WTSA

VISION
Build the foundation for the next generation of Cardiothoracic Surgeons

MISSION
Educate in a collegial environment

FUTURE MEETINGS

40th ANNUAL MEETING
June 25-28, 2014
The St. Regis Monarch Beach
Dana Point, California

41st ANNUAL MEETING
June 24-27, 2015
Fairmont Chateau Whistler
Whistler, British Columbia, Canada
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* These sections available on-site in Coeur d’Alene, Idaho, or by logging into the Members Only Area of the WTSA Website at [http://members.westernthoracic.org](http://members.westernthoracic.org).
WESTERN THORACIC SURGICAL ASSOCIATION

OFFICERS AND COUNCIL

President
John C. Chen
Honolulu, Hawaii

Vice President
Thomas A. Burdon
Stanford, California

Immediate Past President
Robert C. Robbins
Stanford, California

Secretary
Patricia A. Thistlethwaite
La Jolla, California

Treasurer
Joseph C. Cleveland, Jr.
Aurora, Colorado

Councillors-at-Large
Ross M. Bremner (2013)
Phoenix, Arizona
James I. Fann (2014)
Stanford, California
Mark T. Metzdorff (2015)
Denver, Colorado

Councillor/Founder
Arthur N. Thomas
Hillsborough, California

Historian
Marvin Pomerantz
Aurora, Colorado

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

Editor
Lawrence H. Cohn
Boston, Massachusetts
2012–2013 COMMITTEES

LOCAL ARRANGEMENTS COMMITTEE
Yong Shin, Chair
Daniel L. Serna, Samson Fun Run
Joseph C. Cleveland, Jr., Golf Tournament
Richard I. Whyte, Tennis Tournament

MEMBERSHIP COMMITTEE
Michael J. Weyant, Chair (2014)
Craig J. Baker (2014)
Brian S. Cain (2015)
P. Michael McFadden (2013)
Michael A. Smith (2013)

NOMINATING COMMITTEE
Douglas E. Wood, Chair (2013)
Robbin G. Cohen (2016)
David A. Fullerton (2014)
J. Scott Millikan (2015)
Robert C. Robbins (2017)

PROGRAM COMMITTEE
Paul H. Schipper, Chair (2013)
Michael P. Fischbein (2014)
Sean C. Grondin (2013)
John J. Lamberti (2015)
Brian L. Reemtsen (2014)
Daniel L. Serna (2015)
John C. Chen, Ex-Officio (2013)
Lawrence H. Cohn, Ex-Officio (2013)
Patricia A. Thistlethwaite, Ex-Officio (2013)

PROGRAM SUBCOMMITTEES

Adult Cardiac
Craig H. Selzman (2013)
Howard K. Song (2013)

Congenital Heart
Gordon A. Cohen (2013)
Aditya K. Kaza (2013)

General Thoracic
Steven R. DeMeester (2013)
Jessica Donington (2013)
WESTERN THORACIC SURGICAL ASSOCIATION

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
Douglas E. Wood
Seattle, Washington

Representatives to the Thoracic Surgery Foundation for Research & Education
D. Craig Miller
Stanford, California

R. Scott Mitchell
Stanford, California
## SCHEDULE OF EVENTS

### WEDNESDAY, June 26, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 am – 1:00 pm</td>
<td>Council Meeting</td>
<td>Boardroom 6</td>
</tr>
<tr>
<td>1:00 pm – 6:00 pm</td>
<td>Registration</td>
<td>Conference Center Registration</td>
</tr>
<tr>
<td>1:00 pm – 6:00 pm</td>
<td>Speaker Ready Room</td>
<td>Beauty Bay</td>
</tr>
<tr>
<td>7:00 pm – 9:00 pm</td>
<td>New Members/Welcome Reception</td>
<td>Lakeview Terrace</td>
</tr>
<tr>
<td>7:00 pm – 9:00 pm</td>
<td>Kids &amp; Teens Reception (Ages 3–18)</td>
<td>Front Plaza</td>
</tr>
</tbody>
</table>

### THURSDAY, June 27, 2013

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 am</td>
<td>Samson Fun Run</td>
<td>Start Line: Front Plaza</td>
</tr>
<tr>
<td>7:00 am – 8:00 am</td>
<td>Breakfast</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>7:00 am – 11:00 am</td>
<td>Family Hospitality</td>
<td>Boardroom 5ABC</td>
</tr>
<tr>
<td>7:00 am – 12:00 pm</td>
<td>Exhibits</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>7:00 am – 12:00 pm</td>
<td>Speaker Ready Room</td>
<td>Beauty Bay</td>
</tr>
<tr>
<td>7:00 am – 1:30 pm</td>
<td>Registration</td>
<td>Conference Center Registration</td>
</tr>
<tr>
<td>8:00 am – 9:00 am</td>
<td>Scientific Session I</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>9:00 am – 9:10 am.</td>
<td>New Member &amp; Samson Prize Finalist Introductions</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>9:10 am – 9:55 am</td>
<td>Presidential Address</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>9:55 am – 10:20 am</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>10:00 am – 11:00 am</td>
<td>Spouse Forum Session</td>
<td>Casco Bay</td>
</tr>
<tr>
<td>10:20 am – 11:40 am</td>
<td>Scientific Session II</td>
<td>Bays 1-3</td>
</tr>
</tbody>
</table>
11:40 am – 12:30 pm  
C. Walton Lillehei Point/Counterpoint  
*Bays 1-3

12:30 pm – 5:00 pm  
Whitewater Rafting Excursion*  
*Depart from Hotel Front Entrance

1:30 pm – 4:30 pm  
Historical Tour of Coeur d’Alene*  
*Depart from Hotel Front Entrance

6:00 pm – 10:00 pm  
Lewis & Clark Theme Dinner  
*Hagadone Event Center  
(transportation departs from Boardwalk Marina, east side)

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**FRIDAY, June 28, 2013**

6:00 am – 12:00 pm  
Registration  
*Conference Center Registration*

6:00 am – 12:00 pm  
Speaker Ready Room  
*Beauty Bay*

6:30 am – 7:50 am  
Breakfast Session*  
*Casco Bay & Kidd Island Bay*

7:30 am – 8:00 am  
Breakfast  
*Bays 4-6*

7:00 am – 11:00 am  
Family Hospitality  
*Boardroom 5ABC*

7:30 am – 12:00 pm  
Exhibits  
*Bays 4-6*

8:00 am – 8:40 am  
Postgraduate Course I  
*Bays 1-3*

8:40 am – 9:20 am  
Postgraduate Course II  
*Bays 1-3*

9:20 am – 11:00 am  
Scientific Session III  
*Bays 1-3*

10:00 am  
David J. Dugan Distinguished Service Award Presentation  
*Bays 1-3*

11:00 am – 11:30 am  
Coffee Break, Visit Exhibits & Posters  
*Bays 4-6*

11:30 am – 12:30 pm  
Scientific Session IV  
*Bays 1-3*

* Separate Subscription Required
2:00 pm   Golf Tournament*
           Coeur d’Alene Golf Course
           (transportation departs from Eagle Shuttle Marina, west side, starting at 12:45 pm)
2:00 pm   Tennis Tournament*
           Coeur d’Alene Tennis Courts
           (transportation departs from Eagle Shuttle Marina, west side, starting at 12:45 pm)

Free Evening

SATURDAY, June 29, 2013

6:00 am – 11:30 am  Speaker Ready Room
                    Beauty Bay
6:00 am – 12:00 pm  Registration
                    Conference Center Registration
6:30 am – 7:30 am   Breakfast
                    Bays 4-6
6:30 am – 10:30 am  Exhibits
                    Bays 4-6
7:00 am – 8:15 am   Concurrent Forums
                    A) Adult Cardiac Session
                    Bays 1-3
                    B) General Thoracic Session
                    Casco Bay
                    C) Congenital Heart Disease Session
                    Kidd Island
7:00 am – 11:00 am  Family Hospitality
                    Boardroom 5ABC
8:30 am – 9:50 am   Scientific Session V
                    Bays 1-3
9:50 am – 10:10 am  Coffee Break, Visit Exhibits & Posters
                    Bays 4-6
10:10 am – 11:10 am Scientific Session VI
                    Bays 1-3
11:10 am – 12:00 pm Controversies in Thoracic Surgery
                    Bays 1-3

* Separate Subscription Required
12:00 pm – 12:30 pm  Business Meeting *(Members Only)*  
*Bays 1-3*

12:30 pm – 2:00 pm  Family Luncheon  
*Lakeview Terrace*

7:00 pm – 10:00 pm  Kids & Teens Banquet (Ages 3-18)  
*Casco Bay*

7:00 pm – 11:00 pm  President’s Reception & Banquet  
*Black Tie Optional*  
Reception:  *Mish-A-Nock*  
*(docked, Boardwalk Marina, east side)*  
Banquet:  *Bays 1-3*
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 sponsorship of the American Association for Thoracic Surgery (AATS) and the Western Thoracic Surgical Association (WTSA). The AATS 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 **13.50 AMA PRA Category 1 Credits™**. Physicians should only claim 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 John C. Chen, and concludes with the highly successful C. Walton Lillehei Point/Counter-Point Session. The debate this year is entitled, “Time Out: Lists and Protocols Are the Best Method to Mitigate Human Error in the Hospital and Operating Room”.

WESTERN THORACIC SURGICAL ASSOCIATION
Friday morning begins with an optional breakfast session, featuring recognized leader Joshua R. Sonnett discussing “CT Screening”. The scientific program continues with two Postgraduate Courses, sponsored by an educational grant from the White Memorial Medical Center and Foundation Lyman A. Brewer, III, Fund, and a scientific plenary session of original papers.

The Saturday scientific program begins with concurrent moderated forums of shorter-form oral presentations addressing a far ranging field of topics in each of the three subspecialties. The plenary science continues with additional original papers and concludes with “Controversies in Thoracic Surgery” Session, which will address whether “Studies Drawn from Large Administrative Are Not Clinically Relevant”.

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 Courses, the Concurrent Forums on Adult Cardiac, General Thoracic and Congenital Heart Disease, and the Controversies in Thoracic Surgery session, participants will have the opportunity to hear the pros and cons of each paper and/or debate presented to gain an overall perspective of their current practices and utilize results presented to select appropriate surgical procedures and interventions for their own patients and integrate state-of-the-art knowledge into their current practice and/or research.

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;

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

- Analyze 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, as the accredited provide of this live activity, that any individual who is involved in planning, presenting, or is an author on a program designated for *AMA Physician’s Recognition Award Category 1 Credit™* must disclose any financial interest or other relationship (grant, research support, consultant, etc.) that individual has with any manufacturer(s) of any commercial product(s) that may be discussed in the individual’s presentation. This information is disclosed to the audience prior to an activity. The AATS has procedures in place if a conflict of interest should arise. In addition, faculty members are asked to disclose when any discussion of unapproved use of pharmaceutical or medical device occurs. Disclosures listed on pages 250–253 have been managed to the Association’s satisfaction.

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 Conference Center Registration during the following hours:

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday, June 26</td>
<td>1:00 pm – 6:00 pm</td>
</tr>
<tr>
<td>Thursday, June 27</td>
<td>7:00 am – 1:30 pm</td>
</tr>
<tr>
<td>Friday, June 28</td>
<td>6:00 am – 12:00 pm</td>
</tr>
<tr>
<td>Saturday, June 29</td>
<td>6:00 am – 12:00 pm</td>
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</tbody>
</table>

SPEAKER READY ROOM
The Speaker Ready Room will be located in Beauty Bay, at the end of the Conference Center Lobby Area, across from the Conference Center Bays. 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 26th). All presentations must be submitted in PowerPoint format only.

BREAKFAST SESSION
The breakfast session is scheduled for Friday morning, from 6:30 am – 7:50 am. *There is a separate registration fee of $60 per person:*

- Friday, June 28
  - CT Screening
    - Joshua R. Sonnett
    - Casco Bay & Kidd Island Bay

EXHIBITS
Commercial Exhibits are located in Bays 4-6 and open during the following hours:

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, June 27</td>
<td>7:00 am – 12:00 pm</td>
</tr>
<tr>
<td>Friday, June 28</td>
<td>7:30 am – 12:00 pm</td>
</tr>
<tr>
<td>Saturday, June 29</td>
<td>6:30 am – 10:30 am</td>
</tr>
</tbody>
</table>
Breakfast is available for all registered physicians in the Exhibit Hall during the following hours:

- Thursday, June 27: 7:00 am – 8:00 am
- Friday, June 28: 7:30 am – 8:00 am
- Saturday, June 29: 6:30 am – 7:30 am

Coffee and other beverages will be available during scheduled breaks.

**HOSPITALITY SUITE**
A hospitality suite is available in **Boardroom 5ABC** for all registered spouses, guests, and family members during the following hours:

- Thursday, June 27: 7:00 am – 11:00 am
- Friday, June 28: 7:00 am – 11:00 am
- Saturday, June 29: 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 – 10:00 am: 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 *Lewis & Clark* 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 meeting attendees and in the Hospitality Suite, located in Boardroom 5ABC, for family members). Supervised Kids & Teens Receptions, for ages 3–18, 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 26

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

Children ages 3–18 are invited to their own Kids & Teens Welcome Reception, to be held concurrently on the Front Plaza. 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 27

The morning 5K Fun Run will begin at the Front Plaza. All participants will receive an official Samson Fun Run T-shirt at the finish line. Prizes will be presented at the Saturday Luncheon.

LEWIS & CLARK THEME DINNER

Thursday, June 27

The Thursday night Theme Dinner will be held at the stunning Hagadone Event Center, with its panoramic views of Lake Coeur d’Alene, indoor/outdoor fireplaces, and celebration garden with infinity reflecting pool. Explore your sense of adventure, when, at 6:00 pm, a cruise boat will transport you from the Boardwalk Marina, east side, across the lake for a Lewis & Clark experience. (Land shuttle service will be provided for latecomers who literally miss the boat.) Interact with coyotes, meet traditional artisans, feast on an Old West Native American Summer BBQ, dance country western style, roll cigars, shoot whiskey, make campfire s’mores, and more! *All meeting registrants are welcome to attend; individual tickets are not offered.*

SATURDAY LUNCHEON

Saturday, June 29

Join registered physicians, spouses, guests, and family members for this outdoor luncheon on the Lakeview Terrace 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 29 8:00 pm – 11:00 pm

The 39th Annual Meeting will conclude with the Presidential Reception aboard the Mish-A-Nock—docked on the east side of the Boardwalk Marina—and Banquet in Bays 1-3. You won’t want to miss The Rhythm Dawgs, a local Coeur d’Alene group that will keep the room dancing for hours! Attire is Black Tie Optional.

Family members aged 3–18 will be in for their own fun evening during the concurrent Kids & Teens Banquet located in Casco Bay. Please note that all children must be registered for the meeting to attend this function.
GOLF/TENNIS TOURNAMENTS

(Separate Subscription Required)

GOLF TOURNAMENT
Coeur d’Alene Golf Course, The Coeur d’Alene

Friday, June 28  2:00 pm

This year’s golf tournament will take place on the Coeur d’Alene Golf Course, one of the most notable golf courses in America. Home of the Famous Floating Green on the 14th hole, the Coeur d’Alene Golf Course has been featured in Golf Digest, Golf Magazine, and Conde Nast Traveler as one of the world’s best golf experiences.

Designed by Scott Miller, the course offers a rousing round of golf while surrounding its players in beautiful landscapes. With views of Lake Coeur d’Alene from every hole and acres of Junipers being accentuated by beds of beautiful flowers, it is one of the most pristine courses in the United States.

The true highlight of the course is the Floating Green. One of the best-known challenges in golf is a man-made island that changes location. Land on the island and you’re a hero or join the thousands of golf balls fished out of the lake each year. If you make your shot to the green, a “putter” boat will transfer you to and from the island green. As you return from the island, the boat captain leaves you with a personalized Certificate of Achievement to commemorate completion.

Pre-registration is required with indication of handicap.

$250 per person includes transportation to/from the course, 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.]

Transportation via wooden boats begins departing from the Eagle Shuttle Marina, west end, at 12:45 pm.
TENNIS TOURNAMENT
Coeur d’Alene Tennis Courts, The Coeur d’Alene

Friday, June 28 2:00 pm

Delight in the four court complex of The Coeur d’Alene. Located adjacent to the Golf Course Pro Shop, the facility features Plexipaved Courts. Enjoy spectacular lake views while participating in the tournament.

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

$50 per person includes transportation to/from the courts, court fees, tennis balls, sports snacks and beverages, and prizes. [Racquet (rental available through pro shop—advance notification required) and shoes are not included.]

Transportation via wooden boats begins departing from the Eagle Shuttle Marina, west end, at 12:45 pm.

CHILD CARE SERVICES

The Coeur d’Alene offers a Very Important Kids (VIK) Program. This children’s camp has age-appropriate activities for children including swimming and arts and crafts in a safe environment. Visit the Coeur d’Alene website at www.cdaresort.com for details on the VIK Program. 24 hour reservations are required and can be made by calling 800-688-5253 ext. 28.

Babysitting (ages 2 +):

Private babysitting is also available in the Very Important Kids Program (VIK) from 8:00 am to 10:00 pm. Please call 800-688-5253 ext. 28 for more information.
OPTIONAL TOURS/ACTIVITIES

WHITEWATER RAFTING EXCURSION
Leaves from The Coeur d’Alene’s main entrance

Thursday, June 27 12:30 pm – 5:00 pm
Registration Required

Cost: $95.00
(must be 7 years or older; children aged 7–10 require a parental consent form)

Itinerary and Highlights:
Right in the heart of downtown Spokane flows the beautiful Spokane River. Within minutes of launching you will be floating in a forested canyon that feels miles away from civilization.

Includes: Transportation, box lunch, gear, and guide.

Skill Level: This trip is suitable for most people. However, participants should be in reasonable shape as everyone does paddle, and must be 7 years or older; children aged 7–10 require a parental consent form.

HISTORICAL TOUR OF COEUR D’ALENE
Leaves from The Coeur d’Alene’s main entrance

Thursday, June 27 1:30 pm – 4:30 pm
Registration Required

Cost: $50.00

Itinerary and Highlights:
Discover the rich history and scenic beauty of Coeur d’Alene. Start with a visit to the Museum of North Idaho, which takes you on a visual journey from Coeur d’Alene’s humble beginnings as the home of Fort Sherman, to its fast rise in the lumber industry, to the very beautiful and unique destination it is today. The museum is home to the area’s most incredible and extensive photographic archive that depicts the history of Fort Sherman and the Coeur d’Alene Lake. Next you will witness the area’s early homes and landmarks, including Fort Sherman chapel built in 1880. This tour is a fascinating cross-section of vintage buildings, churches, and Victorian homes.

Includes: Guide, museum admittance

Does Not Include: Lunch

Skill Level: This is a walking tour, so be sure to wear comfortable shoes!
ACKNOWLEDGMENTS
The Western Thoracic Surgical Association wishes to thank the following companies and organizations for their educational and marketing support of the 39th Annual Meeting:

**EDUCATIONAL GRANTS (Confirmed through May 31, 2013)**

Medtronic, Inc., for their support as a Silver Level Sponsor

St. Jude Medical for their support of the Lillehei Point/Counterpoint

White Memorial Medical Center and Foundation, Lyman A. Brewer, III, Fund for their support of Postgraduate Course I

Medtronic, Inc., for their support of the Donald B. Doty Education Award

**MARKETING SUPPORT (Confirmed through May 31, 2013)**

Cormatrix Cardiovascular, Inc.

Ethicon

MAQUET Medical Systems, USA

**EXHIBIT SUPPORT (Confirmed through May 31, 2013)**

Acute Innovations

AtriCure, Inc.

Baxter Healthcare

Biomet Microfixation

Cormatrix Cardiovascular, Inc.

CryoLife, Inc.

Davol, Inc.

