTICLE VI. COUNCIL
Section 1.
The governing body of the Association shall be the Council and its composition shall be as provided in the By-Laws.
ARTICLE VII. MEETINGS

Section 1.
The Association shall hold Annual Business and regular Scientific Meetings, the time and place to be determined by the Council. Only members of the Association may attend the Business Meetings.

Section 2.
Special meetings of the Council or of the members may be called as provided in the By-Laws.

ARTICLE VIII. 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 for Membership.

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) below.

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 70 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.

Section 4. Candidate Members.
Candidate membership is available to residents who are matched or enrolled in either a cardiothoracic surgery education program accredited by the Residency Review Committee for Thoracic Surgery under the authority of the Accreditation Council for Graduate Medical Education or a program approved for cardiothoracic surgery education by the Royal College of Surgeons of Canada—or their equivalency—from the Association’s geographic limits as defined by the Constitution of the Association. Individuals who have completed their education in one of the above programs and are in the process of acquiring certification in cardiothoracic surgery by either the American Board of Thoracic Surgery or the Royal College of Surgeons of Canada also are eligible to apply for Candidate membership. Candidate members shall have no rights to vote or hold office. Candidate membership shall end when the Candidate becomes eligible for Active membership, at which time s/he is invited to apply for Active membership.
Section 5. Conduct & Discipline.

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.
Section 4. Candidate Members.
Candidate membership is available to residents who are matched or enrolled in either a cardiothoracic surgery education program accredited by the Residency Review Committee for Thoracic Surgery under the authority of the Accreditation Council for Graduate Medical Education or a program approved for cardiothoracic surgery education by the Royal College of Surgeons of Canada—or their equivalency—from the Association’s geographic limits as defined by the Constitution of the Association. Individuals who have completed their education in one of the above programs and are in the process of acquiring certification in cardiothoracic surgery by either the American Board of Thoracic Surgery or the Royal College of Surgeons of Canada also are eligible to apply for Candidate membership. Candidate members shall have no rights to vote or hold office. Candidate membership shall end when the Candidate becomes eligible for Active membership, at which time s/he is invited to apply for Active membership.

ARTICLE III. OFFICERS
Section 1. Nomination and Election.
Candidates for election as Vice President, Secretary, Treasurer and Councilor-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 shall 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, shall 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) Councilors-at-Large, up to (2) Councilors / Founders and ex-officio, without vote, the Historian, Editor, and Representative to the Board of Governors of the American College of Surgeons.

Section 2. Councilors-at-Large.
One Councilor-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 Councilors.
A Councilor shall have no liability based upon any alleged failure to discharge his obligations as a Councilor, except for any self-dealing transaction prohibited by law.

Section 5. Compensation of the Council.
No Councilor shall receive any compensation for serving as a Councilor 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 Councilor 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 Councilor. 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 Councilors 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 Councilors, if any action taken is approved by at least a majority of the required quorum for such meeting.

f. **Adjournment.** A majority of the Councilors 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 Councilors 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 of the Association and the Council shall have no duty to cause any other financial report to be prepared. 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.

The Council may invite guests to attend the meetings of the Association without charge when deemed appropriate and in the interest of carrying out the purposes of the Association.

Section 4. Participation of Guests.
Guests shall be expected to withdraw when the business of the Association is to be conducted, as an announcement by the President.
ARTICLE XI. INDEMNIFICATION
The Association shall indemnify any person, who is or was a Councilor, 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
June 2009
June 2010
June 2012
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 experts’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.
IMPORTANT NOTICE: The previous member listing is proprietary information of the Western Thoracic Surgical Association (“WTSA”) and may not be distributed or duplicated, in whole or in part, for any purpose without the prior written consent of the WTSA. Use of the information for telemarketing or any other solicitation of any persons on this list is strictly prohibited.

NECROLOGY

Samuel J. Camarata, MD, Orange, CA
James M. Guernsey, MD, Martinez, CA
Edward J. Jahnke, MD, Santa Barbara, CA
Fraser M. Keith, MD, Mansfield, OH
Alfred H. F. Lui, MD, Rolling Hills Estates, CA
Donald L. Morton, MD, Santa Monica, CA
J. Karl Poppe, MD, Sedona, AZ
Lloyd W. Rudy, Jr., MD, Spokane, WA
The St. Regis Monarch Beach, California

40TH ANNUAL MEETING

PAST PRESIDENTS

David J. Dugan
1974–1977

Bertrand V. Meyer

John C. Callaghan
1984–1985

Quentin R. Stiles
1988–1989

John E. Connolly
1977–1978

Paul A. Ebert
1981–1982

Richard M. Peters
1985–1986

John R. Benfield
1989–1990

Norman E. Shumway
1978–1979

Robert W. Jamplis
1982–1983

Ivan A. May
1986–1987

Richard P. Anderson
1990–1991

Harold V. Liddle
1979–1980

Arthur N. Thomas
1983–1984

Lucius D. Hill
1987–1988

Richard G. Fosburg
1991–1992

PAST PRESIDENTS
ROSTER

David A. Fullerton
2008-2009

J. Scott Millikan
2009-2010

Robbin G. Cohen
2010-2011

Robert C. Robbins
2011-2012

John C. Chen
2012-2013
THE SAMSON ENDOWMENT/SAMSON WTSA 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.

The Samson Endowment Fund has reached its goal and has now been capped. A new, unrestricted Samson WTSA Fund has been opened, the purpose of which is to help the WTSA achieve its ongoing mission of: associating persons who desire to advance the quality and practice of thoracic and cardiovascular surgery as a specialty; encouraging research and study of thoracic and cardiovascular functions and disorders so as to increase knowledge and improve treatment; and holding scientific meetings for the presentation and discussion of topics of interest to thoracic and cardiovascular surgeons and to encourage publication to these proceedings. It is suggested that each member make a contribution of $500 to the Samson Endowment and WTSA Funds. This may be viewed as a lifetime obligation to be discharged in any manner over any time period the Member chooses. Previous contributions to the now capped Samson Endowment Fund are totaled with any new donations to the Samson WTSA Fund when calculating whether a member has fulfilled his/her suggested lifetime contribution of $500. Contribution is entirely voluntary and 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.
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  
Pebble Beach, California

1997  Edward A. Smeloff  
Sacramento, California

1999  Jack M. Matloff  
Los Angeles, California

2002  Albert Starr  
Portland, Oregon

2004  Leonard L. Bailey  
Loma Linda, California

2005  Bruce A. Reitz  
Stanford, California

2007  W. Gerald Rainer  
Denver, Colorado

2009  Richard P. Anderson  
Seattle, Washington

2010  John A. Hawkins  
Salt Lake City, Utah
2013  Edward D. Verrier  
      Seattle, Washington

2014  Harold C. Urschel, Jr.  
      Dallas, Texas
The Donald B. Doty Educational Award is a $10,000 educational grant with a twofold purpose: 1) to foster innovative educational initiatives in cardiothoracic surgery by WTSA members, and 2) to provide an opportunity for the dissemination of this information to other training centers and academic institutions. The Doty Award has been sponsored by Medtronic since its inception in 2005.

2005 LDS Hospital  
Salt Lake City

2006 James I. Fann  
Stanford, CA

2007 Gordon A. Cohen  
Seattle, WA

2008 John D. Mitchell  
Aurora, CO

2009 Robbin G. Cohen  
Los Angeles, CA

2010 Michael S. Mulligan  
Seattle, WA

2011 Gordon A. Cohen  
Seattle, WA

2012 James I. Fann  
Stanford, CA

2013 Winfield J. Wells  
Los Angeles, California
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
## PAST MEETING HIGHLIGHTS

### 1979  
**Sun Valley Lodge, Sun Valley, Idaho**

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>City</th>
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<tbody>
<tr>
<td>President</td>
<td>Norman E. Shumway</td>
<td>Stanford, California</td>
</tr>
<tr>
<td>Secretary</td>
<td>Arthur N. Thomas</td>
<td>San Francisco, California</td>
</tr>
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<td>Local Arrangements Chairman</td>
<td>Harold V. Liddle</td>
<td>Salt Lake City, Utah</td>
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<td>Samson Resident Prize Essay Award</td>
<td>Thomas H. Hoffmann</td>
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### 1980  
**Tamarron Lodge, Durango, Colorado**