DePuy Synthes CMF

Edwards Lifesciences

Elsevier Inc.

Estech

Ethicon

Genesee BioMedical, Inc.

HeartWare, Inc

KLS Martin, LP

LifeNet Health

MAQUET Medical Systems, USA

Medafor Inc.

Medtronic, Inc.

On-X Life Technologies, Inc

Pioneer Surgical Technology

rEVO Biologics

Scanlan International, Inc.

Sorin Group

St. Jude Medical

Super Dimension, Inc.

SynCardia Systems, Inc.

Terumo Cardiovascular Systems

Thoratec Corporation

Vitalcor, Inc.

Vitalitec International Inc

Wexler Surgical, Inc.
GUIDELINES FOR SPEAKERS AND DISCUSSANTS

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

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

2. Speakers are requested to present their PowerPoint Presentations in the Speaker Ready Room located in Beauty Bay, at the end of the Conference Lobby Area, across from the Conference Center Bays, 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 26th. 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 26, 2013

1:00 pm – 6:00 pm  REGISTRATION, Conference Center Registration

1:00 pm – 6:00 pm  SPEAKER READY ROOM, Beauty Bay

7:00 pm – 9:00 pm  NEW MEMBERS/WELCOME RECEPTION, Lakeview Terrace

7:00 pm – 9:00 pm  KIDS & TEENS RECEPTION, Front Plaza

THURSDAY, JUNE 27, 2013

6:00 am  SAMSON FUN RUN, Front Plaza

7:00 am – 8:00 am  BREAKFAST, Bays 4-6

7:00 am – 11:00 am  FAMILY HOSPITALITY, Boardroom 5ABC
  7:00 am – 10:00 am  Breakfast Served
  10:00 am – 11:00 am  Snacks & Beverages Served

7:00 am – 12:00 pm  EXHIBITS, Bays 4-6

7:00 am – 12:30 pm  SPEAKER READY ROOM, Beauty Bay

7:00 am – 1:30 pm  REGISTRATION, Conference Center Registration
8:00 am – 9:00 am  **SCIENTIFIC SESSION I**

*Bays 1-3*  
(*10 minutes presentation, 10 minutes discussion)*

**Moderators:** John C. Chen  
Robert C. Robbins

1. **Total Arch Replacement Using Moderate Hypothermic Circulatory Arrest and Selective Antegrade Cerebral Perfusion: Is Deep Hypothermia Essential?**  
Bradley G. Leshnower, Patrick D. Kilgo, **Edward P. Chen**  
Emory University, Atlanta, GA  
*DISCUSSANT: RICHARD C. RICHTER*

2. **Reconstruction of Right Ventricle Outflow Tract in Neonates and Infants Using Valved Cryopreserved Femoral Vein Homograft**  
**Ofer Schiller¹, Pranava Sinha¹, David Zurakowski², Richard A. Jonas¹**  
¹Children’s National Medical Center, Washington, DC;  
²Harvard Medical School, Boston, MA  
*DISCUSSANT: BRIAN L. REEMTSEN*  

*+ Samson Resident Prize Essay*


¹Stanford University, Stanford, CA; ²University of Washington Medical Center, Seattle, WA; ³David Geffen School of Medicine at UCLA, Los Angeles, CA; ⁴Duke University School of Medicine, Durham, NC; ⁵Oregon Health & Science University, Portland, OR; ⁶University of Chicago, Chicago, IL

DISCUSSANT: DOUGLAS E. WOOD

9:00 am – 9:10 am NEW MEMBER & SAMSON PRIZE FINALIST INTRODUCTIONS, Bays 1-3

9:10 am – 9:55 am PRESIDENTIAL ADDRESS

Bays 1-3

Introduced By: Thomas A. Burdon

Winning the HITECH Challenge
John C. Chen

9:55 am – 10:20 am COFFEE BREAK, VISIT EXHIBITS & POSTERS, Bays 4-6

* WTSA Member
10:00 am – 11:00 am  **SPOUSE FORUM SESSION**

**Casco Bay**

*Would You Encourage Your Children or Grandchildren to Go into Medicine?*

Francis J. Crosson

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

**Bays 1-3**

*(10 minutes presentation, 10 minutes discussion)*

Moderators: John J. Lamberti  
Paul H. Schipper

4. **Early Clinical and Angiographic Outcomes After Robotic-Assisted Coronary Artery Bypass Surgery**

*Michael E. Halkos*, Henry A. Liberman, Chandan Devireddy, Aloe V. Finn, Wissam Jaber, Robert A. Guyton, John D. Puskas

*Emory University, Atlanta, GA*

*DISCUSSANT: RICHARD SHEMIN*

5. **Should We Perform Elective Surgical Biopsies for Tumor Molecular Profiling in Patients with Metastatic Non-Small Cell Lung Cancer? The Expanding Role of the Thoracic Surgeon for the Treatment of Advanced Lung Cancer in the Era of Personalized Medicine**


*Section of General Thoracic Surgery, University of California, Davis Medical Center, Sacramento, CA; University of California, Davis Comprehensive Cancer Center, Sacramento, CA; Division of Pulmonary Medicine, University of California, Davis Medical Center, Sacramento, CA; Department of Radiology, University of California, Davis Medical Center, Sacramento, CA*

*DISCUSSANT: PATRICIA A. THISTLETHWAITE*

* WTSA Member
6. A Propensity-Matched Analysis of Two Different Strategies In High Risk Patients with Aortic Valve Stenosis: Sutureless Replacement Versus Transcatheter Implantation

Steffen Pfeiffer¹, Giuseppe Santarpino¹, Jürgen Jessl², Angelo Dell’Aquila³, Irena Grossmann¹, Giovanni Conciestré¹, Matthias Pauschinger², Theodor Fischlein¹

¹Klinikum Nürnberg – Department of Cardiac Surgery, Nuremberg, Germany; ²Klinikum Nürnberg – Department of Cardiology, Nuremberg, Germany; ³Universitätsklinikum Münster – Department of Cardiac Surgery, Münster, Germany

DISCUSSANT: MICHAEL P. FISCHBEIN

7. Assessing Surgical Risk for Adults with Congenital Heart Disease: Are Pediatric Scoring Systems Appropriate?

Brian E. Kogon¹, Matthew Oster²

¹Emory University, Atlanta, GA; ²Sibley Cardiology, Atlanta, GA

DISCUSSANT: PHILLIP T. BURCH

11:40 am – 12:30 pm C. WALTON LILLEHEI POINT/COUNTERPOINT SESSION

Bays 1-3

Time Out: Lists and Protocols Are the Best Method to Mitigate Human Error in the Hospital and Operating Room

Moderator: Lawrence H. Cohn
Pro: Matthew S. Slater
Con: Thoralf M. Sundt
12:30 pm  **ADJOURN**

12:30 pm – 5:00 pm  **WHITEWATER RAFTING EXCURSION**, Depart from Hotel Entrance

1:30 pm – 4:30 pm  **HISTORICAL TOUR OF COEUR D’ALENE**, Depart from Hotel Entrance

6:00 pm – 10:00 pm  **LEWIS AND CLARK THEME DINNER**, Hagadone Event Center
(transportation departs from Boardwalk Marina, east side)

** Separate Subscription Required
FRIDAY, JUNE 28, 2013

6:00 am – 12:00 pm  REGISTRATION, Conference Center Registration

6:00 am – 12:00 pm  SPEAKER READY ROOM, Beauty Bay

6:30 am – 7:50 am  BREAKFAST SESSION**

Casco Bay & Kidd Island Bay

CT Screening
Joshua R. Sonett

7:30 am – 8:00 am  BREAKFAST, Bays 4-6

7:00 am – 11:00 am  FAMILY HOSPITALITY, Boardroom 5ABC

7:00 am – 10:00 am  Breakfast Served
10:00 am – 11:00 am  Snacks & Beverages Served

7:30 am – 12:00 pm  EXHIBITS, Bays 4-6

8:00 am – 8:40 am  POSTGRADUATE COURSE I

Bays 1-3
Sponsored by: White Memorial Medical Center and Foundation—Lyman A. Brewer, III, Fund

Medical Miracles Cost Money
Geoffrey Sewell
Hawaii Permanente Medical Group

8:40 am – 9:20 am  POSTGRADUATE COURSE II

Bays 1-3

How to Be Successful in the Accountable Care Organization (ACO) Movement
Francis J. Crosson
J. Scott Millikan
Dominic J. Tedesco

** Separate Subscription Required
9:20 am – 11:00 am  **SCIENTIFIC SESSION III**

**Bays 1-3**

(10 minutes presentation, 9 minutes discussion)

*Includes David J. Dugan Distinguished Service Award Presentation at 10:00 am*

**Moderators:** Brian L. Reemtsen  
Patricia A. Thistlethwaite

**8. Quantification of Emphysema with Preoperative Computed Tomography Predict Pulmonary Complication More Accurately Than Pulmonary Function Test After Lung Resection Surgery**  
Kwon Joong Na, Chang Hyun Kang, Hey-Seon Kim, Jae-Hyun Jeon, Yong Won Seong, In Kyu Park, Jin Mo Goo, Young Tae Kim  
*Seoul National University Hospital, Seoul, Korea, Republic of*

**DISCUSSANT: JESS D. SCHWARTZ**

**9. Single Center Experience with the Frozen Elephant Trunk Technique in Complex Aortic Pathologies**  
Ferdinand R. Waldenberger¹, Gabriel Weiss¹, Sandra Folkmann¹, Michael Gorlitzer¹, Reinhard Moidl¹, Gerard Mertikian², Martin Grabenwoeger¹  
¹Cardio-Vascular Surgical Center, General Hospital Vienna-Hietzing, Vienna, Austria; ²Radiology Department, General Hospital Vienna-Hietzing, Vienna, Austria

**DISCUSSANT: R. SCOTT MITCHELL**
10:00 am

DAVID J. DUGAN DISTINGUISHED SERVICE AWARD PRESENTATION
Conferred to Edward D. Verrier, Seattle, Washington, by Douglas E. Wood

10. Outcomes in Lung Transplantation Following Prior Lung Volume Reduction Surgery in a Contemporary Cohort
University of Washington, Seattle, WA
DISCUSSANT: MICHAEL WEYANT

11. Competence Versus Mastery: The Time Course for Developing Expertise in VATS Lobectomy
Mark K. Ferguson², Xiao Li¹, Jun Wang¹
¹Peking University People’s Hospital, Beijing, China;
²The University of Chicago, Chicago, IL
DISCUSSANT: DAVID T. COOKE

12. Transposition of Great Arteries and Intact Ventricular Septum—Outcomes and Time Interval of Early Neonatal Repair
*Michael T. Cain², Ronald K. Woods¹,Katie Trapp³, Pippa M. Simpson¹, Yumei Cao¹, Nancy S. Ghanayem¹, James S. Tweddell¹
¹Children’s Hospital Wisconsin, Medical College of Wisconsin, Milwaukee, WI; ²Medical College of Wisconsin, Milwaukee, WI; ³Children’s Hospital Wisconsin, Milwaukee, WI
DISCUSSANT: JOHN J. LAMBERTI

11:00 am – 11:30 am
COFFEE BREAK, VISIT EXHIBITS & POSTERS, Bays 4-6

* WTSA Member
11:30 am – 12:30 pm  **SCIENTIFIC SESSION IV**

Bays 1-3

(10 minutes presentation, 10 minutes discussion)

Moderators: Michael P. Fischbein  
Wen Cheng

13. **Evolution of a Ventricular Assist Device Program in a Large Children’s Hospital**

Charles D. Fraser, Jr., Muhammad S. Khan,  
Charles D. Fraser, III, Iki Adachi, **Jeffrey S. Heinle**,  
Carlos M. Mery, Jack F. Price, Emmett D. McKenzie  
Texas Children’s Hospital, Baylor College of Medicine,  
Houston, TX

**DISCUSSANT: DAVID M. McMULLAN**

+14. **An Individual’s Frame of Reference Influences Ability to Determine Accurate Needle Angles**

Ahmad Y. Sheikh¹, Madeleine Kehner²,  
Audrey Walker³, Paul A. Chang¹, *Thomas A. Burdon¹,  
*James I. Fann¹  
¹Stanford University, Stanford, CA; ²ETS, Princeton, NJ; ³University of Dundee, Dundee, United Kingdom

**DISCUSSANT: CRAIG J. BAKER**

15. **Should Surgical Ablation for Atrial Fibrillation Be Performed in Patients with Significantly Enlarged Left Atrium?**

Niv Ad, Linda Henry, Sharon Hunt, Sari D. Holmes  
Inova Heart and Vascular Institute, Falls Church, VA

**DISCUSSANT: SURINDRA N. MITRUKA**

+ Samson Resident Prize Essay  
* WTSA Member
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<tr>
<td>12:30 pm</td>
<td><strong>ADJOURN</strong></td>
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<td>2:00 pm</td>
<td><strong>GOLF TOURNAMENT</strong>, Coeur d’Alene Golf Course</td>
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<tr>
<td>2:00 pm</td>
<td><strong>TENNIS TOURNAMENT</strong>, Coeur d’Alene Tennis Courts</td>
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Transportation for both the Golf and Tennis Tournaments begins departing from the Eagle Shuttle Marina, west end, at 12:45 pm.

**EVENING — FREE**

** Separate Subscription Required
SATURDAY, JUNE 29, 2013

6:00 am – 11:30 am  SPEAKER READY ROOM, Beauty Bay

6:00 am – 12:00 pm  REGISTRATION, Conference Center Registration

6:30 am – 7:30 am  BREAKFAST, Bays 4-6

6:30 am – 10:30 pm  EXHIBITS, Bays 4-6

7:00 am – 8:15 am  CONCURRENT FORUMS

(5 minutes presentation, 3 minutes discussion)

ADULT CARDIAC

Bays 1-3

Moderators: David A. Fullerton
Craig H. Selzman

CF1. Modeling Frailty and Risk in Proximal Aortic Surgery
Asvin M. Ganapathi, Brian R. Englum,
Jennifer M. Hanna, Matthew A. Schechter,
Anthony W. Castleberry, *Walter G. Wolfe,
Lynne M. Koweek, Jeffrey G. Gaca, G. Chad Hughes
Duke University Medical Center, Durham, NC

CF2. Greater Flow Eccentricity and Wall Shear Stress
After Valve-Sparing Aortic Root Replacement in
Patients with Sievers’ Type 1/L-R Compared to
Sievers’ 0/LAT Type Bicuspid Aortic Valves
Elizabeth H. Stephens, Thomas A. Hope,
Fabian A. Kari, John-Peder E. Kvitting,
Robert J. Herfkens, *D. Craig Miller
Stanford, Stanford, CA

* WTSA Member
CF3. Utility of the Penn Classification In Predicting Outcomes of Surgery for Acute Type A Aortic Dissection
Naoyuki Kimura, Satoshi Itoh, Hideki Morita, Koichi Adachi, Koichi Yuri, Harunobu Matsumoto, Atsushi Yamaguchi, Hideo Adachi
Jichi Medical University, Saitama Medical Center, Saitama, Japan

CF4. Pulmonary Endarterectomy: What Constitutes Adequate Surgical Training?
University of California San Diego, San Diego, CA

CF5. Mechanical Versus Bioprosthetic Mitral Valve Replacement Under Age of 65
Tsuyoshi Kaneko, Fadi Rassam, Quratulain Javed, Siobhan Mcgurk, Prem Shekar, Gregory Couper, Sary Aranki, *Lawrence Cohn
Brigham and Women’s Hospital, Boston, MA

CF6. Repair of Retrograde Ascending Dissection After Descending Stent Grafting
Jahanzaib Idrees, Amr Arafat, Lars Svensson, Eric E. Roselli
Cleveland Clinic, Cleveland, OH

* WTSA Member
CF7. Impact of Severe Left Ventricular Dysfunction on Hospital Outcome After Tavi or Surgical Aortic Valve Replacement: Results from a Propensity-Matched Population of the Italian Observant Multicenter Study
Francesco Onorati1, Paola D’Errigo2, Claudio Grossi3, Marco Barbanti4, Marco Ranucci5, Remo Daniel Covello6, Stefano Rosato2, Alice Maraschini2, Gennaro Santoro7, Corrado Tamburino4, Fulvia Seccareccia2, Francesco Santini8, Lorenzo Menicanti9
1Division of Cardiac Surgery University of Verona Medical School, Verona, Italy; 2National Institute of Health, Rome, Italy; 3Department Cardiac Surgery Santa Croce E. Carle Hospital, Cuneo, Italy; 4Division of Cardiology Ferrarotto Hospital University of Catania, Catania, Italy; 5Department of Cardiothoracic and Vascular Anesthesia-ICU and Department of Cardiac Surgery – IRCCS Policlinico San Donato, Milan, Italy; 6Department of Anesthesia & Intensive Care, San Raffaele Hospital, Milan, Italy; 7Division of Cardiology, Careggi Hospital, Florence, Italy; 8Division of Cardiac Surgery University of Genova, Genova, Italy; 9Division of Cardiac Surgery IRCCS Policlinico San Donato, San Donato Milanese, Milan, Italy

CF8. Fate of the Distal Aorta Following 1-Stage Repair of Chronic Thoracic Aortic Dissection
Nicholas T. Kouchoukos1, Alexander Kulik2, Catherine F. Castner1
1Missouri Baptist Medical Center, St. Louis, MO; 2Lynn Heart and Vascular Institute, Boca Raton Regional Hospital, Boca Raton, FL
CF9. **Robotic Lobectomy Versus VATS Lobectomy for NSCLC—Better or the Same?**
*Benjamin E. Lee*, Elaine Kletsman, Robert J. Korst
*The Valley Hospital, Ridgewood, NJ*

CF10. **Differential Prognostic Significance of Extralobar and Intralobar Nodal Metastases in Patients with Surgically Resected Stage II Non-Small Cell Lung Cancer**
*John C. Haney*, Jennifer M. Hanna, Mark F. Berry, Matthew G. Hartwig, David H. Harpole, Thomas A. D’Amico, Betty C. Tong, Mark W. Onaitis
*Duke University Medical Center, Durham, NC*

CF11. **The Role of Epidermal Growth Factor Receptor Tyrosine Kinase Inhibitor In Recurrent Pulmonary Adenocarcinoma After Curative Surgical Resection**
*Jae Hyun Jeon*, Chang Hyun Kang, Young Tae Kim, In Kyu Park, Hye-seon Kim
*Seoul National University Hospital, Seoul, Korea, Republic of*

CF12. **Hyperbaric Oxygen Therapy for the Treatment of Anastomotic Complications Following Tracheal Resection and Reconstruction**
*Cameron T. Stock, Jr.*, Natalie Gukasyan, Ashok Muniappan, Cameron D. Wright, Douglas J. Mathisen
*Massachusetts General Hospital, Boston, MA*

CF13. **Twelve-Year Follow-Up After VATS Sympathotomy for Hyperhidrosis**
*Ayesha S. Bryant*, *Robert J. Cerfolio*
*University of Alabama at Birmingham, Birmingham, AL*

* WTSA Member
CF14. Alimentary Function and Quality of Life 10 or More Years After Esophagectomy with Gastric Pull-Up
Keck School of Medicine of the University of Southern California, Los Angeles, CA

CF15. Central Tumor Location for Clinical Stage I Non-Small Cell Lung Cancer (NSCLC): An Underappreciated Negative Prognostic Feature
David D. Odell1, Matthew J. Schuchert1, Kristen N. McCormick1, Joseph J. Wizorek1, David O. Wilson2, Jill M. Siegfried3, James D. Luketich1, Rodney J. Landreneau1
1Department of Cardiothoracic Surgery; University of Pittsburgh Medical Center, Pittsburgh, PA; 2Department of Medicine; Division of Pulmonary Medicine; University of Pittsburgh Medical Center, Pittsburgh, PA; 3Pharmacology and Chemical Biology; University of Pittsburgh Medical Center, Pittsburgh, PA