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<tr>
<td>President</td>
<td>Harold V. Liddle</td>
<td>Salt Lake City, Utah</td>
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<tr>
<td>Secretary</td>
<td>Arthur N. Thomas</td>
<td>San Francisco, California</td>
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<tr>
<td>Local Arrangements Chairman</td>
<td>W. Gerald Rainer</td>
<td>Denver, Colorado</td>
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<tr>
<td>Samson Resident Prize Essay Award</td>
<td>Robert H. Breyer</td>
<td>Chicago, Illinois</td>
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### 1981  
**Hyatt Regency Hotel, Maui, Hawaii**

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<tr>
<th>Position</th>
<th>Name</th>
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<tbody>
<tr>
<td>President</td>
<td>Bertrand W. Meyer</td>
<td>Los Angeles, California</td>
</tr>
<tr>
<td>Secretary</td>
<td>Lucius D. Hill</td>
<td>Seattle, Washington</td>
</tr>
<tr>
<td>Local Arrangements Chairman</td>
<td>Quentin R. Stiles</td>
<td>Los Angeles, California</td>
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<tr>
<td>Samson Resident Prize Essay Award</td>
<td>Clifford M. Kitten</td>
<td>San Antonio, Texas</td>
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### 1982  
**Hotel del Coronado, Coronado, California**

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<tr>
<th>Position</th>
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</thead>
<tbody>
<tr>
<td>President</td>
<td>Paul A. Ebert</td>
<td>San Francisco, California</td>
</tr>
<tr>
<td>Secretary</td>
<td>Lucius D. Hill</td>
<td>Seattle, Washington</td>
</tr>
<tr>
<td>Local Arrangements Chairman</td>
<td>Richard G. Fosburg</td>
<td>La Jolla, California</td>
</tr>
<tr>
<td>Samson Resident Prize Essay Award</td>
<td>Douglas A. Murphy</td>
<td>Atlanta, Georgia</td>
</tr>
</tbody>
</table>
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
PAST MEETING HIGHLIGHTS

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
Oakland, 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

<table>
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<tr>
<th>Year</th>
<th>Location</th>
<th>President</th>
<th>Secretary</th>
<th>Local Arrangements Chairman</th>
<th>Samson Resident Prize Essay Award</th>
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<tbody>
<tr>
<td>1992</td>
<td><strong>Hyatt Regency Hotel, Kauai, Hawaii</strong></td>
<td>Richard G. Fosburg, La Jolla, California</td>
<td>D. Craig Miller, Stanford, California</td>
<td>Edward L. Hurley, Sacramento, California Philip W. Wright, Honolulu, Hawaii</td>
<td>Luis J. Castro, Stanford, California</td>
</tr>
<tr>
<td>1993</td>
<td><strong>La Costa Resort, Carlsbad, California</strong></td>
<td>James B.D. Mark, Stanford, California</td>
<td>D. Craig Miller, Stanford, California</td>
<td>Walter B. Cannon, Palo Alto, California</td>
<td>Paul J. Pearson, Rochester, Minnesota</td>
</tr>
<tr>
<td>1994</td>
<td><strong>Resort at Squaw Creek, Olympic Valley, California</strong></td>
<td>Marvin Pomerantz, Denver, Colorado</td>
<td>Kent W. Jones, Salt Lake City, Utah</td>
<td>Daniel L. Smith, Denver, Colorado</td>
<td>Barbara L. Robinson, Rochester, Minnesota</td>
</tr>
</tbody>
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PAST MEETING HIGHLIGHTS