CF16. Methicillin-Resistant Staphylococcus Aureus Colonization and Empyema—Does It Matter?
Jennifer L. Dixon, Harry T. Papaconstantinou, Daniel Jupiter, Philip A. Rascoe, Scott I. Reznik
Scott and White Memorial Hospital, Temple, TX

* WTSA Member
CONGENITAL HEART DISEASE

Kidd Island

Moderators: Gordon A. Cohen
Winfield J. Wells

CF17. The Long-Term Outcome of Right Ventricle to Pulmonary Artery Conduit for Biventricular Repair: Single Center Experience
Takeshi Shinkawa, Carl Chipman, Michiaki Imamura
Arkansas Children’s Hospital, Little Rock, AR

CF18. The Utility of Cross Sectional Imaging in the Management of the Neonatal Hypoplastic Aortic Arch
Rabin Gerrah, Rachel E. Sunstrom, Rich D. Reed, Stephen M. Langley
Oregon Health and Science University, Portland, OR

CF19. Defining the Best Practice Patterns for the Neonatal BT Shunt Procedure
Giv Heidari Bateni¹, Sayna Norouzi¹, Matthew Hall², Pirooz Eghtesady¹
¹Washington University School of Medicine, St. Louis, MO; ²Child Health Corporation of America, Shawnee Mission, KS

CF20. Contemporary Outcomes with Surgical Management of Heterotaxy Syndrome associated with Pulmonary Atresia or Pulmonary Stenosis
UT Southwestern Medical Center at Dallas, Dallas, TX
CF21. Outcomes of Tricuspid Valve Repair in Children with Hypoplastic Left Heart Syndrome: Is the Presence of Tricuspid Valve Regurgitation a Risk Factor for Survival?  
*Mark Ruzmetov*, Dale M. Geiss, *Randall S. Fortuna  
Children’s Hospital of Illinois, Peoria, IL

CF22. Outcomes of Systemic to Pulmonary Artery Shunts in Patients Less Than 3 Kg—Analysis of Shunt Type and Size  
*Ronald K. Woods¹*, John Myers², Yumei Cao³, Pippa Simpson³, Nancy S. Ghanayem⁴, James S. Tweddell⁴  
¹Children’s Hospital Wisconsin; Medical College of Wisconsin, Milwaukee, WI; ²Medical College of Wisconsin, Milwaukee, WI; ³Children’s Hospital Wisconsin, Medical College of Wisconsin, Milwaukee, WI; ⁴Children’s Hospital Wisconsin; Medical College of Wisconsin, Milwaukee, WI

CF23. Mid-Term Outcome of Hybrid versus Norwood Approach to HLHS: Contemporary Series from a Single Center  
*Alexander Brescia*, Saadeh Jureidini, Saar Danon, Andrew Fiore, Charles Huddleston  
Saint Louis University School of Medicine, St. Louis, MO

CF24. Bilateral Branch Pulmonary Arterial Banding Has Long-Term Negative Consequences For Pulmonary Arterial Growth  
*Ryan Robert Davies*, Wolfgang A. Radtke, Dore Klenk, Christian Pizarro  
Nemours/A.I. duPont Hospital for Children, Wilmington, DE

7:00 am – 11:00 am  FAMILY HOSPITALITY, Boardroom 5ABC  
7:00 am – 10:00 am  Breakfast Served  
10:00 am – 11:00 am  Snacks & Beverages Served

*WTSA Member*
8:30 am – 9:50 am  **SCIENTIFIC SESSION V**

**Bays 1-3**

*(10 minutes presentation, 10 minutes discussion)*

Moderators: Ross M. Bremner  
Thomas A. Burdon

16. **Safety and Efficacy of Prothrombin Complex Concentrates for the Treatment of Coagulopathy Following Cardiac Surgery**

*Howard K. Song*, *Frederick A. Tibayan, Ed A. Kahl, Valerie A. Sera, *Matthew S. Slater,  
Thomas G. Deloughery, Mick M. Scanlan  
Oregon Health and Science University, Portland, OR

**DISCUSSANT: DANIEL L. SERNA**

17. **Combined Heart-Kidney Transplant Improves Post-Transplant Survival Compared to Isolated Heart Transplant in Recipients with Reduced Glomerular Filtration Rate: Analysis of 593 Combined Heart-Kidney Transplants from the United Network Organ Sharing Database**

Tara Karamlou¹, Jill Gelow², *Karl F. Welke³,  
*Matthew S. Slater², *Frederick Tibayan²,  
James M. Mudd², *Michael McMullan³,  
*Gordon A. Cohen¹, *Howard K. Song²  
¹University of California, San Francisco, San Francisco, CA; ²Oregon Health and Science University, Portland, OR; ³Seattle Children’s Hospital, Seattle, WA

**DISCUSSANT: ABBAS ARDEHALI**

* WTSA Member
18. Effect of Mechanical Assistance of the Systemic Single Ventricle in Single Ventricle Circulation with Cavopulmonary Connection
Pranava Sinha¹, Nina Deutsch¹, Kanishka Ratnayaka¹, Robert Lederman², Mustafa Kurkuoglu¹, Murfad Peer¹, Dingchao He¹, Mark Nuszkowski¹, Erin Montague¹, Gerald Mikesell¹, Nobuyuki Ishibashi¹, David Zurakowski³, Richard Jonas¹
¹Children’s National Medical Center, Washington, DC; ²National Institutes of Health, Bethesda, MD; ³Boston Children’s Hospital, Boston, MA
DISCUSSANT: WEN CHENG

+19. Reoperative Aortic Valve Replacement in the Octogenarians—Minimally Invasive Technique in the Era of Transcatheter Valve Replacement
Tsuyoshi Kaneko, Fadi Rassam, Igor Gosev, Dan Loberman, Arul Furtado, Siobhan McGurk, Gregory Couper, *Lawrence Cohn
Brigham and Women’s Hospital, Boston, MA
DISCUSSANT: THOMAS A. MOLLOY

9:50 am – 10:10 am COFFE BREAK, VISIT EXHIBITS & POSTERS, Bays 4-6

10:10 am – 11:10 am SCIENTIFIC SESSION VI

Bays 1-3
(10 minutes presentation, 10 minutes discussion)
Moderators: Joseph C. Cleveland, Daniel L. Serna

+20. Surgical Care Improvement Project (SCIP) Measure for Postoperative Glucose Control Should Not Be Used As a Proxy of Quality Following Cardiac Surgery
Damien J. LaPar, James M. Isbell, Gorav Ailawadi, Irving L. Kron
University of Virginia, Charlottesville, VA
DISCUSSANT: BRIAN S. CAIN

+ Samson Resident Prize Essay
* WTSA Member
+21. **A Novel Approach for the Accurate Prediction of Thoracic Surgery Workforce Requirements**  
Janet Edwards¹, Indraneel Datta¹,  
John Douglas Hunt¹, Kevin John Stefan²,  
Chad G. Ball¹, Elijah Dixon¹, *Sean C. Grondin¹  
¹University of Calgary, Calgary, AB, Canada; ²HBA Specto Incorporated, Calgary, AB, Canada  
DISCUSSANT: PAUL H. SCHIPPER

+22. **Outcomes in Patients Undergoing HeartMate II Versus Heartware Left Ventricular Assist Device as a Bridge to Transplantation—A Single Center Experience**  
Anton Sabashnikov, Bartlomiej Zych,  
Prashant N. Mohite, Rachel Hards,  
Aron-Frederik Popov, Diana Garcia,  
Massimo Capoccia, André Simon  
Royal Brompton & Harefield NHS Foundation Trust, London, United Kingdom  
DISCUSSANT: JACK G. COPELAND

11:10 am – 12:00 pm **CONTROVERSIES IN THORACIC SURGERY**

Bays 1-3

**Studies Drawn from Large Administrative Databases Are Not Clinically Relevant**

Moderator: Paul H. Schipper  
They Are Not Relevant: Brian L. Reemtsen  
They Are Relevant: Karl F. Welke

* Samson Resident Prize Essay  
* WTSA Member
12:00 pm – 12:30 pm **ANNUAL BUSINESS MEETING** (Members Only), Bays 1-3

12:30 pm – 2:00 pm **FAMILY LUNCHEON**, Lakeview Terrace

7:00 pm – 10:00 pm **KIDS & TEENS BANQUET**, Casco Bay

7:00 pm – 11:00 pm **PRESIDENT’S RECEPTION AND BANQUET**

*Black Tie Optional*

Reception:  *Mish-A-Nock*  
(docked, Boardwalk Marina, east side)

Banquet:  *Bays 1-3*
## FULL SCIENTIFIC PROGRAM

### WEDNESDAY, JUNE 26, 2013

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<td><strong>BREAKFAST</strong>, Bays 4-6</td>
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<td>7:00 am – 11:00 am</td>
<td><strong>FAMILY HOSPITALITY</strong>, Boardroom 5ABC</td>
<td></td>
</tr>
<tr>
<td>7:00 am – 10:00 am</td>
<td>Breakfast Served</td>
<td></td>
</tr>
<tr>
<td>10:00 am – 11:00 am</td>
<td>Snacks &amp; Beverages Served</td>
<td></td>
</tr>
<tr>
<td>7:00 am – 12:00 pm</td>
<td><strong>EXHIBITS</strong>, Bays 4-6</td>
<td></td>
</tr>
<tr>
<td>7:00 am – 12:30 pm</td>
<td><strong>SPEAKER READY ROOM</strong>, Beauty Bay</td>
<td></td>
</tr>
<tr>
<td>7:00 am – 1:30 pm</td>
<td><strong>REGISTRATION</strong>, Conference Center Registration</td>
<td></td>
</tr>
</tbody>
</table>
1. **Total Arch Replacement Using Moderate Hypothermic Circulatory Arrest and Selective Antegrade Cerebral Perfusion: Is Deep Hypothermia Essential?**

   Bradley G. Leshnower, Patrick D. Kilgo, **Edward P. Chen**

   **Emory University, Atlanta, GA**

   **DISCUSSANT:** **RICHARD C. RICHTER**

**BACKGROUND:** Circulation management for total aortic arch replacement (TOTAL) has traditionally involved deep hypothermic circulatory arrest. Moderate hypothermia (MHCA) combined with selective antegrade cerebral perfusion (SACP) is a proven method of cerebral protection for open hemiarch reconstruction. In this study, the clinical outcomes and impact of using MHCA and SACP in the setting of TOTAL were examined.

**METHODS:** From 1/2004 to 12/2012, 733 patients underwent open arch reconstruction with MHCA and SACP via right axillary artery cannulation. Of these, 145 (20%) patients underwent TOTAL. Adjustments were made for age, renal failure, diabetes, redo and lung disease (None, Mild, Moderate, Severe) using multivariable logistic regression models and adjusted odds ratios (AOR) with 95% confidence intervals (CI). Measured outcomes included death, stroke, temporary neurologic dysfunction (TND), renal failure, and major adverse cardiac events (MACE, a composite of the outcomes). Mean follow-up was 33 months and ranged 0–95 months.

**RESULTS:** The mean age was 58.4 years for the entire cohort. Core temperature at the onset of MHCA was 25.8°C for TOTAL patients. CPB and myocardial ischemic times for TOTAL were 236 minutes and 181 minutes, respectively. Twenty-three (16%) of TOTAL patients underwent emergent repair of acute Type A dissection. Fifty-four (37%) of the TOTAL cases were re-operative and 52 (37%) were Stage I Elephant Trunk procedures. Concomitant root replacement was performed in 50 (34%) of TOTAL, including 20 David V valve-sparing procedures. The mean duration of circulatory arrest time for TOTAL was 54.6 ± 16.3 min. The operative mortality in TOTAL patients was 9.7%. The overall incidence of stroke and temporary neurologic dysfunction (TND) was 2.8% and 5.6% in the TOTAL group. Four of the TOTAL patients (2.8%) required post-op dialysis. There were no cases of postoperative
paraplegia. Incidence of MACE was 14.9%. Seven-year survival was 85.9% in TOTAL patients. Survival was significantly reduced ($p = 0.042$) following emergency repair of type A dissection (83.8%) compared to elective surgery (89.5%). In a multivariable logistic regression analysis, higher temperature during TOTAL was not found to be a significant risk factor for adverse events (Table).

<table>
<thead>
<tr>
<th>Outcome</th>
<th>AOR (95% CI)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>0.81 (0.65–1.00)</td>
<td>0.05</td>
</tr>
<tr>
<td>Stroke</td>
<td>0.90 (0.62–1.30)</td>
<td>0.57</td>
</tr>
<tr>
<td>TND</td>
<td>0.91 (0.70–1.19)</td>
<td>0.51</td>
</tr>
<tr>
<td>New Dialysis</td>
<td>0.81 (0.55–1.18)</td>
<td>0.27</td>
</tr>
<tr>
<td>MACE</td>
<td>0.87 (0.74–1.03)</td>
<td>0.10</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Total aortic arch replacement using MHCA and SACP can be accomplished with excellent early and late results. MHCA was not associated with adverse neurologic outcomes or worse operative outcome in TOTAL, despite prolonged periods of circulatory arrest. Furthermore, MHCA did not compromise visceral end-organ protection. These data suggest that MHCA and SACP represent an effective strategy for complex TOTAL. Deep hypothermic circulatory arrest is no longer essential in the circulation management for TOTAL.
+2. Reconstruction of Right Ventricle Outflow Tract in Neonates and Infants Using Valved Cryopreserved Femoral Vein Homograft

Ofer Schiller¹, Pranava Sinha¹, David Zurakowski², Richard A. Jonas¹
¹Children’s National Medical Center, Washington, DC; ²Harvard Medical School, Boston, MA

DISCUSSION: BRIAN L. REEMTSEN

BACKGROUND: Aortic or pulmonary homografts are the commonest biomaterials used for restoration of right ventricle (RV) to pulmonary artery (PA) continuity for repair of a variety of complex biventricular congenital heart defects with absent native right ventricular outflow tracts. Due to shortage of appropriate sized pulmonary and aortic homografts for neonates and infants (size range 9 to 15 mm in diameter), we switched to using a valved segments of cryopreserved femoral vein homograft (CFVH) for RV-PA reconstruction for this patient population in July of 2008. We report our intermediate term experience with the use this novel alternative for right ventricular outflow tract reconstruction.

METHODS: Neonates or infants (<1 yrs) who underwent single-stage, complete biventricular repair of complex congenital heart defects using CFVH as RV-PA conduit between July 2008 and March 2012 constituted the study population (FVH group). The historical control group included children with similar heart defects, matched by age and weight that had aortic or pulmonary homografts for RV-PA restoration (APH Group) in the past. Univariate and multivariable analyses were performed to compare demographic, peri-operative, and follow up data between the 2 groups. Follow up data was analyzed for freedom from catheter-reintervention (percutaneous catheter reintervention), reoperation (surgical conduit revision/replacement) or overall freedom from reintervention (catheter and/or surgical) using Kaplan Meier analysis and log rank test to identify intergroup differences.

RESULTS: 14 children received CFVH; and 16 children received aortic or pulmonary homograft for RV-PA restoration. There were 2 operative mortalities in the FVH group, which were unrelated to the conduit, and none in APH group. The 2 groups were comparable with regards to demographic and perioperative variables.
Univariate analysis revealed significantly lower catheter-reintervention ($P = 0.02$) and reoperation ($P = 0.03$) in FVH Group (Table 1), and a longer follow up time for APH compared to FVH Group (2437 days vs. 660 days, $P < 0.01$). After controlling for the effect of difference in follow-up duration using multivariate logistic regression, FVH group continued to show significantly higher freedom from reoperation compared to APH group ($P = 0.03$). Kaplan-Meier analysis using the log-rank test indicated similar freedom from catheter-based reintervention ($P = 0.17$), reoperation ($P = 0.94$), or any reintervention ($P = 0.37$) between the 2 groups (Figure 1).

**Table 1: Comparison of Demographic and Reintervention Data Between the FVH and the APH Groups**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Femoral Vein Homograft FVH Group (n = 14)</th>
<th>Aortic/Pulmonary Homograft APH Group (n = 16)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (M/F)</td>
<td>7/7</td>
<td>6/10</td>
<td>0.71</td>
</tr>
<tr>
<td>Age, days</td>
<td>20 (7–52)</td>
<td>11 (7–40)</td>
<td>0.50</td>
</tr>
<tr>
<td>Weight, Kg</td>
<td>3.1 (2.9–3.9)</td>
<td>3.4 (2.8–3.8)</td>
<td>0.58</td>
</tr>
<tr>
<td>Body surface area</td>
<td>0.31 (0.20–0.24)</td>
<td>0.22 (0.19–0.23)</td>
<td>0.79</td>
</tr>
<tr>
<td>Graft diameter, mm</td>
<td>10.5 (10–11)</td>
<td>10.5 (9–12)</td>
<td>0.70</td>
</tr>
<tr>
<td>Diagnosis:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–Truncus Arteriosus</td>
<td>6 (43%)</td>
<td>10 (63%)</td>
<td>NS</td>
</tr>
<tr>
<td>–Pulmonary Atresia/VSD</td>
<td>4 (29%)</td>
<td>4 (25%)</td>
<td></td>
</tr>
<tr>
<td>–d-TGA/Pulmonary stenosis</td>
<td>1 (7%)</td>
<td>1 (6%)</td>
<td></td>
</tr>
<tr>
<td>–IAA/Aortic Atresia</td>
<td>1 (7%)</td>
<td>1 (6%)</td>
<td></td>
</tr>
<tr>
<td>–DORV/Pulmonary stenosis</td>
<td>2 (14%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Follow-up, days</td>
<td>660 (278–867)</td>
<td>2437 (1527–2794)</td>
<td>&lt;0.01*</td>
</tr>
<tr>
<td>Reintervention:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>–Catheter Reintervention</td>
<td>5 (36%)</td>
<td>13 (81%)</td>
<td>0.02*</td>
</tr>
<tr>
<td>–Reoperation</td>
<td>2 (14%)</td>
<td>9 (56%)</td>
<td>0.03*</td>
</tr>
<tr>
<td>–Overall (Catheter &amp; or Surgical)</td>
<td>7 (50%)</td>
<td>13 (81%)</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Continuous data are presented as median (interquartile range) and categorical data as numbers (proportions).

DORV, Double Outlet Right Ventricle; d-TGA, d-Transposition of the Great Arteries; IAA, Interrupted Aortic Arch; VSD, Ventricular Septal Defect

* Statistically significant differences between FVH and APH groups
CONCLUSIONS: Femoral vein homografts are comparable to aortic or pulmonary homografts for right ventricular outflow tract reconstruction for neonates and infants. In the short-intermediate term, use of femoral vein homografts leads to reduced need for conduit reoperations. Ready availability of femoral vein valved homograft segments especially in the 9–15 mm size range, which is marked by severe shortage of aortic or pulmonary homografts, makes it an attractive alternative for right ventricular outflow tract reconstruction in neonates and infants.


1Stanford University, Stanford, CA; 2University of Washington Medical Center, Seattle, WA; 3David Geffen School of Medicine at UCLA, Los Angeles, CA; 4Duke University School of Medicine, Durham, NC; 5Oregon Health & Science University, Portland, OR; 6University of Chicago, Chicago, IL

DISCUSSANT: DOUGLAS E. WOOD

BACKGROUND: Radical surgery for MPM may improve survival. Although similar survival has been reported for EPP and PD, their surgical morbidity and mortality may differ significantly. Using a multi-center national thoracic surgery database, we set out to compare early surgical outcomes and influence of center volume for PD and EPP.