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. Penkoske
                       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
Baiya 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
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<td>2004</td>
<td>Wailea Marriott, Wailea, Maui, Hawaii</td>
<td>Vaughn A. Starnes (Los Angeles, California)</td>
<td>R. Scott Mitchell (Stanford, California)</td>
<td>Winfield J. Wells (Los Angeles, California)</td>
<td>Frederick A. Tibayan (Stanford, California)</td>
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<td>2005</td>
<td>Fairmont Empress Hotel, Victoria, BC, Canada</td>
<td>Steven W. Guyton (Seattle, Washington)</td>
<td>John A. Hawkins (Salt Lake City, Utah)</td>
<td>W. R. Eric Jamieson (Vancouver, BC, Canada)</td>
<td>Matthew G. Whitten (Salt Lake City, Utah)</td>
<td>LDS Hospital (Salt Lake City, Utah)</td>
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<td>2006</td>
<td>Sun Valley Resort, Sun Valley, Idaho</td>
<td>R. Scott Mitchell (Stanford, California)</td>
<td>John A. Hawkins (Salt Lake City, Utah)</td>
<td>Thomas A. Burdon (Stanford, California)</td>
<td>T. Brett Reece (Charlottesville, VA)</td>
<td>James I. Fann (Stanford, California)</td>
<td>John A. Hawkins (Salt Lake City, Utah)</td>
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PAST MEETING HIGHLIGHTS

2007  Hyatt Regency Tamaya Resort & Spa, Santa Ana Pueblo, New Mexico

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, Kona, Hawaii

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

2009  The Fairmont Banff Springs, Banff, Canada

President  David A. Fullerton
Aurora, Colorado

Secretary  Thomas A. Burdon
Palo Alto, California

Local Arrangements Chairman  Michael J. Weyant
Aurora, Colorado

Samson Resident Prize Essay Award  David C. Mauchley
Denver, Colorado

Donald B. Doty Award  Robbin G. Cohen
Los Angeles, California

Norman E. Shumway Award  Anthony D. Caffarelli
Stanford, California
PAST MEETING HIGHLIGHTS

2010  Ojai Valley Inn, Ojai, California
President  J. Scott Millikan  
Billings, Montana
Secretary  Thomas A. Burdon  
Palo Alto, California
Local Arrangements Co-Chairs  Dominic and Carolyn Tedesco  
Ventura, California
Samson Resident Prize Essay Award  Phillip D. Smith  
Aurora, Colorado
Donald B. Doty Award  Michael S. Mulligan  
Seattle, Washington
Norman E. Shumway Award  Phillip D. Smith  
Aurora, Colorado

2011  The Broadmoor, Colorado Springs, Colorado
President  Robbin G. Cohen  
Los Angeles, California
Secretary  Thomas A. Burdon  
Palo Alto, California
Local Arrangements Co-Chairs  David and Christine Fullerton  
Aurora, Colorado
Samson Resident Prize Essay Award  Jessica A. Yu  
Denver, Colorado
Donald B. Doty Award  Gordon A. Cohen  
Seattle, Washington
Norman E. Shumway Award  Agustin E. Rubio  
Seattle, Washington

2012  The Grand Wailea, Maui, Hawaii
President  Robert C. Robbins  
Stanford, California
Secretary  Thomas A. Burdon  
Stanford, California
Local Arrangements Co-Chairs  James and Andrea Fann  
Stanford, California
Samson Resident Prize Essay Award  Ryan Kim  
Saginaw, Michigan
Donald B. Doty Award  James I. Fann  
Stanford, California
Norman E. Shumway Award  Sarah Geisbuesch  
New York, New York
# PAST MEETING HIGHLIGHTS

## 2013  The Coeur d’Alene, Coeur d’Alene, Idaho

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<td>Yong Shin</td>
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<td>Ahmad Y. Sheikh</td>
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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

Dysoxia 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. Buckberg, 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 Mediastinum 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 Coox 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. McKneally, 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
POSTGRADUATE COURSES AND SPEAKERS

1997  What is Wrong with the Failing Heart  
William W. Parmley, MD, San Francisco, CA

1998  The Surgical Treatment of End-Stage Heart Disease by Transplants and Mechanical Devices: Outcomes and Costs  
Keith Reemtsma, MD, New York, New York

1999  The Surgical Profession at the Turn of the Century: Challenges and Opportunities  
Samuel A. Wells, Jr., MD, Chicago, Illinois

2000  The Current Status of Therapy for Thoracic Aneurysms  
Denton A. Cooley, MD, Houston, Texas

2001  Thinking Beyond the Third Dimension  
Marc R. DeLeval, MD, FRCS, London, England

2002  Advances in Aortic Surgery  
Nicholas T. Kouchoukos, MD, FACS, St. Louis, Missouri

Advances in Congenital Heart Disease Surgery  
Frank L. Hanley, MD, San Francisco, California

Advances in Cardiac Valve Surgery  
Robert Karp, MD, Snowmass, Colorado

2003  Cell Transplantation to Prevent Heart Failure  
Richard D. Weisel, MD, Toronto, Ontario Canada

2004  Where, When and How it all Started  
Norman E. Shumway, MD, Stanford California

2005  Progress Toward A Tissue Engineered Heart Valve  
John E. Mayer, Jr., MD, Boston, MA

2006  Stem Cell Research  
Irving Weissman, MD, Stanford, CA

2007  Frontiers in Disease Phenotyping: The Example of Organ Transplantation  
Philip F. Halloran, MD, Edmonton, AB, Canada

2008  Allogeneic Stem Cell Transplantation for Malignant and Nonmalignant Hematologic Disorders  
Rainer F. Storb, MD, Seattle, Washington
POSTGRADUATE COURSES AND SPEAKERS

2009  Cardiac Surgery and Translational Research—A Critical Partnership in Critical Condition  
      Francis G. Spinale, MD, Charleston, South Carolina

2010  The Emerging Science of Healthcare Delivery  
      Nicholas Wolter, MD, Billings, Montana

2011  Why Would Anyone Want to Be on Your Surgical Team?  
      Robert C. Myrtle, Los Angeles, California

2012  Paging Dr. Moore, STAT  
      Arnold Milstein, Stanford, California

2013  Medical Miracles Cost Money  
      Geoffrey Sewell, Honolulu, Hawaii

      How to Be Successful in the Accountable Care Organization (ACO) Movement  
      Francis J. Crosson, Alexandria, Virginia  
      J. Scott Millikan, Billings, Montana  
      Dominic J. Tedesco, Ventura, California
TSFRE IS YOUR FOUNDATION FOR RESEARCH AND EDUCATION... 

The Thoracic Surgery Foundation for Research and Education (TSFRE) was established in 1988 as a 501(c)(3) not-for-profit charitable organization. Representatives from the four leading thoracic surgery societies – the American Association for Thoracic Surgery (AATS), The Society of Thoracic Surgeons (STS), the Southern Thoracic Surgical Association (STSA), and the Western Thoracic Surgical Association (WTSA) serve on the TSFRE Board of Directors, and each organization provides financial support to TSFRE. The Foundation represents all of thoracic surgery in the United States and its research and educational initiatives support the broad spectrum of thoracic surgery.

The mission of TSFRE is to foster the development of surgeon scientists in cardiothoracic surgery; increasing knowledge and innovation to benefit patient care.

For over 25 years, TSFRE has supported over $11 million toward thoracic surgery research and education programs, and has supported over 250 Alley-Sheridan Scholarships.

Your donations to TSFRE have a direct impact on the future of cardiothoracic surgery and the welfare of our patients. Please consider making an annual donation to TSFRE via the following options:

• Donate in person at the TSFRE Booth #T29
• Donate online at http://tsfre.org/donation/
• Donate by mail: TSFRE, 633 North St. Clair Street, 23rd Floor, Chicago, IL 60611

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John S. Ikonomidis, MD, PhD, Chair, TSFRE Research and Education Committee
Priscilla S. Kennedy, Executive Director
2014 TSFRE RESEARCH AND EDUCATION AWARD RECIPIENTS

TSFRE Research Grant: 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 $40,000 a year for up to two years are made each year to support the work of an early-career cardiothoracic surgeon (within five years of first faculty appointment).

Ravi K. Ghanta, MD
University of Virginia
“Therapeutic Mechanical Modification of Myocardial Infarcts with Tunable Nanofibers to Prevent Ventricular Remodeling”

TSFRE/NIH Jointly Sponsored Mentored Clinical Scientist Development Awards (TSFRE/NCI/NHBLI/MCSDA): Support to outstanding clinician research scientists who are committed to a career in cardiothoracic surgery research and have the potential to develop into independent investigators. The award is up to $150,000 in total additional matching funding over the 5 year NIH award period.