METHODS: From 2009 to 2011, all patients in the STS-GTSD (2,081) with a primary diagnosis of “pleural tumor, malignant (e.g., mesothelioma), 163.9” who underwent either EPP or PD were identified. Most centers reported ≤8 procedures over this time period while a distinct, smaller group of centers reported a larger number of procedures (≥15; which defined a higher volume center in this study). Pre- and postoperative variables were compared using univariate and multivariate analyses to determine the impact of procedure and center volume on operative (30-day) mortality and major postoperative complications (unexpected reoperation, bleeding requiring reoperation, ARDS, reintubation, tracheostomy, empyema, bronchopleural fistula, sepsis, pulmonary embolism, pneumonia, myocardial infarction, or ventricular arrhythmia requiring treatment).

RESULTS: 225 patients underwent either EPP (n = 95) or PD (n = 130) for MPM. Preoperative variables including medical comorbidities, pulmonary function, American Society of Anesthesiologists Risk Class, and Zubrod Score were statistically equivalent between these two groups, with two exceptions: patients in the PD cohort were slightly older (68.3 ± 9.5 vs. 63.2 ± 7.8 years, p < 0.001) and received preoperative chemotherapy less often (17.8% vs. 30.1%, p = 0.04). Mortality was

* WTSA Member
significantly greater following EPP (10.5% vs. 3.1%, p = 0.03), as were major adverse events including ARDS (8.4% vs. 0.8%, p = 0.005), reintubation (14.7% vs. 2.3%, p = 0.001), unexpected reoperation (9.5% vs. 1.5%, p = 0.01), and sepsis (4.2% vs. 0%, p = 0.03). Prolonged postoperative air leak was seen in 23.1% of PD cases. Postoperative length of stay was 10.0 ± 7.4 days for EPP and 8.1 ± 8.7 days for PD (p = 0.001). Among 48 participating centers, only 3 centers had higher volumes of PD and only 2 centers had higher volumes of EPP. Compared to higher volume centers, those with lower volumes saw no increase in mortality (3.9% vs. 0%, p = 0.58) or major morbidity (2.9% vs. 7.1%, p = 0.29) for PD, however rates of ARDS after EPP were higher in lower volume centers (0% vs. 12.5%, p = 0.05). Operative mortality was not statistically different between higher and lower volume EPP centers (6.5% vs. 12.5%, p = 0.49). In multivariate analyses EPP was independently associated with increased operative mortality (OR 4.0, 1.0–15.6, p = 0.04) and major morbidity (OR 8.1, 2.6–25.9, p < 0.001). Adjusted for procedure volume, procedure type remained a predictor of major morbidity (OR 6.3, 2.1–18.7, p < 0.001), but not of mortality (OR 3.5, 0.9–12.9, p = 0.06).

**CONCLUSIONS:** Among participants of a national general thoracic surgery database, EPP for MPM is associated with higher postoperative morbidity and mortality compared to PD in similar patients. The lower postoperative risk independent of center volume constitutes a potential advantage of PD for patients with MPM. Given the limited statistical power, these findings should be confirmed in larger studies.
9:00 am – 9:10 am  **NEW MEMBER & SAMSON PRIZE FINALIST INTRODUCTIONS, Bays 1-3**

9:10 am – 9:55 am  **PRESIDENTIAL ADDRESS**

*Bays 1-3*

Introduced By: Thomas A. Burdon

**Winning the HITECH Challenge**

John C. Chen

9:55 am – 10:20 am  **COFFEE BREAK, VISIT EXHIBITS & POSTERS, Bays 4-6**

10:00 am – 11:00 am  **SPOUSE FORUM SESSION**

*Casco Bay*

**Would You Encourage Your Children or Grandchildren to Go into Medicine?**

Francis J. Crosson

**NOTES**
4. Early Clinical and Angiographic Outcomes After Robotic-Assisted Coronary Artery Bypass Surgery
Michael E. Halkos, Henry A. Liberman, Chandan Devireddy, Alok V. Finn, Wissam Jaber, Robert A. Guyton, John D. Puskas
Emory University, Atlanta, GA
DISCUSSANT: RICHARD SHEMIN

OBJECTIVES: Robotic-assisted coronary artery bypass surgery (CABG) has emerged as an alternative to traditional CABG via sternotomy or percutaneous coronary intervention for patients with coronary artery disease. However, the safety and efficacy of this minimally-invasive procedure has not been established in large series.

METHODS: Between October 2009 and September 2012, 307 consecutive robotic-assisted CABG procedures (mean age 62.7 ± 11.6 years) were performed at a single US institution by 2 surgeons. Isolated, off-pump, left internal mammary artery (LIMA) to left anterior descending coronary artery (LAD) grafting was planned via a 3–4 cm non-rib-spreading minithoracotomy after robotic LIMA harvest and pericardiotomy in all patients. Hybrid coronary revascularization was planned in 159 (51.8%) patients. Of the 199 (64.8%) angiograms performed before discharge, 62 were performed as completion angiograms in a hybrid suite immediately after LIMA-LAD grafting.

RESULTS: The mean Society of Thoracic Surgeons Predicted Risk of Mortality for this cohort was 1.2%. Eighty-seven (28.3%) patients presented with myocardial infarction (MI) within 7 days of surgery, 106 (34.5%) had diabetes, and 153 (48.8%) underwent urgent procedures. Thirty-day mortality occurred in 4 (1.3%) patients, conversion to sternotomy in 16 (5.2%) patients, postoperative MI in 5 (1.6%) patients, and re-exploration for bleeding in 7 (2.3%) patients. There were no postoperative strokes (see table for additional clinical outcomes). For the 199 patients with follow-up angiography before discharge, the LIMA was confirmed to be patent (<50% stenosis) in 191 (96.0%) patients. Among the 8 patients with significant (>50% stenosis) defects, 4 patients had occluded grafts, 2 had LAD occlusion distal to the anastomosis, and 2 had significant lesions in the LIMA proximal to the anastomosis. Among the 62 patients with intraoperative completion angiography, 4 patients (4 of the 8 patients with significant defects) underwent surgical graft revision, 2 via minithoracotomy and 2 after conversion to sternotomy.
Clinical Outcomes

<table>
<thead>
<tr>
<th>Clinical Outcome</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postoperative Atrial Fibrillation</td>
<td>47 (15.3%)</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>6 (2.0%)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>10 (3.3%)</td>
</tr>
<tr>
<td>Number of patients receiving any blood product transfusion</td>
<td>66 (21.5%)</td>
</tr>
<tr>
<td>Superficial wound infection</td>
<td>6 (2.0%)</td>
</tr>
<tr>
<td>Mediastinitis</td>
<td>0</td>
</tr>
<tr>
<td>Extubated in operating room</td>
<td>123 (40.0%)</td>
</tr>
<tr>
<td>Median ventilation time</td>
<td>2.0 hours (range 0–193)</td>
</tr>
<tr>
<td>Median ICU length of stay</td>
<td>1.0 days (range 0–19)</td>
</tr>
<tr>
<td>Median hospital length of stay</td>
<td>4.0 days (range 2–27)</td>
</tr>
</tbody>
</table>

CONCLUSIONS: Robotic-assisted CABG is a safe and effective alternative to traditional CABG for patients with single or multivessel CAD, with comparable short-term clinical and angiographic results. Postoperative or completion angiography provides valuable feedback on graft quality and patency, even in the absence of clinical findings, and should be considered during the surgeon’s early experience with robotic-assisted CABG.
5. **Should We Perform Elective Surgical Biopsies for Tumor Molecular Profiling in Patients with Metastatic Non-Small Cell Lung Cancer? The Expanding Role of the Thoracic Surgeon for the Treatment of Advanced Lung Cancer in the Era of Personalized Medicine**

*David T. Cooke¹, David R. Gandara², Royce F. Calhoun¹, Jessica Harvey-Taylor¹, Valerie Kuderer¹, Primo N. Lara, Jr.², Tianhong Li², Philip C. Mack², Ken Y. Yoneda³, David K. Shelton⁴, Friedrich Knollmann⁴, Elizabeth A. David¹

¹Section of General Thoracic Surgery, University of California, Davis Medical Center, Sacramento, CA; ²University of California, Davis Comprehensive Cancer Center, Sacramento, CA; ³Division of Pulmonary Medicine, University of California, Davis Medical Center, Sacramento, CA; ⁴Department of Radiology, University of California, Davis Medical Center, Sacramento, CA

**DISCUSSANT: PATRICIA A. THISTLETHWAITE**

**OBJECTIVES:** Molecular tumor profiling to direct targeted personalized therapy has led to progress in treating patients with advanced NSCLC. Emerging guidelines stress the need for adequate tumor tissue acquisition at the time of diagnosis or progression of disease to determine changes in driver oncogenes. Although percutaneous and endobronchial strategies are often successful in providing adequate tumor specimen, surgical biopsy may be preferential in many cases. We reviewed our practice for determining which patients with metastatic (stage IV) NSCLC should undergo surgical biopsy for molecular testing. We also measured the feasibility and patient safety of thoracic surgical tumor biopsy and its impact on subsequent therapeutic decision making.

**METHODS:** In this single institution retrospective analysis, patients with Stage IV NSCLC undergoing elective surgical tissue biopsy for molecular analysis were evaluated from March 2011 to November 2012. Patient demographics, tumor profiling results and postoperative specific variables were measured.

**RESULTS:** Twenty-one patients with stage IV NSCLC undergoing surgical biopsy were identified. All cases were discussed at the multidisciplinary thoracic oncology conference and/or during a multidisciplinary thoracic oncology clinic. Discussions achieved consensus agreement on the likelihood of success of new or additional percutaneous or endobronchial biopsy, the appropriateness and best lesions for surgical biopsy, timing of operation in the day to best coordinate optimal tissue transport.

* WTSA Member
and the case-specific goals for molecular testing. Mean age was 56.1 years (range 36–79), 13 (61.9%) patients were female, and mean Zubrod performance status was 1.1 (range 0–3). Preoperative histologies (n, %) were: adenocarcinoma (16, 76.2%), squamous cell carcinoma (2, 9.5%), neuroendocrine (1, 4.8%), and unknown (2, 9.5%). Surgical procedures (n, %) consisted of VATS wedge biopsy (12, 57.1%), VATS pleural biopsy (3, 14.3%), mediastinoscopy (2, 9.5%), supraclavicular lymph node excisional biopsy (2, 9.5%), and rib/chest wall resection (2, 9.5%).

Review of postoperative outcomes demonstrated no deaths and five post-operative complications, consisting of two wound infections, one urinary tract infection, one hemothorax requiring same-day reoperation and one unplanned ICU admission. The median length of stay was one day (range 0–4 days) and there were no 30-day readmissions. Surgical biopsy identified potentially targetable molecular data in 14 (66.7%) patients (see Table). Equally important, absence of new or additional driver oncogenes was shown in 6 patients (28.6%). Two patients (9.5%) received new diagnoses. For one patient (4.8%) the surgical pathology was non-diagnostic. Surgical data changed the treatment strategy for 11 patients (52.4%), and eight of those patients (72.7%; 38.1% of total cohort) were enrolled into therapeutic targeted clinical trials based on surgical pathology results.

### Table

<table>
<thead>
<tr>
<th>Principle Lung Cancer Molecular Targets Identified</th>
<th>N</th>
<th>% of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGFR Sensitizing Mutations</td>
<td>8</td>
<td>38.1</td>
</tr>
<tr>
<td>EGFR Resistance Mutations</td>
<td>3</td>
<td>14.3</td>
</tr>
<tr>
<td>EML4-ALK</td>
<td>2</td>
<td>9.5</td>
</tr>
<tr>
<td>KRAS Mutations</td>
<td>1</td>
<td>4.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Secondary Lung Cancer Molecular Targets Identified</th>
<th>N</th>
<th>% of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGFR Overexpression</td>
<td>5</td>
<td>23.8</td>
</tr>
<tr>
<td>ERCC1 Low Expression</td>
<td>5</td>
<td>23.8</td>
</tr>
<tr>
<td>RRM1 Low Expression</td>
<td>2</td>
<td>9.5</td>
</tr>
<tr>
<td>C-MET Overexpression</td>
<td>3</td>
<td>14.3</td>
</tr>
</tbody>
</table>

CONCLUSIONS: These data support a role for thoracic surgical biopsy in appropriately selected patients with stage IV NSCLC, as surgical biopsy derived molecular profiling data provides information that can direct appropriate therapy and fosters enrollment into relevant clinical trials. Advanced-stage NSCLC patients should be discussed in a multidisciplinary setting to determine the need and strategy for thoracic surgical biopsy for molecular analysis.
6. A Propensity-Matched Analysis of Two Different Strategies In High Risk Patients with Aortic Valve Stenosis: Sutureless Replacement Versus Transcatheter Implantation

Steffen Pfeiffer1, Giuseppe Santarpino1, Jürgen Jessl2, Angelo Dell’Aquila3, Irena Grossmann1, Giovanni Concistré1, Matthias Pauschinger2, Theodor Fischlein1

1Klimikum Nürnberg – Department of Cardiac Surgery, Nuremberg, Germany; 2Klimikum Nürnberg – Department of Cardiology, Nuremberg, Germany; 3Universitätsklinikum Münster – Department of Cardiac Surgery, Münster, Germany

DISCUSSANT: MICHAEL P. FISCHBEIN

OBJECTIVES: Transcatheter aortic valve implantation (TAVI) has been introduced to treat high-risk surgical patients with considerable results. However, sutureless aortic valves (Sutureless) have been proposed as a therapeutic option to reduce surgical time and potentially reduce perioperative risk, especially with a mini invasive approach. They show good outcome in comparable patients. The objective of this propensity-matched study is to compare clinical and echocardiographic outcome at hospital discharge of patients undergoing TAVI versus Sutureless, in particular with regards to paravalvular leaks being a limit factor for life expectancy after the procedure.

METHODS: 2009, a TAVI-register (Edwards Sapien and Sapien XT by transfemoral and transapical approaches) and a sutureless clinical study with the Sorin Perceval S prosthesis with a minimally invasive approach were started at our Center. Until March 2012, a total of 122 patients had undergone sutureless valve implantation (79.4 ± 5.3 years old, LogEuroSCORE 11 ± 8.4). These patients were compared with 122 TAVI patients (84.6 ± 6.2 years old, LogEuroSCORE 11 ± 2.5). Based on a propensity score analysis, 2 groups with 37 matched pairs were created. Clinical and echocardiographic files were recorded.

RESULTS: Preoperative characteristics and risk scores of the 2 groups were comparable. Hospital mortality was 8.1% (3 patients) in TAVI and 0 in Sutureless (p 0.24). We faced 3 intraoperative complications with Sutureless (1 bleeding with need for conversion, 1 prosthetic explantation due to malposition, 1 postoperative bleeding) and 4 in TAVI (2 conversions due to dislocation, 1 patient needed mechanical reanimation and 1 emergency coronary stenting), p 0.5. Permanent pacemaker implantation was needed in 4 Sutureless patients and in 1 TAVI (10.8% vs 2.7%, P 0.18). A neurological event was recorded in 2 patients of each group. Predischarge echocardiographic data showed that the incidence of paravalvular leak was greater in the TAVI group (13.5% vs 0%, P 0.027).
CONCLUSIONS: The two strategies show good clinical outcomes and feasibility to face intraoperative complications. Sutureless showed a reduced mortality rate compared to TAVI, although without statistical significance. Minimally invasive Sutureless replacement is a safe approach with a significant lower incidence of paravalvular leakage.
7. Assessing Surgical Risk for Adults with Congenital Heart Disease: Are Pediatric Scoring Systems Appropriate?
Brian E. Kogon¹, Matthew Oster²
¹Emory University, Atlanta, GA; ²Sibley Cardiology, Atlanta, GA

DISCUSSANT: PHILLIP T. BURCH

OBJECTIVES: Patients with congenital heart disease are frequently surviving into adulthood, and many of them will require surgery. Currently, there is no validated risk scoring system for adult congenital heart surgery, and predicting outcomes in these patients is challenging. Our objective was to determine if commonly used pediatric congenital heart disease surgery risk scores are also applicable to adults.

METHODS: We retrospectively studied 458 adult patients (age ≥ 18 years) who underwent cardiac surgery for congenital heart disease between 2000 and 2010 at a single institution. The pediatric scores evaluated were the Risk Adjustment for Congenital Heart Surgery (RACHS) score, the Aristotle score, and the Society of Thoracic Surgery – European Association for Cardio-Thoracic Surgery (STAT) Congenital Heart Surgery Mortality score. ROC curves were generated to assess the ability of the scoring system to predict mortality, major adverse event (stroke, renal failure, prolonged ventilation, prolonged coma, deep sternal infection, reoperation, and operative mortality), and prolonged length of stay (>7 days).

RESULTS: Of 458 patients, 16 (3%) died, 94 (21%) suffered a major adverse event, and 90 (20%) had a prolonged length of stay. 430 (94%) patients underwent an operation that was included in all 3 scoring systems and were included in the ROC analysis. For mortality, ROC curve areas were 0.91, 0.91, and 0.65 for the Aristotle, STAT, and RACHS scores, respectively. For major adverse event, ROC curve areas were 0.81, 0.76, and 0.61 for the Aristotle, STAT, and RACHS scores, respectively. For prolonged length of stay, ROC curve areas were 0.82, 0.76, and 0.61 for the Aristotle, STAT, and RACHS scores, respectively.
CONCLUSIONS: Surgery in adults with congenital heart disease can be performed with low morbidity and mortality. Pediatric risk scoring systems can be predictive of mortality, major adverse events, and prolonged length of stay in adult congenital surgical patients. The Aristotle and STAT scoring systems are better than the RACHS system in predicting these adverse outcomes.
11:40 am – 12:30 pm  C. WALTON LILLEHEI
POINT/COUNTERPOINT SESSION

Bays 1-3

Time Out: Lists and Protocols Are the Best Method to Mitigate Human Error in the Hospital and Operating Room

Moderator:  Lawrence H. Cohn
Pro:  Matthew S. Slater
Con:  Thoralf M. Sundt

12:30 pm  ADJOURN

12:30 pm – 5:00 pm  WHITEWATER RAFTING EXCURSION**, Depart from Hotel Entrance

1:30 pm – 4:30 pm  HISTORICAL TOUR OF COEUR D’ALENE**, Depart from Hotel Entrance

6:00 pm – 10:00 pm  LEWIS AND CLARK THEME DINNER, Hagadone Event Center
(transportation departs from Boardwalk Marina, east side)

NOTES

** Separate Subscription Required
FRIDAY, JUNE 28, 2013

6:00 am – 12:00 pm  
**REGISTRATION**, Conference Center Registration

6:00 am – 12:00 pm  
**SPEAKER READY ROOM**, Beauty Bay

6:30 am – 7:50 am  
**BREAKFAST SESSION**

Casco Bay & Kidd Island Bay
CT Screening
Joshua R. Sonett

7:30 am – 8:00 am  
**BREAKFAST**, Bays 4-6

7:00 am – 11:00 am  
**FAMILY HOSPITALITY**, Boardroom 5ABC
7:00 am – 10:00 am  Breakfast Served
10:00 am – 11:00 am  Snacks & Beverages Served

7:30 am – 8:00 am  
**CONTINENTAL BREAKFAST, VISIT EXHIBITS**, Bays 4-6

7:30 am – 12:00 pm  
**EXHIBITS**, Bays 4-6

8:00 am – 8:40 am  
**POSTGRADUATE COURSE I**

Bays 1-3
Sponsored by: White Memorial Medical Center and Foundation—Lyman A. Brewer, III, Fund

**Medical Miracles Cost Money**
Geoffrey Sewell
Hawaii Permanente Medical Group

8:40 am – 9:20 am  
**POSTGRADUATE COURSE II**

Bays 1-3
How to Be Successful in the Accountable Care Organization (ACO) Movement
Francis J. Crosson
J. Scott Millikan
Dominic J. Tedesco

**Separate Subscription Required**
**8. Quantification of Emphysema with Preoperative Computed Tomography Predict Pulmonary Complication More Accurately Than Pulmonary Function Test After Lung Resection Surgery**

Kwon Joong Na, Chang Hyun Kang, Hey-Seon Kim, Jae-Hyun Jeon, Yong Won Seong, In Kyu Park, Jin Mo Goo, Young Tae Kim

*Seoul National University Hospital, Seoul, Korea, Republic of*

**DISCUSSANT: JESS D. SCHWARTZ**

**OBJECTIVES:** To evaluate whether volumetric percentile quantification of emphysema in preoperative chest CT have more accurate predictability of pulmonary complications than the preoperative pulmonary function test (PFT) after lung resection surgery.