Edward Cantu, MD
University of Pennsylvania
“NHLBI K23/Lung Transplant Donor: Prediction, Evaluation, and Mechanism”

TSFRE Nina Starr Braunwald Research Fellowship: Support of up to $30,000 per year for up to two years for a woman resident working in a cardiac surgical clinic or laboratory research program who has not yet completed cardiothoracic surgical training.

Ann C. Gaffey, MD
University of Pennsylvania
“A Novel, Vascularized Clinically Translatable Tissue Engineered Construct to Provide Aniogenic Endothelial Progenitor Cell Therapy to Treat Ischemic Cardiomyopathy”

Emily A. Downs, MD
University of Virginia
“Anisotropic Reinforcement of Acute Right Ventricular Dysfunction”
TSFRE Simulation Award: Support of up to $15,000 for research grants to support demonstration study of the application of simulation for thoracic surgery education.

**Dawn S. Hui, MD**
Saint Louis University
“Defining Nontechnical Predictors and Number of Repetitions to Reach Technical Skill Proficiency on Coronary Anastomosis Simulation Prior to Patient Experience”

Carolyn E. Reed Traveling Fellowship: This annual award of up to $10,000 will allow a clinically established woman thoracic surgeon to travel to another institution for the purpose of learning a new skill or technology.

**Linda W. Martin, MD**
University of Maryland
“Robotic Thoracic Surgery at the University of Alabama at Birmingham”

2014 TSFRE EDUCATION AWARD RECIPIENTS

**TSFRE Alley-Sheridan Recipients:** TSFRE offers up to 10 partial scholarships of $2,500 toward the cost to attend the Leadership Program in Health Policy and Management at the Heller School of Public Policy and Management at Brandeis University, and the Surgeons as Educators Course hosted by the American College of Surgeons.

**Leadership Program in Health Policy and Management** Scholarship Recipients:

1. Faisal Bakaeen, MD
2. Ali Khoynezad, MD, PhD
3. Lucas R. Collazo, MD
4. Richard G. Ohye, MD
5. Cristobal Gerardo Alvarado, MD, FACS
6. Ourania Preventza, MD, FACS
7. Peter I. Tsai, MD, FACS, FCCP
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Theodor J. Fischlein | CF2
Lisa S. Foley | 13, CF4, CF10
Joseph M. Forbess | CF19
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O.H. Frazier | 11
Kirsten A. Freeman | 13, CF4
Jan O. Friedrich | 16
David A. Fullerton | 13, CF4, CF10
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A. Marc Gillinov | 19
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IS YOUR WTSA MEMBERSHIP INFORMATION CURRENT?

DO YOU HAVE:
A new email address for either work 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 reaches you.

(Please Print)

First Name M Last Name Suffix

Email Address

Spouse Name

OFFICE ADDRESS

Institution

Address

City State Zip Country

Office Phone Office Fax

HOME ADDRESS

Address

City State Zip Country

Home Phone Home Fax

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
500 Cummings Center, Suite 4550
Beverly, MA 01915
**WEDNESDAY, June 25, 2014**

1:00 pm – 6:00 pm  | Registration  | Pacific Ballroom Promenade
1:00 pm – 6:00 pm  | Speaker Ready Room  | Sorrento
7:00 pm – 9:00 pm  | New Members/Welcome Reception  | Sunset Terrace
7:00 pm – 9:00 pm  | Kids & Teens Reception (Ages 5-18)  | Mediterranean Room & Terrace

**THURSDAY, June 26, 2014**

6:00 am  | Samson Fun Run  | Start Line: Hotel Group Entrance
7:00 am – 1:30 pm  | Registration  | Pacific Ballroom Promenade
7:00 am – 8:00 am  | Breakfast  | Pacific Ballroom 2-3
7:00 am – 11:00 am  | Family Hospitality**  | Mediterranean Room & Terrace
7:00 am – 12:00 pm  | Exhibits  | Pacific Ballroom 2-3
7:00 am – 12:30 pm  | Speaker Ready Room  | Sorrento
8:00 am – 9:00 am  | Scientific Session I  | Pacific Ballroom 1
9:00 am – 9:05 am  | On the 40th Anniversary of the WTSA  | Pacific Ballroom 1
9:05 am – 9:10 am  | New Member & Samson Prize Finalist Introductions  | Pacific Ballroom 1
9:10 am – 9:55 am  | Presidential Address  | Pacific Ballroom 1
9:55 am – 10:20 am  | Coffee Break, Visit Exhibits & Posters  | Pacific Ballroom 2-3
10:20 am – 11:40 am  | Scientific Session II  | Pacific Ballroom 1
11:40 am – 11:45 am  | David J. Dugan Distinguished Service Award Presentation  | Pacific Ballroom 1
11:45 am – 12:30 pm  | Invited Guest Speaker & Spouse Forum Session  | Pacific Ballroom 1
1:30 pm  | Paddle Boarding Excursion*  | Depart from Hotel Group Entrance
1:30 pm  | Dolphin & Whale Watching Safari*  | Depart from Hotel Group Entrance
6:00 pm – 10:00 pm  | So-Cal Vintage Beach Party Theme Dinner  | Grandlawn North

**FRIDAY, June 27, 2014**

7:00 am – 12:00 pm  | Registration  | Pacific Ballroom Promenade
7:00 am – 8:00 am  | Breakfast  | Pacific Ballroom 2-3
7:00 am – 11:00 am  | Family Hospitality**  | Mediterranean Room & Terrace
7:00 am – 12:00 pm  | Exhibits  | Pacific Ballroom 2-3
7:00 am – 12:00 pm  | Speaker Ready Room  | Sorrento
7:30 am – 9:10 am  | Scientific Session III  | Pacific Ballroom 1
9:10 am – 10:00 am  | Postgraduate Course  | Pacific Ballroom 1
10:00 am – 10:30 am  | Coffee Break, Visit Exhibits & Posters  | Pacific Ballroom 2-3
10:30 am – 11:30 am  | Scientific Session IV  | Pacific Ballroom 1
11:30 am – 12:30 pm  | Catheter-Based Mitral Valve Replacement: What Is It and Is It Possible?  | Pacific Ballroom 1
1:20 pm  | Golf Tournament*  | Monarch Beach Golf Links
2:00 pm  | Tennis Tournament*  | The Tennis Club
Free Evening

**SATURDAY, June 28, 2014**

6:30 am – 12:00 pm  | Registration  | Pacific Ballroom Promenade
6:30 am – 7:30 am  | Breakfast  | Pacific Ballroom 2-3
6:30 am – 10:30 am  | Exhibits  | Pacific Ballroom 2-3
6:30 am – 11:30 am  | Speaker Ready Room  | Sorrento
7:00 am – 11:00 am  | Family Hospitality**  | Mediterranean Room & Terrace
7:00 am – 8:15 am  | Concurrent Forums  | Pacific Ballroom 1
| A) Adult Cardiac Session  | Adriatic
| B) General Thoracic Session  | Aegean
| C) Congenital Heart Disease Session  |
8:30 am – 9:50 am  | Scientific Session V  | Pacific Ballroom 1
9:50 am – 10:10 am  | Coffee Break, Visit Exhibits & Posters  | Pacific Ballroom 2-3
10:10 am – 11:10 am  | Scientific Session VI  | Pacific Ballroom 1
11:10 am – 12:00 pm  | C. Walton Lillehei Point/Counterpoint Session  | Pacific Ballroom 1
12:00 pm – 12:30 pm  | Annual Business Meeting (Members Only)  | Pacific Ballroom 1
12:30 pm – 2:00 pm  | Family Luncheon  | Pacific Lawn
7:00 pm – 10:00 pm  | Kids & Teens Banquet (Ages 5-18)  | Mediterranean Room & Terrace
7:00 pm – 11:00 pm  | President’s Reception & Banquet  | Pacific Ballroom
| Black Tie Preferred  |

*Separate Subscription Required

** For Registered Spouses, Guests, and Children Only