**METHODS:** A retrospective review was performed for patients undergoing lung resection surgery and preoperative thin-section contrast chest CT scans from July 2009 to August 2011. The emphysema score (ES) was defined as volumetric percentage of low attenuation area (Hounsfield units < −950) in chest CT scan and was measured by automatic analysis software. Receiver operating characteristic (ROC) curve analysis was performed to compare predictability for pulmonary complications between ES and PFT. The patients were divided into two groups; patients with COPD (Group 1; n = 126, 40.9%) and without COPD (Group 2; n = 183, 59.1%). Univariate and multivariable analyses were performed to evaluate the predisposing preoperative factors for pulmonary complications.

**RESULTS:** A Total of 309 patients (mean age 64.1 ± 10.1 years) were included in this study. The operations performed were lobectomy (n = 280; 90.6%), bilobectomy (n = 21; 6.8%), and pneumonectomy (n = 8; 2.6%). Pulmonary complications occurred in 46 patients (14.9%); pneumonia in 29 (9.3%), atelectasis requiring bronchoscopy in 27 (8.7%), reintubation in 6 (1.9%), and tracheostomy in 3 (0.9%). Pulmonary complications occurred significantly more common in group 1 than group 2 (n = 35, 27.8% vs n = 11, 6.0%; p < 0.001). The mean ES was 9.44 ± 7.86 (range 0.04–3727).
and the it was significantly higher in the patients with pulmonary complications ($p < 0.001$). The area under curve (AUC), measured by using ROC curve analysis, was 0.837 for ES, 0.747 for FEV$_1$/FVC, 0.660 for FEV$_1$, and 0.599 for DLCO, and it was significantly higher in ES than other PFT values ($p < 0.05$). The cut off value of ES for predicting pulmonary complication was 13.5, and the sensitivity and specificity was 76.6% and 76.1%, respectively. Predisposing preoperative factors for pulmonary complications were found to be ES over 13.5, male sex, age over 70, and DLCO < 80% in all patients; ES over 13.5 and DLCO < 80% in group 1; ES over 13.5, male sex, age over 70 in group 2. However, other PFT values were not associated with pulmonary complications.

**CONCLUSIONS:** The emphysema score was found to be a significant risk factor for pulmonary complications after lung resection surgery and predicted pulmonary complications more accurately than other PFT values. Thus, the emphysema score may be a useful tool for assessing the risk of pulmonary complications after lung resection surgery.
9. Single Center Experience with the Frozen Elephant Trunk Technique in Complex Aortic Pathologies

Ferdinand R. Waldenberger¹, Gabriel Weiss¹,
Sandra Folkmann¹, Michael Gorlitzer¹,
Reinhard Moidl¹, Gerard Mertikian²,
Martin Grabenwoeger¹

¹Cardio-Vascular Surgical Center, General Hospital Vienna-Hietzing, Vienna, Austria; ²Radiology Department, General Hospital Vienna-Hietzing, Vienna, Austria

DISCUSSANT: R. SCOTT MITCHELL

BACKGROUND: Complex thoracic aortic pathologies affecting the aortic arch and proximal descending thoracic aorta remain a surgical challenge. The concept of antegrade open stent graft placement into the descending aorta was introduced as an adjunct procedure to conventional aortic arch reconstruction, aiming at a single-stage hybrid repair.

The goal of our study was to evaluate our operative and follow up data in the treatment of extensive aortic pathologies using the frozen elephant trunk (FET) technique.

METHODS: From April 2004 to December 2012 fifty-one patients were treated with FET for complex aortic pathologies. The group consisted of 30 males and 21 females. Mean age at surgery was 60 ± 11 years. Indications for surgery were acute type A dissections = 21, chronic type A dissections = 3, complicated type B dissections = 3, complex aortic aneurysms = 20, and penetrating aortic ulcers = 4, respectively.

The operative strategy was a combined surgical and endovascular approach (FET technique) using a hybrid prosthesis (Jotec Evita-open). All operations were performed under moderate hypothermic circulatory arrest (MHCA 25–28°C) and selective bilateral antegrade cerebral perfusion employing near-infrared spectroscopy monitoring.

RESULTS: All patients survived the procedure. Mean circulatory arrest time was 54 ± 12 minutes and mean time on CPB 198 ± 27 minutes. On average the ICU stay was 8 days(range 1–44 days) and the mean hospital stay 17 days, respectively. In 5 patients (9,8%) the procedure was completed by the means of an additional endovascular graft placement in the descending thoracic aorta.

2 patients (3.9%) died early postoperatively, two suffered a late death resulting in a total mortality of 7,8%.
5 patients developed symptoms of neurological dysfunction and 1 patient suffered a permanent stroke.

In 23 of 25 patients with postoperative computed tomography imaging (>6 months postoperatively), complete thrombus formation around the frozen elephant trunk was observed.

**CONCLUSIONS:** The FET technique proved feasible for the treatment of complex aortic pathologies involving the aortic arch and offers the advantage of a single-stage method. The promising postoperative results during follow-up encourage us to extend the indication for this treatment employing the frozen elephant trunk.

**Notes**
10:00 am  

**DAVID J. DUGAN DISTINGUISHED SERVICE AWARD PRESENTATION**  
Conferred to Edward D. Verrier, Seattle, Washington, by Douglas E. Wood  

10. Outcomes in Lung Transplantation Following Prior Lung Volume Reduction Surgery in a Contemporary Cohort  
*University of Washington, Seattle, WA*  
**DISCUSSANT: MICHAEL WEYANT**

**BACKGROUND:** Lung volume reduction surgery (LVRS) has demonstrated efficacy in palliation of symptoms and improved quality of life in select patients with end-stage chronic obstructive pulmonary disease (COPD). The influence of prior LVRS on subsequent outcomes in lung transplantation has been inadequately studied. We report our experience in the largest single institution series of a contemporary cohort undergoing these combined procedures.

**METHODS:** We reviewed 167 patients with end stage COPD who underwent lung transplantation at our center between 1995–2010, with 37 (22%) having prior LVRS. Clinical outcomes were compared between those patients undergoing lung transplant following LVRS with patients undergoing lung transplant alone during the same period. Perioperative outcomes were compared using chi-square test and long-term outcomes and survival analyses were performed with logrank tests and Kaplan-Meier method.

**RESULTS:** Mean follow up was 58.8 months for transplant alone and 49.4 months for lung transplant with prior LVRS. Prior LVRS patients were younger at the time of transplant than those undergoing transplant alone (58 vs 54 years, p = .0005). Demographics, comorbidities, and pre-transplant spirometry were similar between groups at the time of transplantation. Patients undergoing prior LVRS experienced longer operative times (4.2 vs 5.5 hours, p = 0.0318) and more transfusion requirement (median 0 vs 1.5 units packed red blood cells, p = 0.0445). Hospital length of stay and 30-day mortality were similar between groups as were rates of major morbidity. Overall survival was reduced in the group undergoing prior LVRS (p = .005). One year and 5 year survival was reduced in the LVRS group compared to transplant alone (85.4% vs 67.6%; p = 0.0319 and 64.8% vs 44.0%; p = 0.0288) although this did not reach statistical significance for 10 year survival (31.0% vs 17.3%, p = .1492).

*WTSA Member*
CONCLUSIONS: Patients undergoing lung transplant following prior LVRS experienced longer operative times and transfusion requirements however short and long-term clinical outcomes were similar. The finding of reduced overall survival in patients undergoing lung transplant following prior LVRS is in contrast to reports from other smaller series. The use of lung volume reduction surgery in patients who might also be considered for lung transplant requires careful consideration regarding its overall contribution to survival in end-stage COPD. Further analyses should be conducted to determine the overall benefit of LVRS for patients who otherwise meet criteria for lung transplantation.
11. Competence Versus Mastery: The Time Course for Developing Expertise in VATS Lobectomy
Mark K. Ferguson2, Xiao Li1, Jun Wang1
1Peking University People’s Hospital, Beijing, China; 2The University of Chicago, Chicago, IL
DISCUSSANT: DAVID T. COOKE

OBJECTIVES: VATS lobectomy is an advanced surgical procedure that has a vaguely defined learning curve for competency, whereas the development of true expertise (Dreyfus model) has not been evaluated. We compared learning curves for two surgeons experienced in open lobectomy to define the learning process for VATS lobectomy.

METHODS: The first 200 patients who underwent attempted VATS lobectomy/bilobectomy/segmentectomy by one senior surgeon at each of two institutions were evaluated for indications and outcomes. Data were abstracted from prospectively maintained databases. The learning curves were evaluated for operative time, complications, estimated blood loss (EBL), and postoperative length of stay (LOS) using the moving average method; means for the final 50 cases for each surgeon were used as par values. Conversion rates over time were compared with chi squared analysis.

RESULTS: Some differences existed between the two patient populations: Surgeon A patients were somewhat younger (57.4 ± 14.0 vs 66.0 ± 10.7; p < 0.001), were slimmer (BMI 24.0 ± 3.3 vs 27.7 ± 6.1; p < 0.001), were more often male (49% vs 38%; p = 0.044), and had a lower incidence of coronary artery disease (8% vs 19%; p = 0.001). Conversion to open was required in 6% and 12% (p = 0.016); rates were consistently <10% for Surgeon A and decreased to <10% after 100 operations for Surgeon B. Operation time (mean 188 ± 59 vs 181 ± 49; p = 0.16) reached a steady state for each surgeon after 100 cases, and times were maintained within 1 standard deviation of the mean after 170 cases for each surgeon (Figure). EBL (223 ± 226 vs 195 ± 179 ml; p = 0.14) and LOS (9.8 ± 3.9 vs 4.5 ± 3.5; p < 0.001) decreased over time but did not reach a steady state within 200 operations for either surgeon. Complications rates were lower for Surgeon A than Surgeon B (10% vs 24%; p < 0.001) but no trend in complications over time was identified for either surgeon.
CONCLUSIONS: Despite some differences in patient presentation and outcomes, the learning curves were strikingly similar for both surgeons. Between 100 and 200 cases are required to achieve steady state outcomes for VATS lobectomy in terms of operative time, reflective of acquired expertise. Mean estimated blood loss and length of stay continue to decrease even up to 200 cases.
12. Transposition of Great Arteries and Intact Ventricular Septum—Outcomes and Time Interval of Early Neonatal Repair

*Michael T. Cain2, Ronald K. Woods1, Katie Trapp3, Pippa M. Simpson1, Yumei Cao1, Nancy S. Ghanayem1, James S. Tweddell1

1Children’s Hospital Wisconsin, Medical College of Wisconsin, Milwaukee, WI; 2Medical College of Wisconsin, Milwaukee, WI; 3Children’s Hospital Wisconsin, Milwaukee, WI

Discussant: John J. Lambert

OBJECTIVES: For patients with d-TGA/IVS, there is limited data evaluating the dependence of arterial switch outcomes on timing of repair in the early neonatal period. Deferring repair beyond the first few days of dynamic physiological change might result in a more favorable response to surgical stress. However, earlier repair might result in less inpatient days and less resource utilization. This study investigates the relationship of morbidity and resource utilization with timing of early neonatal repair.

METHODS: All patients diagnosed with d-TGA/IVS who underwent surgical correction between January 2000 and May 2011 were retrospectively reviewed. Patients undergoing repair at ≤4 days of age were categorized as Group I; 5–7 days as Group II; and 8–30 days as Group III. Outcomes included mortality; various measures of morbidity (cardiac arrest or ECLS, duration of mechanical ventilation, length of stay (LOS), neurological deficit, renal failure, infection, re-intervention); and total hospital charges. Patient characteristics with potential to influence timing of repair were included in the statistical analysis.

RESULTS: This cohort of 87 patients included 26 patients in Group I; 37 in Group II; and 24 in Group III. Overall hospital survival was 86/87 (99%), with 1 death occurring after hospital discharge. On univariate analysis of preoperative characteristics, there was no difference among groups in the incidence of infection, shock/acidosis, mechanical ventilation, inotrope use, renal failure, or prematurity. Postoperatively, infection occurred in 4 (15%) in Group I; 6 (16%) in Group II; and 10 (42%) in Group III (p = 0.05). Total length of stay was significantly different: Group I–14 days; Group II–18 days; and Group III–21 days (p = 0.01). Total charges were also different: Group I–$128297; Group II–$149308; and Group III–$199114 (p = 0.002).

* WTSA Member
Using logistic regression to account for variables likely to impact timing of surgery, older age group remained associated with postoperative infection (p = 0.03). Preoperative mechanical ventilation (p = 0.03), shock/acidosis (p = 0.02), and inotrope use (p = 0.05) were also associated with infection. For all measures of morbidity, Group I was not associated with inferior outcomes.

CONCLUSIONS: Earlier neonatal repair of TGA/IVS was not associated with increased morbidity, and was associated with a lower incidence of postoperative infection and decreased length of hospital stay and charges. Further analysis based on a larger cohort of patients and additional measures of morbidity is warranted to verify the apparent lack of detriment to repair in the first four days of life and the potential implications for quality improvement measures to reduce infection and overall resource utilization.

11:00 am – 11:30 am COFFEE BREAK, VISIT EXHIBITS & POSTERS, Bays 4-6

NOTES
13. Evolution of a Ventricular Assist Device Program in a Large Children’s Hospital

Charles D. Fraser, Jr., Muhammad S. Khan, Charles D. Fraser, III, Iki Adachi, Jeffrey S. Heinle, Carlos M. Mery, Jack F. Price, Emmett D. McKenzie

Texas Children’s Hospital, Baylor College of Medicine, Houston, TX

DISCUSSANT: DAVID M. MCMULLAN

OBJECTIVE: Until recently, there was no Food and Drug Administration approved small, child-specific ventricular assist device (VAD) available in the United States. With the approval of a pediatric, paracorporeal, pulsatile-flow VAD and more VADs undergoing investigation, the field continues to evolve. The aim was to look at the evolution of VAD program in a large children’s hospital and the impact on outcomes.

METHODS: Retrospective review patients undergoing mechanical circulatory support with a VAD from June 1995–June 2012 was completed. The cohort included shortterm VADs (<14 d of support) – [transthoracic, centrifugal, paracorporeal: 36], [percutaneous, paracorporeal: 3] and longterm VADs (≥14 d of support) – [paracorporeal, pulsatile-flow: 32], [intracorporeal, axial-flow: 13], [adult, paracorporeal, pulsatile-flow: 12], [pediatric, intracorporeal, pulsatile-flow: 3], and total artificial heart: 1.

RESULTS: Eighty-two patients were supported by 100 VADs. The median age and weight at implantation was 7.8 y (2 d–23 y) and 21.1 kg (2.7–130 kg). Of the total VADs implanted, 83 (90%) were used to support the failing left ventricle (LV), 2 (2%) were used to for the right ventricle (RV) and 8 (8%) were used for biventricular support. Shortterm VAD support was required in 35 (37%) patients and longterm VAD support in 57 (61%), while 2 (2%) had biventricular support via a longterm device for the LV and shortterm VAD for the RV. Primary diagnoses were cardiomyopathy (54%), congenital heart disease (38%), myocarditis (4%) and graft vasculopathy (4%). The median duration of support on the shortterm VAD was 5 d (0–19 d) and for longterm VADs was 62 d (2–411 d). For shortterm VADs, 9 patients (26%) were successfully bridged to a longterm support, 15 (43%) were weaned to recovery and 2 (6%) were bridged to transplant. There were 9 (25%) deaths on shortterm VADs.
For longterm VADs, 46 patients (81%) were bridged to transplantation, 9 (15%) died on the VAD, 1 (2%) patient was weaned to recovery, and 1 (2%) is still on a longterm VAD. The survival for patients that underwent heart transplantation or were weaned to recovery was 1 y–92%, 3 y–85% and 5 y–85%.

CONCLUSIONS: There is high mortality on shortterm VADs. Transition of support to a longterm device is warranted. With advancement of technology and cumulating experience in the VAD program, the outcomes for the patients supported by a VAD continue to improve.
**+14. An Individual’s Frame of Reference Influences Ability to Determine Accurate Needle Angles**

Ahmad Y. Sheikh$^1$, Madeleine Keehner$^2$, Audrey Walker$^3$, Paul A. Chang$^1$, *Thomas A. Burdon$^1$, *James I. Fann$^1$

$^1$Stanford University, Stanford, CA; $^2$ETS, Princeton, NJ; $^3$University of Dundee, Dundee, United Kingdom

**DISCUSSANT: CRAIG J. BAKER**

**OBJECTIVES:** Few studies link principles of cognitive psychology with surgical task execution. When an individual performs a spatial task, he uses information from three possible frames of reference (environment, object, and one’s body) to plan actions and update mental representations of himself relative to the object on which he is working. We investigated whether frame of reference and field independence (i.e. ability to accurately assess the spatial orientation of the object of interest regardless of surrounding cues/objects) influence the ability to understand needle angles and optimize suture placement in a simulated setting.

**METHODS:** Twelve cardiothoracic surgery residents of varying levels of experience (PGY1-8) underwent a battery of 5 written cognitive psychological exams designed to assess general reasoning, spatial visualization, and spatial judgment. Of the two spatial judgment tests, Rod and Frame Test (RAF) evaluated the ability to mentally “separate” a stimulus from surrounding cues/objects, and Judgment of Line Orientation Test (JOLOT) assessed the skill of finding a match between the angles of two lines separated in space and if two lines are not at precisely the same angle. Residents then completed 10 needle “swings” at pre-selected positions with marked entry and exit sites of a cylindrical silicone mitral valve model; the model configuration and plane of annulus require awareness of needle orientation on the needle driver to optimize suture placement. Performance was recorded and assessed by two senior surgeons blinded to participant identity using a 5-point rating scale.

**RESULTS:** Performance on the spatial judgment tests correlated strongly with proper loading of needle for optimal needle angle (needle load): JOLOT vs. needle load ($R = 0.61, p < 0.05$) and RAF vs. needle load ($R = 0.52, p < 0.05$), suggesting that residents who were field-independent (not distracted by surrounding cues/objects) in their frame of reference performed better (Figure). Correlations between cognitive exams and needle load were independent of resident training level and free of “test-taking” bias as assessed by internal testing controls.

* Samson Resident Prize Essay
* WTSA Member
CONCLUSIONS: Spatial judgment and frame of reference tests indicate that field-independence may be predictive of skills performance, such as demonstrating proper needle angles, during training. These findings suggest that directed communication between educator and resident and developing training tools to improve understanding of frame of reference may enhance technical skills performance. Future studies are necessary to determine how frame of reference may influence acquisition of surgical skills over time and with increased experience.
15. **Should Surgical Ablation for Atrial Fibrillation Be Performed in Patients with Significantly Enlarged Left Atrium?**  
*Niv Ad, Linda Henry, Sharon Hunt, Sari D. Holmes*  
*Inova Heart and Vascular Institute, Falls Church, VA*

**DISCUSSANT: SURINDRA N. MITRUKA**

**OBJECTIVE:** One of the well established predictors for failure of surgical ablation for atrial fibrillation is increased left atrial (LA) size (>5.5 cm). The perception among surgeons is that surgical ablation in these patients is highly ineffective and should not be performed. There is no clear data whether certain LA dimensions are related to results and thereby prohibit surgical ablation. The purpose of this study was to determine if LA size >5.5 cm carries a risk for recurrent atrial arrhythmia and embolic events following surgical ablation.

**METHODS:** A total of 373 patients with surgical ablation without LA reduction surgery were available. LA size was measured via transthoracic echocardiography within 6 months prior to surgery. The impact of LA size (as a continuous measure) on rhythm status was analyzed via logistic regression. Two groups were also formed based on LA size: large (>5.5 cm; n = 83) and small (≤5.5 cm; n = 290) and were compared for different outcomes.

**RESULTS:** The large LA group was younger (p = 0.02), had lower operative risk (euroSCORE, p = 0.01), had fewer patients with diabetes mellitus (p = 0.02) and hypertension (p = 0.02), had lower EF (p = 0.03) and had significantly more concomitant mitral valve surgery (p < 0.001). There was no difference in type (p = 0.51) or duration of AF between the groups (p = 0.93). Both groups showed similar rates of sinus rhythm (SR) at 12 months off class I/III anti-arrhythmic drugs (AAD) at 1 year (77% [LA > 5.5 cm] vs 85%, p = 0.10). A multivariate analysis in the large LA size group found that longer duration of AF (years) was the only independent predictor for AF at 1 year (OR = 1.22, p = 0.04). By 2 years, there was no difference between groups on SR off AAD (Large: 73% vs 81%, p = 0.28). Patients with LA size >7.5 cm showed reasonable rates of SR at 1 year (86%) and SR off AAD (71%).

Predicted probability of failure at 1 year was 43% greater with each 1 point increase (range 2.2–11.0) in LA size (OR = 1.43, p = 0.02). Predicted probability of failure at 1 year off AAD was 30% greater with each 1 point increase in LA size (OR = 1.30, p = 0.03; FIGURE). Freedom from embolic stroke during follow-up was found to be similar (Log Rank = 0.15, p = 0.70) despite the majority of patients (70%) for both groups being off warfarin at 12 months. The large LA group did not require more cardioversions (23% vs 18%, p = 0.34) during follow-up.
CONCLUSIONS: The large left atrium group had an acceptable return to sinus rhythm as well as SR off AAD. In addition, embolic stroke events were low in both LA size groups despite the majority of patients no longer anticoagulated. If patients are managed appropriately post-ablation, acceptable results can be expected with the added advantage of lower risk of stroke and need for anticoagulation. Our findings suggest that LA size should not be a discouragement when evaluating a surgical candidate with atrial fibrillation.
12:30 pm  ADJOURN

2:00 pm  GOLF TOURNAMENT**, Coeur d’Alene Golf Course

2:00 pm  TENNIS TOURNAMENT**, Coeur d’Alene Tennis Courts
Transportation for both the Golf and Tennis Tournaments
begins departing from the Eagle Shuttle Marina, west
end, at 12:45 pm.

EVENING — FREE

NOTES

** Separate Subscription Required
SATURDAY, JUNE 29, 2013

6:00 am – 11:30 am  **SPEAKER READY ROOM**, *Beauty Bay*

6:00 am – 12:00 pm  **REGISTRATION**, *Conference Center Registration*

6:30 am – 7:30 am  **BREAKFAST**, *Bays 4-6*

6:30 am – 10:30 pm  **EXHIBITS**, *Bays 4-6*

7:00 am – 8:15 am  **CONCURRENT FORUMS**

*(5 minutes presentation, 3 minutes discussion)*

ADULT CARDIAC

*Bays 1-3*

Moderators: David A. Fullerton
Craig H. Selzman

CF1. **Modeling Frailty and Risk in Proximal Aortic Surgery**


*Duke University Medical Center, Durham, NC*

**OBJECTIVES:** Although frailty has recently been examined in various populations as a predictor of morbidity and mortality, its impact on thoracic aortic surgery outcomes has not been studied. The objective of this study was to evaluate the role of frailty, as represented by a frailty index score, in predicting post-operative morbidity and mortality in patients undergoing proximal aortic replacement surgery.

**METHODS:** Retrospective analysis of a prospectively maintained IRB-approved database was performed for all patients undergoing elective and non-elective proximal aortic operations (root, ascending aorta, and/or arch) at a single referral institution between 6/2005 and 7/2012. N = 560 patients were identified with proximal aortic surgery, of which 553 were included for analysis (98.8%); 7 patients were excluded due to incomplete data. Frailty was evaluated using an index consisting of: age >70, body mass index (BMI) <18.5, anemia (<12.0 g/dL for females, <13.0 g/dL for males), history of stroke, hypoalbuminemia (<3.5 g/dL), and total psoas volume

* WTSA Member
(TPV) in bottom quartile of population. One point was given for each criterion met to determine a frailty score from 0–6 (any missing value was considered normal). Frailty was defined as a score of 2 or greater. Risk models for length of stay (LOS) >14 days, discharge to destination other than home, 30-day composite major morbidity, 30-day composite major morbidity/mortality, and 30-day and 1-year mortality were calculated using univariate and multivariate regression modeling. Composite 30-day major morbidity was defined using the standard STS definition including reoperation, prolonged mechanical ventilation, acute renal failure, new onset dialysis, stroke, discharge to destination other than home, or LOS >14 days.

**RESULTS:** N = 139 (25.1%) patients were defined as frail (frailty score ≥2). Mortality for the entire cohort (n = 553) at 30 days and 1 year was 3.4% (n = 19) and 6.9% (n = 38), respectively. Incidence of 30-day composite major morbidity was 19.4% (n = 107) and 30-day composite major morbidity/mortality was 21.0% (n = 116). 8.1% (n = 45) of patients had LOS >14 days and 6.5% (n = 36) were discharged to a location other than home. Frailty score ≥2 was statistically associated with all outcomes on univariate analysis (Table 1). In the multivariate model, frailty score ≥2 was associated with discharge to other than home, and 30-day and 1-year mortality. Other statistically significant predictive variables for 30-day and/or 1-year outcomes are displayed in Table 2.

**CONCLUSIONS:** Frailty, as defined using a 6-component frailty index, serves as an independent predictor of discharge disposition and early and late mortality risk in proximal aortic surgery. These frailty markers, all of which are easily assessed preoperatively, may provide valuable information with regards to patient counseling and risk stratification prior to proximal aortic replacement.

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratio (OR)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Stay &gt;14 Days</td>
<td>3.37</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Discharge to Other Than Home</td>
<td>4.77</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Composite 30-Day Major Morbidity</td>
<td>1.75</td>
<td>0.014</td>
</tr>
<tr>
<td>Composite 30-Day Major Morbidity/ Mortality</td>
<td>2.04</td>
<td>0.001</td>
</tr>
<tr>
<td>30-Day Mortality</td>
<td>5.74</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>1-Year Mortality</td>
<td>5.29</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Table 2: Multivariate Predictors of Outcome in Proximal Aortic Replacement (*Non-Significant)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>LOS &gt;14 Days (OR; p-Value)</th>
<th>Discharge to Other Than Home (OR; p-Value)</th>
<th>30-Day Composite Morbidity (OR; p-Value)</th>
<th>30 Day Major Morbidity/Mortality (OR; p-Value)</th>
<th>30-Day Mortality (OR; p-Value)</th>
<th>1-Year Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frail Status (Frailty Score ≥2)</td>
<td>*</td>
<td>2.56 (0.014)</td>
<td>*</td>
<td>*</td>
<td>4.28 (0.004)</td>
<td>4.65 (&lt;0.001)</td>
</tr>
<tr>
<td>ASA Class = 4</td>
<td>*</td>
<td>3.20 (0.003)</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Baseline Creatinine &gt;1.5 g/dL</td>
<td>3.89 (&lt;0.001)</td>
<td>3.98 (&lt;0.001)</td>
<td>*</td>
<td>1.93 (0.034)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Concomitant Cardiac Surgical Procedure</td>
<td>4.31 (&lt;0.001)</td>
<td>*</td>
<td>3.38 (&lt;0.001)</td>
<td>3.06 (&lt;0.001)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Female Sex</td>
<td>2.19 (0.035)</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Maximum Aortic Diameter</td>
<td>*</td>
<td>1.33 (0.013)</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Non-Elective Procedure Status</td>
<td>4.38 (&lt;0.001)</td>
<td>*</td>
<td>3.73 (&lt;0.001)</td>
<td>3.40 (&lt;0.001)</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Presence of Aortic Dissection</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>3.64 (0.011)</td>
<td>2.63 (0.001)</td>
</tr>
<tr>
<td>Total Arch Surgery</td>
<td>11.82 (&lt;0.001)</td>
<td>*</td>
<td>3.96 (&lt;0.001)</td>
<td>4.90 (&lt;0.001)</td>
<td>5.09 (0.003)</td>
<td>8.62 (&lt;0.001)</td>
</tr>
</tbody>
</table>
OBJECTIVES: Valve-sparing aortic root replacement (V-SARR) has become an established treatment for patients with bicuspid aortic valve (BAV) and aortic aneurysm. The role of commissure orientation on downstream blood flow patterns and ascending aortic wall shear stress in BAV patients after V-SARR, however, remains unknown.

METHODS: 19 BAV patients after V-SARR (9 Sievers’ type 1/L-R valves and 10 Sievers’ type 0/LAT), were imaged using time resolved 3-D phase contrast MRI. All studies were performed using a 3T magnet after administration of gadofosveset at a dose of 0.03 mmol/kg (Ablavar, Lantheus Medical Imaging). Flow data were visualized using EnSight100 (CEI Software) using streamlines and vector fields. Planes placed perpendicular to the axis of the ascending aorta at the level of the pulmonary artery were exported and wall shear stress was calculated. Student’s t-test was used to compare groups with p < 0.05 considered significant.

RESULTS: Qualitatively, Sievers’ type 1/L-R patients had more eccentric systolic jets resulting in a higher degree of helical flow in the ascending aorta (Figure 1: 7/10 Sievers’ 0/LAT patients had normal laminar flow, while only 1/9 Sievers’ 1/L-R patients had laminar flow in the ascending aorta). Note how the aortic jet oriented along the inner curvature in the 0/LAT patients results in laminar flow with low shear stress along the outer curvature, while the jet oriented along the outer curvature in the 1/L-R patients results in helical flow and markedly elevated wall shear stress along the outer curvature where the jet impacts along the wall. Adding to the effect of the eccentric jets, patients with Sievers’ type 1/L-R BAVs had significantly higher peak systolic velocities across the aortic valve measured with echocardiography (180 cm/s vs. 263 cm/s, p = 0.01). Peak systolic wall shear stress along the outer curvature of the mid-ascending aorta was higher in Sievers’ type 1/L-R patients (1.6 N/m vs. 1.0 N/m, p = 0.03).

* WTSA Member
CONCLUSIONS: After V-SARR, BAV valve-morphology has a dramatic impact on the pattern of blood flow and wall shear stress in the ascending aorta. This provides further support that valve morphology creates distinct, but overlapping, subsets of BAV patients with different risks for aneurysmal dilatation.
OBJECTIVES: Surgical outcomes for acute type A aortic dissection (AAAD) are influenced by the extent of dissection and the preoperative clinical presentation, including organ malperfusion and hemodynamic abnormalities. The Penn classification, a recently developed risk assessment system for AAAD, is based on preoperative ischemic conditions. We investigated whether Penn classes predict outcomes after surgery for AAAD.

METHODS: Subjects were 351 consecutive patients with DeBakey type I or retrograde type IIIa or b (IIIR) AAAD treated surgically between January 1997 and January 2011. To maintain homogeneity of the patient group, patients with DeBakey type II AAAD (AAAD not involving the descending thoracic aorta) were not included. Patients were divided into 4 groups per Penn class: Aa (absence of ischemia, n = 187), Ab (localized ischemia with branch vessel malperfusion, n = 67), Ac (generalized ischemia with circulatory collapse, n = 46), and Abc (localized and generalized ischemia with branch vessel malperfusion and circulatory collapse, n = 51). Early and late outcomes were compared between groups.

RESULTS: There was no between-group difference in age, sex, genetic background, or comorbidities. CABG was associated with Penn classes Ac and Abc, with significant differences in cardiopulmonary bypass time, myocardial ischemia time, and blood transfusion volume between the 4 groups. Overall in-hospital mortality was 8.3% (29/351): 3% (6/187) for Penn Aa, 6% (4/67) for Penn Ab, 17% (8/46) for Penn Ac, and 22% (11/51) for Penn Abc. Multivariate logistic regression analysis showed Penn Ac and Abc to be independently associated with an increased risk of in-hospital mortality, which was also predicted by other variables, including operation time >6 hours and DeBakey type IIIR dissection (Table 1). Median ICU and hospital stays were longer, and the incidences of neurologic and respiratory complications were higher in the Penn Ac and Abc groups than in the other two groups (Table 2). Postoperative serum transaminase levels remained elevated in hospital survivors, regardless of Penn class (Figure 1). Actuarial survival at 10 years was 73.8% in the Penn Aa group, 70.5% in the Penn Ab group, 57.6% in the Penn Ac group (P = 0.023 vs. Penn Aa), and 46.0% in the Penn Abc group (P < 0.001 vs. Penn Aa) (Figure 2).
Table 1: Results of Multivariate Logistic Regression Analysis for Factors Predictive of In-Hospital Mortality

<table>
<thead>
<tr>
<th>Variable</th>
<th>P Value</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penn class Abc</td>
<td>&lt;0.001</td>
<td>6.74</td>
<td>2.57–17.68</td>
</tr>
<tr>
<td>Penn class Ac</td>
<td>0.004</td>
<td>4.58</td>
<td>1.64–12.77</td>
</tr>
<tr>
<td>Operation time &gt;6 hours</td>
<td>0.006</td>
<td>3.59</td>
<td>1.44–8.91</td>
</tr>
<tr>
<td>DeBakey IIIR dissection</td>
<td>0.016</td>
<td>2.83</td>
<td>1.21–6.59</td>
</tr>
</tbody>
</table>

Table 2: Length of Stays and Complications Per Penn Classes

<table>
<thead>
<tr>
<th>Variable</th>
<th>Penn Class Aa (n = 187)</th>
<th>Penn Class Ab (n = 67)</th>
<th>Penn Class Ac (n = 47)</th>
<th>Penn Class Abc (n = 51)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median length of ICU stay, day (Q1, Q3)</td>
<td>5 (4–7)</td>
<td>6 (4–9)</td>
<td>6 (4–8)</td>
<td>6.5 (4.0–10.3)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Median length of hospital stay, day (Q1, Q3)</td>
<td>22 (17–29)</td>
<td>22 (17–31)</td>
<td>23 (15–30.5)</td>
<td>24 (15–36)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Complications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding requiring re-exploration</td>
<td>3% (6/187)</td>
<td>8% (5/67)</td>
<td>9% (4/46)</td>
<td>9% (4/46)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Neurological deficit(s)</td>
<td>3% (5/187)</td>
<td>10% (7/67)</td>
<td>13% (5/46)</td>
<td>22% (11/51)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Postoperative shock requiring ECMO</td>
<td>0% (0/187)</td>
<td>3% (2/67)</td>
<td>9% (4/46)</td>
<td>6% (3/51)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Prolonged mechanical ventilation (&gt;48 hours)</td>
<td>31% (57/187)</td>
<td>43% (29/67)</td>
<td>46% (21/46)</td>
<td>55% (28/51)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Respiratory distress requiring tracheostomy</td>
<td>2% (3/187)</td>
<td>8% (5/67)</td>
<td>4% (2/46)</td>
<td>10% (5/51)</td>
<td>0.03</td>
</tr>
</tbody>
</table>
CONCLUSIONS: Penn classes Ac and Abc were shown to be independent predictors of in-hospital mortality; patients with hemodynamic instability experienced prolonged ICU and hospital stays, high incidences of morbidity, and poorer long-term outcomes. The Penn classification appears to be a useful risk assessment system for AAAD, predictive of surgical outcomes.
BACKGROUND: Pulmonary thromboendarterectomy (PTE) surgery is technically challenging. Due to limited visibility in the operative field learning the required skills from mere observation is challenging. Few analogous procedures exist for skill transfer and no simulator training is available. Training in the technique requires increasing periods of independent surgery with careful inspection and critique of performed dissection by a senior surgeon. We report the outcomes of pulmonary thromboendarterectomy surgery performed by a junior surgeon.

METHODS: Retrospective review of PTE cases performed between August 2010 and October 2012 at our center identified 201 cases where a junior surgeon was scrubbed. One hundred and nineteen cases were performed as assistant surgeon with senior surgeon supervision (group 1) and subsequent 82 cases as primary surgeon without supervision (group 2). Two-sided paired t test and Wilcoxon signed rank test compared pre-, intra- and post-surgery variables between groups.

RESULTS: Both groups were similar for the presence of pre-operative hypertension, renal failure, cerebrovascular disease, peripheral vascular disease, atrial fibrillation, obesity and smoking history. Group 2 patients had a higher incidence of diabetes mellitus (5.9% vs. 17.1% p = 0.017) and history of pulmonary embolism (56.3% vs. 75.6% p = 0.006). There was no difference between groups for left ventricular ejection fraction (66% vs. 67.3%; p = 0.75), pulmonary vascular resistance (PVR) (687.2 vs. 687.4; p = 0.99) or cardiac output (4.4 vs. 4.6 L; P = 0.4) before surgery. Both groups had a similar incidence of previous sternotomy (4.2% vs. 2.4%; p = 0.78). The need for combined coronary bypass and PTE surgery were similar for both groups (5.9% vs. 6.1%; p = 0.99). Cardiopulmonary bypass time (269.4 vs. 269.5 min; p = 0.98) was similar but circulatory arrest time (45.8 vs. 59.8 min; p = 0.001) and cross clamp time (130.6 vs. 148.4 min; p = 0.001) was longer in group 2. Embolic disease distribution was similar for both groups. Decrease in mean PVR was similar (475.1 vs 472.8 dynes.sec.cm–5; P = 0.97).

Incidence of reperfusion injury (8.4% vs. 6.1%; p = 0.59) and the need for reoperation due to bleeding (1.7% vs. 3.7%; p = 0.4) was similar for both groups. Median days ICU stay (5.0 vs. 4.0; p = 0.55) and hospital stay (14.0 vs.12.0; p = 0.66) were also similar for both groups. Thirty day mortality was absent in either group. One hospital mortality occurred 65 days post PTE surgery in group 2 following an intra cranial bleed requiring multiple craniotomy surgeries.

* WTSA Member
CONCLUSIONS: Pulmonary thromboendarterectomy surgery can be taught safely in a high volume center. Adequate training in PTE surgery results in excellent outcomes. We recommend one hundred cases in training to achieve superior results for PTE surgery. Long term follow up is required to assess long term survival post PTE surgery for this cohort.
OBJECTIVE: Due to its durability, mechanical valve is typically chosen for young patients undergoing mitral valve replacement (MVR). However, bioprosthetic valve may have the benefit of valve-in-valve transcatheter valve replacement when valve failure occurs. We examined the outcomes in patients who had mechanical valve (MVRm) versus bioprosthetic valve (MVRb) in patients under age of 65.

METHODS: A total of 768 consecutive patients <65 yo who underwent MVR between Jan 1991 and June 2012 were identified. Propensity matching was used to derive a case-control subset for analysis. Long term outcomes were collected by chart review, routine patient follow up and query of the Social Security Death Index. Postoperative and long term outcome of interest included combined stroke and embolic events, reoperations, and mortality.

RESULTS: Of 768 consecutive patients, 627 were in the MVRm and 141 in the MVRb group. Propensity score matching yielded a cohort of 125 MVRb (89%) and 125 control MVRm patients with similar etiology mixes. The groups were similar in age (MVRm 53.2 ± 9.0 yr vs MVRb 53.8 ± 10.6 yr, p = 0.617), percent females, prior cardiac surgery, and other preoperative characteristics. Postoperatively, rates of reoperation for bleeding, redo valve, permanent stroke, and surgical infections did not differ significantly (all p < 0.2). Median Length of stay (9 d both groups, p < 0.82) and operative mortality (MVRm 5.6% vs MVRb 8.0% p = 0.617) were also similar. Kaplan-Meier analysis of long term outcomes revealed that the estimated postoperative survival for MVRb was significantly shorter than MVRm (MVRm 13.5 yr vs MVRb 11.3 yr, p = 0.004). MVRb group was at significantly higher risk of reoperation (Figure 1, p = 0.001) while the combined risk of stroke/embolic event between these groups were similar. Survival without reoperation or stroke/embolism was significantly shortened for the MVRb cohort (Figure 3, MVRm 204 mo vs MVRb 195 mo, p = 0.017).
### Table: Comparison of Mechanical and Bioprosthesis

<table>
<thead>
<tr>
<th></th>
<th>Mechanical</th>
<th>Bioprosthesis</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>51.8 (9.7)</td>
<td>54.5 (10.3)</td>
<td>0.03</td>
</tr>
<tr>
<td>Female</td>
<td>57.7 (20.5)</td>
<td>55.3 (20.9)</td>
<td>0.30</td>
</tr>
<tr>
<td>Renal failure</td>
<td>9.9 (2.4)</td>
<td>17.7 (25.7)</td>
<td>0.012</td>
</tr>
<tr>
<td>Preop creatinine</td>
<td>1.31 (1.5)</td>
<td>1.34 (1.1)</td>
<td>0.766</td>
</tr>
<tr>
<td>Ejection fraction (%)</td>
<td>89 (59.5%)</td>
<td>10 (22.5%)</td>
<td>0.767</td>
</tr>
<tr>
<td>NYHA class IV</td>
<td>64.1 (139)</td>
<td>19.6 (74)</td>
<td>0.779</td>
</tr>
<tr>
<td>Prior CABG</td>
<td>6.4 (46)</td>
<td>8.7 (42)</td>
<td>0.256</td>
</tr>
<tr>
<td>Prior valve</td>
<td>18.8 (19)</td>
<td>18.4 (21.5)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

### Operative data

<table>
<thead>
<tr>
<th></th>
<th>Mechanical</th>
<th>Bioprosthesis</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimally invasive</td>
<td>5.9 (27)</td>
<td>2.9 (24)</td>
<td>0.311</td>
</tr>
<tr>
<td>Concurrent CABG</td>
<td>15.3 (15)</td>
<td>22.0 (21)</td>
<td>0.042</td>
</tr>
<tr>
<td>Preop time (min)</td>
<td>198 (219-217)</td>
<td>198 (121-217)</td>
<td>0.158</td>
</tr>
<tr>
<td>Cross-clamp time (min)</td>
<td>106 (75-106)</td>
<td>147 (87-103)</td>
<td>0.895</td>
</tr>
</tbody>
</table>

### Postoperative outcomes

<table>
<thead>
<tr>
<th></th>
<th>Mechanical</th>
<th>Bioprosthesis</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reop for bleeding</td>
<td>4.6 (29)</td>
<td>5.0 (7)</td>
<td>0.827</td>
</tr>
<tr>
<td>Reop valve</td>
<td>0.4 (1)</td>
<td>0.0 (0)</td>
<td>0.000</td>
</tr>
<tr>
<td>Permanent occluder</td>
<td>7.2 (14)</td>
<td>5.7 (8)</td>
<td>0.044</td>
</tr>
<tr>
<td>DVT</td>
<td>0.6 (4)</td>
<td>0.1 (1)</td>
<td>0.070</td>
</tr>
<tr>
<td>Sepsis</td>
<td>1.1 (1)</td>
<td>3.3 (6)</td>
<td>0.015</td>
</tr>
<tr>
<td>MSCE</td>
<td>0.6 (4)</td>
<td>0.8 (1)</td>
<td>0.070</td>
</tr>
<tr>
<td>LOS (days)</td>
<td>8 (8-15)</td>
<td>9 (0-17)</td>
<td>0.030</td>
</tr>
</tbody>
</table>

### Estimated survival (yrs)

<table>
<thead>
<tr>
<th></th>
<th>Mechanical</th>
<th>Bioprosthesis</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.5 (29)</td>
<td>4.5 (12)</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>16.5 (16)</td>
<td>15.5 (16)</td>
<td>0.047</td>
</tr>
</tbody>
</table>

### Figure 1. Time to reoperation

\[ p = 0.001 \]
Figure 2. Time to Stroke or Embolic Event
CONCLUSION: In this report, bioprosthetic MVR under the age of 65 was associated with high rate of reoperation and decreased survival. Although future transcatheter valve-in-valve technique in failed bioprosthetic valve may reduce the risk of reoperation, this finding confirms the safety of mechanical valves in this group.
OBJECTIVE: Retrograde dissection is now recognized as an important complica-
tion after thoracic endovascular aortic repair (TEVAR), but its treatment is poorly
understood. Objectives were to investigate risks, describe repair methods and assess
outcomes of this complication.

METHODS: From 2000 to 2012, 766 patients underwent TEVAR, and 13 (1.7%)
developed retrograde dissection after stent grafting for distal aortic dissection (n = 5),
imtramural hematoma (n = 5), aneurysm (n = 2) and transection (n = 1). Mean age
was 67 ± 9 years. At the time of initial TEVAR, left subclavian artery was covered in 7,
mean stent graft diameter was 32 ± 2 mm and more than one device was used in 8
patients. Site of entry tear was at the greater curvature in 10 and lesser curvature in 3.

One patient ruptured and died 17 days post TEVAR and never made it the operating
room. The other 12 plus one patient who had TEVAR elsewhere underwent proximal
aortic repair and constitute the population of this study. Median interval between
TEVAR and repair of retrograde dissection was 15 months; 2 patients presented
within one month. Repair techniques included: reverse frozen elephant trunk (n = 5),
total arch repair (n = 3), ascending or hemiarch repair (n = 4) and ascending TEVAR
(n = 1). Concomitant procedures included: Aortic valve repair (n = 4), replacement
(n = 2), root remodeling (n = 1) and coronary bypass (n = 1).

RESULTS: There was no peri-operative mortality. One patient underwent reoperation
for bleeding and 2 required tracheostomies for respiratory failure, but there was no
renal failure, stroke or spinal injury. At a median follow up of 56 months, there were
four aortic reoperations: 1 distal stentgraft extension for type 1b endoleak, 2 hybrid
thoracoabdominal completion repairs for growth of residual distal disease, and 1
emergency TEVAR for aorto-bronchial fistula. The latter patient died from septic
complications and there were 3 other late non-cardiac deaths.
CONCLUSION: Retrograde ascending dissection can present as an early or late complication after descending stent grafting due to aortic wall instability or disease progression, and is usually associated with a history of dissection or intramural hematoma. It is a life-threatening complication that can be managed safely with early recognition and rapid delivery of open or hybrid repair.
OBJECTIVES: Despite the demonstration of superior outcome of TAVI vs optimal medical therapy in patients with severe left ventricular systolic dysfunction (SLVSD), literature lacks studies comparing hospital outcome after TAVI or surgical aortic valve replacement (AVR) in this high-risk group.

METHODS: After propensity-matching for age, sex, baseline comorbidities, previous interventions, priority at hospital admission, frailty score, NYHA-class, EuroSCORE, and associated cardiac diseases, 30-day mortality and procedure-related morbidity of 162 patients (81 TAVI vs 81 AVR) with severe LVSD (ejection fraction ≤35%) – out of 5890 patients enrolled in this prospective multicenter national registry – were analyzed at a core unit of the National Institute of Health.

RESULTS: Thirty-day mortality was comparable (6.2% TAVI vs 8.6% AVR, p = .37), as well as peri-procedural acute myocardial infarction (1.2% TAVI vs 0% AVR, p = .55), low output state (6.4% TAVI vs 11.4% AVR, p = .27), stroke (1.2% TAVI vs 4.9% AVR, p = .36), major vascular complications (1.2% TAVI vs 0% AVR, p = .55), and renal dysfunction (peak creatinine level: 1.7 ± 1.4 mg/dL in TAVI vs 1.8 ± 1.4 in AVR, p = .57).
Patients undergoing TAVI showed significantly higher need for post-procedural permanent pace-maker implantation (13.6% TAVI vs 1.2% AVR, p = .01), whereas those undergoing AVR showed a higher need for peri-procedural transfusions (24.4% TAVI vs 76.5% AVR, p < .001) in spite of a similar transfusion rate per patient (2.8 ± 3.7 TAVI vs 4.4 ± 3.8 AVR, p = .08).

Post-procedural Intensive Care Unit length of stay (median 2 days after TAVI vs. median 3 days after AVR, p = .34), intermediate-care length of stay (1.88 ± 3.2 days vs AVR: 1.0 ± 3.7, p = .11) and whole hospitalization (median 11 days after TAVI vs median 14 days after AVR, p = .51) were comparable.

**CONCLUSIONS:** TAVI in patients with SLVSD is a valid alternative to AVR in terms of hospital mortality and peri-procedural morbidity. Comparison in mid-to-long term outcome are mandatory.
OBJECTIVES: To analyze distal segmental aortic growth and distal aortic reoperation rates following 1-stage open repair of extensive chronic aortic dissection which included resection and graft replacement of the proximal aneurysmal descending thoracic aorta (DTA). The graft was attached to a site on the DTA where it measured 3 to 3.5 cm in diameter. Flow was established to both the true and false lumens.

METHODS: Among 68 patients undergoing extensive 1-stage repair of chronic aortic dissection which included the ascending aorta, arch and varying lengths of the DTA, 66 were hospital survivors (early mortality 2.9%), and 51 of these patients (77%) had serial computed tomographic scans suitable for calculation of growth rates of the remaining DTA and upper abdominal aorta. The mean duration of follow-up was 5.86 years and extended to 13.7 years.

RESULTS: For 28 patients followed for more than 5 years, zero or negative growth at these levels was observed in 50% (14 patients). The mean growth rate for the remaining 14 patients was 0.86 mm/yr. Three patients required reoperation on the contiguous DTA or abdominal aorta for aneurysmal degeneration at 8 months, 34 months, and 6.2 years after the 1-stage procedure. Actuarial freedom from reoperation for aneurysmal growth of the contiguous distal aorta at 5 and 10 years was 96.2 ± 2.7% and 96.2 ± 2.7%, respectively. No patient died following reoperation. Four additional patients required aortic reoperation for indications un-related to aneurysmal growth. Actuarial freedom from any aortic reoperation at 5 and 10 years was 90.6 ± 4.0% and 90.6 ± 4.0%, respectively. Actuarial survival at 5, 7, and 10 years was 77.7 ± 5.5%, 70.7 ± 6.4%, 56.1 ± 7.7%, respectively. No patient whose cause of death was known died of aortic rupture.

CONCLUSIONS: Open repair for extensive chronic aortic dissection in the current study led to extremely low rates of growth and reoperation on the remaining dissected distal aorta. Graft replacement of the proximal DTA permits antegrade flow to both the true and false lumens distal to the repair, and appears to favorably stabilize the distal aorta. Although no direct comparison was performed, the observed growth, aneurysm formation, and reintervention rates are substantially lower than those reported following endovascular repair of the DTA, either as part of a hybrid procedure for extensive thoracic aortic dissection, or for treatment of isolated chronic dissection of the DTA.
OBJECTIVES: There has been considerable discussion whether robotic assisted thoracic surgery (RATS) lobectomy affords any benefits when compared to video assisted thoracic surgery (VATS) lobectomy given the presumed increase in material costs of robotic surgery. Thus, we chose to compare outcomes of patients undergoing RATS and VATS lobectomy for lung cancer.

METHODS: This is a retrospective review of all patients undergoing lobectomy by RATS or VATS for lung cancer between 2011 and 2012. All procedures were performed by a single surgeon. RATS lobectomy employed a complete portal 4 arm approach with the da Vinci S system while VATS utilized a single camera port and a 4 cm access incision.

RESULTS: Over a 18 month period a total of 52 patients underwent pulmonary resection (20 RATS, 32 VATS). Patient groups were similar for age and clinical stage. There were no conversions to thoracotomy in either group. When comparing RATS vs. VATS, median operating time was 153 minutes vs. 130 minutes (p = 0.02), median length of stay was 3.0 days in both groups, and median number of lymph nodes harvested was 17.5 vs. 15.5 (p = 0.28). Morbidity and mortality for RATS vs. VATS were 10% vs. 15.6% (p = 0.69) and 0% vs. 3% (p = 0.99), respectively. 2/20 RATS lobectomy patients received induction chemoradiotherapy compared to none in the VATS group. Median hospital billing costs were $48,116 vs. $48,015 (p = 0.84).

CONCLUSIONS: There does not appear to be a significant difference in clinical outcomes when comparing RATS lobectomy and VATS lobectomy. Median procedural times by RATS were increased by about 20 minutes. This may reinforce the notion that robotics may serve as a reasonable alternative platform for minimally invasive thoracic surgery.
**OBJECTIVES:** To determine the prognostic significance of extralobar nodal metastases versus intralobar nodal metastases in lung cancer patients with pathologic N1 disease.

**METHODS:** A retrospective review of a prospectively-maintained lung resection database identified 230 patients with pathologic stage II N1 non-small cell lung cancers from 1997–2011. Surgical pathology reports were reviewed to identify the involved N1 stations. Outcome variables included recurrence and death. Univariate and multivariable analyses were performed using the R statistical software package.

**RESULTS:** Of the 230 stage II (N1) patients, 122 patients had extralobar nodal metastases (levels 10 or 11), while 108 patients had intralobar nodal disease (levels 12–14). Baseline characteristics were similar in both groups. No significant differences were noted in type of resection between the groups (73% lobectomy, 18% pneumonectomy, 6% bilobectomy, 3% segmentectomy for the entire cohort). Median follow-up was 111 months. Overall, 83 patients recurred during follow-up: 34/108 (31%) in the intralobar cohort and 49/122 (40%) in the extralobar cohort. Median overall survival was 46.9 months for the intralobar cohort and 24.4 months for the extralobar cohort (Figure, p < .001). In multivariable Cox proportional hazard models including age, grade, tumor size, pulmonary function, and presence of extralobar N1 disease, extralobar nodal disease independently predicts both recurrence-free and overall survival (hazard ratio 1.95 [1.36, 2.81]).
CONCLUSIONS: The presence of extralobar nodal metastases at levels 10 or 11 predicted significantly poorer outcomes than did nodal metastases at stations 12–14. This finding has prognostic importance as well as implications for adjuvant therapy and surveillance strategies for patients within the heterogeneous stage II (N1) category.
CF11. The Role of Epidermal Growth Factor Receptor Tyrosine Kinase Inhibitor In Recurrent Pulmonary Adenocarcinoma After Curative Surgical Resection

Jae Hyun Jeon, Chang Hyun Kang, Young Tae Kim, In Kyu Park, Hye-seon Kim

Seoul National University Hospital, Seoul, Korea, Republic of

OBJECTIVES: It has been known that epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor (TKI) prolongs survival of the patients with metastatic non-small cell lung cancer harboring EGFR mutation. This study aimed to identify whether treatment of TKI can improve survival of the patients with recurrent pulmonary adenocarcinoma after curative resection.

METHODS: Prospective evaluation of EGFR mutation was performed in the patients who underwent curative surgical resection due to non-small cell lung cancer. EGFR mutation status was evaluated in 594 patients with adenocarcinoma. Among them, recurrence occurred in 146 patients and these patients were enrolled in the study. Various factors affecting post-recurrence survival (PRS) were evaluated by univariate analysis, and potential prognostic factors for PRS including age at initial recurrence, gender, performance status, smoking status, pathologic stage, adjuvant treatment, disease-free interval, location of initial recurrence, treatment modality for recurrence, EGFR mutation status, and treatment of EGFR TKI were evaluated by multivariable Cox proportional hazard model.

RESULTS: Among 146 patients with recurrent lung cancer, there were 75 men (51.4%) and 71 women (48.6%). Median age at time of recurrence was 64.2 years and median time from surgical resection to recurrence was 18.4 months. Locations of recurrence were intrathoracic in 91 patients (62.3%), extrathoracic in 33 (22.6%), and combined in 22 (15.1%). One hundred thirty three patients (91.1%) underwent any form of treatment after recurrence. Treatments after recurrence included chemotherapy alone in 68 (46.6%) patients, surgical resection in 44 (30.1%), concurrent chemoradiation in 14 (9.6%) and radiation alone in 7 (4.8%). EGFR mutations were identified in 79 patients (54.1%), and 61 (77.2%) patients of them were treated with EGFR TKI. In multivariate analysis, older age, poor performance status at recurrence, treatment of adjuvant radiotherapy, decreased disease-free interval from initial resection to recurrence, extrathoracic multiple organ metastasis, non-surgical treatment for initial recurrence, and treatment modality without EGFR TKI were significant poor prognostic factors for PRS (p < 0.05). The treatment of EGFR TKI in patients with EGFR mutation was statistically significant favorable prognostic factor for PRS (p = 0.007). The 5-year PRS was 61.8% in patient with EGFR mutation treated with EGFR TKI and 31.0% in other patients.
## Predictors of Postrecurrence Survival: Multivariable Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cox Proportional Hazard</th>
<th>p-Value</th>
<th>Variable</th>
<th>Cox Proportional Hazard</th>
<th>p-Value</th>
<th>Variable</th>
<th>Cox Proportional Hazard</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age at recurrence (years)</strong></td>
<td></td>
<td></td>
<td>Pathologic Stage</td>
<td></td>
<td></td>
<td>Treatment for initial recurrence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;60</td>
<td>1.0 (reference)</td>
<td></td>
<td>Adjuvant radiotherapy</td>
<td>3.82 (1.81, 8.06)</td>
<td>0.001</td>
<td>Surgery Based</td>
<td>1.0 (reference)</td>
<td></td>
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<tr>
<td>60–70</td>
<td>2.86 (1.36, 6.01)</td>
<td>0.006</td>
<td>Disease free interval &lt;1 years</td>
<td>0.28 (0.14, 0.58)</td>
<td>0.001</td>
<td>Radiation only</td>
<td>4.92 (1.28, 18.8)</td>
<td>0.02</td>
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<tr>
<td>70–80</td>
<td>1.1 (0.46, 2.77)</td>
<td>0.827</td>
<td>Initial recurrence site</td>
<td>1.0 (reference)</td>
<td>0.157</td>
<td>Chemotherapy only</td>
<td>2.48 (0.98, 6.23)</td>
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<tr>
<td>≥80</td>
<td>0.4 (0.05, 3.41)</td>
<td>0.404</td>
<td>Lung only</td>
<td>1.0 (reference)</td>
<td>0.217</td>
<td>Chemotherapy and radiation</td>
<td>4.14 (1.26, 13.7)</td>
<td>0.019</td>
</tr>
<tr>
<td>Gender</td>
<td>0.806</td>
<td></td>
<td>All Other chest (not lung only)</td>
<td>1.72 (0.73, 4.06)</td>
<td>0.217</td>
<td>No treatment</td>
<td>6.35 (1.13, 35.8)</td>
<td>0.036</td>
</tr>
<tr>
<td><strong>ECOG performance status ≥1 at recurrence</strong></td>
<td>2.04 (1.03, 4.03)</td>
<td>0.041</td>
<td>Extrathoracic (single organ)</td>
<td>1.63 (0.67, 3.96)</td>
<td>0.285</td>
<td>EGFR-TKI treatment</td>
<td>0.34 (0.16, 0.75)</td>
<td>0.007</td>
</tr>
<tr>
<td>Smoking (never)</td>
<td>0.275</td>
<td></td>
<td>Extrahoracic (multiple organ)</td>
<td>2.41 (1.13, 5.17)</td>
<td>0.024</td>
<td>EGFR mutation</td>
<td>0.76 (0.37, 1.56)</td>
<td>0.461</td>
</tr>
</tbody>
</table>
CONCLUSIONS: In this study, EGFR TKI treatment for recurrent pulmonary adenocarcinoma significantly prolonged post-recurrent survival. Evaluation of EGFR mutation status may be mandatory in the patients with recurrent pulmonary adenocarcinoma after surgical resection.
OBJECTIVES: Failure of anastomotic healing is a rare but serious complication of short segment laryngotracheal resection and reconstruction. Treatment options include re-operation, tracheostomy, or T-tube placement. Hyperbaric oxygen therapy (HBOT) is the delivery of 100% O2 at pressures greater than 1 ATM, and has been shown in animal models to enhance wound healing after tracheal resection. To date, there have been no reports describing its utility in humans following tracheal resection.

METHODS: Five consecutive patients with anastomotic problems identified by bronchoscopy were treated. Patients treated by HBOT were noted to have varying degrees of failure to heal, from necrotic cartilage to partial separation, exposed cartilage or visible sutures on bronchoscopy. All previously would have had a tracheostomy. HBOT was administered for 90 minutes via a hyperbaric chamber pressurized to 2 atm with 100% oxygen. Patients were treated with daily or twice daily HBOT. Four of five patients had buttressing of the anastomosis by strap muscle at the initial surgery.

RESULTS: All patients had evidence of anastomotic healing on bronchoscopy. None of the patients in this series required reoperation after initiation of HBOT. On average it took 9.6 days for healing to occur (5–14 days) and the mean number of HBOT sessions was 13.8 (5–24). The average size of the anastomotic defect was 8.8 mm (3–13 mm). One patient noted to have anastomotic separation underwent a revision of the anastomosis and tracheostomy placement with HBOT initiated postoperatively and was later successfully decannulated. There were no deaths. One patient required bilateral tympanostomy tubes for hemotypanum. Two patients developed granulation tissue that required debridement. One patient developed tracheal stenosis that required a single dilation procedure.

CONCLUSIONS: In select patients with anastomotic disruptions following tracheal resection and reconstruction, HBOT is well tolerated, promotes rapid healing, and may avoid need for tracheostomy. Future investigations with larger numbers of patients are necessary to delineate the benefit of HBOT in the management of airway anastomotic complications following resection.
OBJECTIVES: The objective is to determine long-term effects and temporal trends on quality of life and degree of compensatory hyperhidrosis (CH) in patients who have undergone VATS sympathotomy for focal hyperhidrosis.

METHODS: A quality of life survey was administered yearly to all patients who underwent VATS sympathotomy for hyperhidrosis.

RESULTS: From 1/1999 until 12/2012, 193 patients underwent VATS sympathotomy. The sympathetic nerve was divided with cautery in all. Majority of patients (93%) complained of CH within 5-years of surgery. Sixty-two percent complained of bothersome CH six years or more after surgery. The degree of CH was not significantly associated with the location(s) of hyperhidrosis the patients had at presentation, age at presentation, body mass index or the temperature change when the nerve was cut, however it was significantly associated with the level of interruption. CH was significantly greater in patients who had a R2 or R3 interruption compared to those that had R4 or R5 interruption (p < 0.001).

CONCLUSIONS: Patients who undergo VATS sympathotomy for hyperhidrosis commonly have compensatory hyperhidrosis and this is more likely to be bothersome if the sympathetic chain is interrupted at R2 or R3 than at lower levels. Interestingly, the severity of CH decreases over time without treatment.

* WTSA Member
CF14. Alimentary Function and Quality of Life 10 or More Years After Esophagectomy with Gastric Pull-Up


Keck School of Medicine of the University of Southern California, Los Angeles, CA

OBJECTIVE: The stomach is the preferred conduit for esophageal replacement after esophagectomy but knowledge about long-term alimentary function after a gastric pull-up is limited. The aim of this study was to assess the function of a gastric interposition and quality of life 10 years after esophagectomy.

METHODS: A retrospective chart review was performed to identify patients that underwent gastric interposition prior to 2003. Living patients were identified using the social security death index website, and an exhaustive search was carried out to locate current contact information. Patients were interviewed regarding alimentary function and reflux symptoms, and were asked to complete both Gastrointestinal Quality of Life (GIQL) and RAND SF-36 questionnaires.

RESULTS: There were 398 patients, of whom 67 were confirmed to be alive and 40 were located and agreed to participate. There were 36 males and 4 females with a median age of 61 years at the time of esophagectomy. The indication for esophagectomy was cancer in 39 and benign disease in 1 patient. A transthoracic en-bloc dissection was performed in 24 and a transhiatal dissection in 16 patients. In all patients the graft was positioned in the posterior mediastinum, a cervical esophagogastrotomy constructed and a pyloroplasty performed.

The median follow-up was 12 years (10–19 yrs). The majority of patients (88%) had no dysphagia, 90% were able to eat three or more meals a day, and 93% finished at least 50% of a typical meal. The median rating of alimentary comfort was 9 on a 10 point scale. One-third of patients experienced palpitations and/or sweating associated with meals. Diarrhea greater than three times a day was reported by 12 patients (30%). Three patients (8%) experienced heartburn despite acid suppression therapy. Regurgitation occurred in 30% of patients, chronic cough in 10% and breathing difficulty in 25%. Aspiration requiring hospitalization occurred in six patients (15%) with all having three or more hospitalizations in the last year. Median weight loss after surgery was 26 lbs, and the current median BMI was 25. All but two patients weighed less than their pre-operative weight, but only two patients were underweight (BMI < 18.5). The median GIQL Score was 2.9 out of 4. Quality of life scores were

* WTSA Member
below normal in one category (Physical Function) and above normal in the remaining seven (Role Limitation due to Physical Health, Role limitation due to Emotional Health, Energy/Fatigue, Emotional well-being, Social Functioning, Pain and General Health).

**CONCLUSION:** Long-term satisfaction with eating and nutritional status following gastric interposition was excellent with 95% of patients having a normal BMI. However, gastrointestinal side-effects were common, particularly dumping, diarrhea and regurgitation. Aspiration was uncommon but in some patients led to repetitive hospital admissions. Despite these issues, overall quality of life was similar to the general population.
CF15. Central Tumor Location for Clinical Stage I Non-Small Cell Lung Cancer (NSCLC): An Underappreciated Negative Prognostic Feature

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1Department of Cardiothoracic Surgery; University of Pittsburgh Medical Center, Pittsburgh, PA; 2Department of Medicine; Division of Pulmonary Medicine; University of Pittsburgh Medical Center, Pittsburgh, PA; 3Pharmacology and Chemical Biology; University of Pittsburgh Medical Center, Pittsburgh, PA

OBJECTIVES: Tumor size, nodal status and other histologic parameters of invasiveness (e.g. visceral pleural invasion) have been established as adverse prognostic factors for localized NSCLC. The prognostic significance of tumor location for clinically limited NSCLC has not been explored. In this study, we sought to determine the impact of tumor location (central vs. peripheral) on the oncologic outcomes following resection for clinical stage I NSCLC.

METHODS: We reviewed all patients undergoing lobectomy for clinical stage I NSCLC at our institution from 8/2001–9/2010 (n = 619). Preoperative evaluation included a negative hilar and mediastinal PET-CT and mediastinoscopy. Tumor location was defined as inner half or outer half of the lung parenchyma based upon CT imaging. The impact of tumor location on recurrence and survival was analyzed using the Kaplan-Maier method and log-rank testing. The specific impact of tumor location on oncologic outcome was assessed utilizing Cox regression analysis including other variables shown to be associated with recurrence risk (tumor size, node positivity, and angiolymphatic invasion). Accuracy of pre-operative staging and patterns of occult nodal metastasis were reviewed.

RESULTS: There were 183 stage I patients with central tumors (112 IA; 71 IB) and 436 with tumors in a peripheral location (311 IA; 125 IB). Overall, 89 (14.4%) patients had a clinical-pathological stage-shift, with the highest proportion of these associated with central clinical IB tumors (31.4%) [Table]. Central tumor location significantly increased overall recurrence in patients with clinical IB disease (5 yr freedom from recurrence = 56% central vs. 74% peripheral; p = 0.010) [Figure], including a 3 fold increase in locoregional recurrence (11% vs. 4%, p = 0.034). However, an important minority of clinical stage IA patients also underwent clinical-pathological up-staging (12.5% central IA; 10% peripheral IA). On multivariate analysis, central tumor location was found to be an independent risk factor for disease recurrence [HR 1.83 (1.04–3.25); p = 0.041]. Tumor location did not have a significant impact on overall survival (p = 0.706).
Rates of Pathological Upstaging of Central and Peripheral Clinical Stage I NSCLC

<table>
<thead>
<tr>
<th>Tumor Location</th>
<th>Overall Upstaging</th>
<th>Occult N1 Disease</th>
<th>Occult N2 Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1A Central</td>
<td>14 (12.2%)</td>
<td>10 (8.9%)</td>
<td>4 (3.6%)</td>
</tr>
<tr>
<td>Stage 1A Peripheral</td>
<td>31 (10.0%)</td>
<td>15 (4.8%)</td>
<td>16 (5.6%)</td>
</tr>
<tr>
<td>Stage IB Central</td>
<td>22 (31.4%)</td>
<td>20 (28.6%)</td>
<td>2 (2.9%)</td>
</tr>
<tr>
<td>Stage IB Peripheral</td>
<td>26 (20.0%)</td>
<td>18 (14.4%)</td>
<td>4 (3.2%)</td>
</tr>
</tbody>
</table>

CONCLUSIONS: A central anatomic tumor location appears to be an important, “underappreciated” adverse prognostic factor in the setting of clinical stage I NSCLC. This relates to a significant clinical:pathological stage shift associated with the presence of occult nodal metastasis not appreciated by current pre-operative diagnostic modalities, and not observed in equivalent-stage peripheral tumors. This observation underscores the importance of surgery with complete nodal sampling/dissection for central clinical stage I tumors, where upstaging is commonly encountered in this era of adjuvant systemic therapy.
CF16. Methicillin-Resistant Staphylococcus Aureus Colonization and Empyema—Does It Matter?
Jennifer L. Dixon, Harry T. Papaconstantinou, Daniel Jupiter, Philip A. Rascoe, Scott I. Reznik
Scott and White Memorial Hospital, Temple, TX

OBJECTIVES: Empyema is a common reason for surgical consultation in patients with pneumonia. The prevalence of methicillin-resistant Staphylococcus aureus (MRSA) colonization is rising, and is an increasingly important pathogen in pneumonia. Nasal-swab testing is effective for identifying patients with MRSA colonization. The effect of MRSA colonization on empyema is not known. We postulated that MRSA colonized patients would be more likely to have MRSA positive cultures, and sought to determine if MRSA positive empyema had an effect on clinical management and patient outcomes.

METHODS: From 2007 to 2010 all patients admitted to our institution were screened for MRSA colonization by nasal swab. We retrospectively reviewed all patients with a diagnosis of empyema. Data reviewed included patient demographics, MRSA colonization status, comorbidities, culture results, clinical management of empyema, and discharge disposition. The relationship between culture results and colonization status was evaluated using the Fisher’s exact test. Discharge disposition was dichotomized between home and a skilled nursing facility or a long-term care hospital, and compared using bivariate tests and logistic regression.

RESULTS: A total of 147 patients were identified with empyema; 16 (10.8%) were MRSA colonized. MRSA colonized patients had a significantly higher rate of MRSA positive empyema cultures (75% vs 4.6%; p < 0.001) with a 93.2% agreement between the two diagnoses. MRSA colonization and MRSA culture positivity did not affect the type of surgical intervention required (medical thoracoscopy, video-assisted thoracoscopic surgery and thoracotomy). However, of the MRSA positive empyema patients 66.7% were managed with thoracostomy tube alone (p < 0.05). MRSA positive empyema was a significant risk factor for discharge to a skilled nursing facility or long-term care hospital (OR 18.6 [95% CI 2.36–147]).

CONCLUSIONS: MRSA colonized patients hospitalized with empyema are highly likely to have MRSA culture positive empyema. MRSA empyema patients are less likely to be discharged home. Our data suggests that neither MRSA colonization nor MRSA positive empyema is associated with an increased requirement for aggressive surgical intervention. MRSA colonized patients should be empirically started on antibiotics that cover MRSA, while non-MRSA colonized patients may not require the same spectrum of coverage while awaiting definitive culture results.
**OBJECTIVES:** No specific conduit is currently recognized as consensus for the right ventricle to pulmonary artery conduit for congenital heart disease. The objective of this study is to assess the long-term outcomes of the right ventricle to pulmonary artery conduit for biventricular repair.

**METHODS:** This is a retrospective review of all right ventricle to pulmonary artery conduit operation as part of biventricular repair for congenital heart disease between 1982 and 2012 at a single institution. Major outcomes studied included patient survival and conduit survival.

**RESULTS:** Four hundred thirty-eight right ventricle to pulmonary artery conduits were implanted as part of biventricular repair during the study period. The mean age at operation was 8.7 ± 9.0 years. There were 17 early deaths (3.9%), 10 late deaths, and 2 orthotopic heart transplants with mean follow-up of 7.5 ± 6.6 years. The actuarial survival and freedom from reoperation for right ventricular outflow tract were 92.3% and 48.0% at 10 years. The operations were divided into subgroups based on the conduit material (group 1: pulmonary homograft: n = 163, group 2: Metronic Hancock® bioprosthetic valved conduits: n = 104, group 3: expanded polytetrafluoroethylene (ePTFE) non-valved conduit: n = 37, 4: hand-made valved ePTFE conduit: n = 74, 5: others: n = 60). The hand-made valved ePTFE conduit was introduced with bicuspid fashion in 2008 and modified to tricuspid fashion with bulging sinuses in 2011. There was no significant difference in the freedom from reoperation for right ventricular outflow tract between the conduit materials (36.7% for group 1, 35.0% in group 2, 25.0% in group 3, 53.0% in group 5 at 5 years, p = 0.91) in the small sized conduits (≤13 mm). In the medium sized conduit (14–17 mm), there was a trend of higher freedom from reoperation in group 3 (51.1% for group 1, 66.5% in group 2, 100% in group 3, 60% in group 5 at 5 years, p = 0.60: group1 vs. 3). In the large sized conduit (≥18 mm), there was a significant difference in the freedom from reoperation between the conduit materials (80.2% for group 1, 54.7% in group 2, 57.1% in group 3, 65.2% in group 5 at 10 years, p = 0.003: group 1 vs. 3). It seemed that the non-valved ePTFE conduit had lower freedom from reoperation more than
10 years after operation due to developing pulmonary regurgitation. The hand-made valved ePTFE conduit had high freedom from reoperation in the medium sized and the large sized conduits (100% for medium size and 98% for large size at 4 year).
CONCLUSIONS: There was no significant difference in the freedom from reoperation for right ventricular outflow tract among the conduit materials in the long-term. The hand-made valved ePTFE conduit had promising mid-term outcomes, however, the longer follow-up is necessary.
OBJECTIVES: Surgical treatment of neonatal hypoplastic aortic arch (HAA) ranges from end to end anastomosis to complex arch reconstruction. This variability is based on exact morphology of the arch and presence of concomitant anomalies. Whenever possible, the end to end technique is preferred since it is performed through left thoracotomy on beating heart compared to complex repair incorporating patch material using cardiopulmonary bypass and often deep hypothermic circulatory arrest. We aimed to evaluate the utility of cross sectional imaging (CSI) in determination of our approach to repair of HAA. Based on the experience gained from these cases we propose an algorithm for surgical treatment of HAA.

METHODS: All patients with an echocardiographic diagnosis of HAA from May 2008 to September 2012 were included. Criteria for HAA included one or more of the following: arch diameter less than 50% of descending aorta, z-score < –2 or arch diameter < weight in kg +1. Patients with hypoplastic left heart syndrome were excluded. Additional CSI was undertaken when either segment 2 of the arch (left carotid artery to left subclavian artery) met criteria for HAA or if the branching pattern of the arch was unclear on echocardiography.

RESULTS: Twenty six patients were enrolled in the study. The median age was 11 days and weight 3.3 ± 0.6 kg. The mean transverse aortic arch Z score was –2.4 by echo. CSI was performed in 13 patients (50%).

Sixteen patients had discrete hypoplasia of the third segment and underwent repair by resection of the isthmus and extended end to end anastomosis via thoracotomy. Four patients had complex arch repair and closure of septal defects using cardiopulmonary bypass through midsternotomy. In 6 patients a complex anatomy of arch was seen with hypoplasia of segment 2 and 3. The CSI images were used to determine the diameter and the length of each segment. In all these patients the diameter of the first segment was similar to descending aorta diameter 4.9 ± 1.1 mm vs. 5.0 ± 0.9 mm, p = 0.9 and the length was similar to the diameter. In these patients an extended end to end anastomosis repair via thoracotomy was performed rather than arch reconstruction on cardiopulmonary bypass as it was be initially planned based on echocardiogram. The cross sectional imaging of the aorta especially with the 3-D reconstruction delineated the exact anatomy of each segment and it provided a realistic view for visualization of the repair.
There was no peri-operative mortality and no patient needed reintervention in follow-up.

CONCLUSIONS: We recommend a low threshold for obtaining a cross sectional imaging in patients with HAA. Our results suggest that in normal size of ascending aorta, if segment 1 of the neonatal aortic arch has both a length and a diameter similar to diameter of descending aorta, an extended end to end anastomosis via left thoracotomy is appropriate even in patients with complex arch anatomy.
OBJECTIVES: No study has previously assessed variation of care after Blalock-Taussig (BT) shunt surgery among US pediatric centers. We evaluated the trend of complications and mortality and their association in particular with anticoagulation regimens after BT surgeries across the centers participating in Pediatric Health information system (PHIS) database.

METHODS: We retrospectively reviewed data from neonates who underwent BT shunt procedure at 39 centers in the United States (2004 to 2011). We limited our study to those who had no other accompanying procedure except PDA ligation at time of surgery. Since anticoagulation regimen was a key variable for the study, we excluded subjects with diagnosis of deep vein thrombosis or need for ECMO prior to surgery. Anticoagulant regimens were categorized as: heparin only, aspirin only, heparin plus aspirin, and no drug. Overall variation in rates of discharge mortality and BT related complications were depicted in funnel plots. Complications were defined as, revision/repeat of BT shunt procedure during same admission, institution of ECMO following surgery, and catheter interventions after BT shunt surgery. For funnel plotting, unadjusted mortality and complication rates were plotted against the number of subjects in each center with lines depicting 95% binomial prediction. The trends for overall complications and discharged mortality rates within the study period were also reported. A comparison between the proportions of patients in each anticoagulation category was performed between total numbers of patients from hospitals with best versus those with worst outcomes. The time of initiation of aspirin was also investigated separately.

RESULTS: A total of 2536 patients were identified. Co-administration of aspirin and heparin was the most common anticoagulation regimen for 79.5% centers (31/39). Postoperative management with no anticoagulant, however, was not an uncommon approach and was seen in 10.3% (4/39) of centers. Funnel plots, highlighting the outcomes from various centers, allowed discrimination of discharge mortality and cumulative complication rate around an average of 7.5% and 18.7%, respectively (graph 1 and 2). Comparison of the proportion of patients in anticoagulation categories between the hospital groups with best and worst complication rates revealed a considerable difference in the rate of administration of aspirin as part of anticoagulant regimen in the two groups (95.6% vs. 33%, p value < 0.001). Furthermore, centers with worst outcomes had a significant higher rate for not using any anticoagulation after surgery (13.6% vs. 2.6%, p value < 0.001). Centers with the best
outcomes started aspirin sooner, with median start day of 2 versus 4 in comparison with centers with worst outcomes (p value < 0.001, patients were matched for weight, gestational age and cardiac diagnosis between the two groups).

CONCLUSIONS: Centers with best outcomes implement aspirin as part of their post-operative anticoagulation regimen. Further, the earlier initiation of aspirin therapy results in better outcomes.
BACKGROUND: Historic outcomes of patients with heterotaxy and pulmonary atresia or stenosis (PA/PS) have been poor and in the current era are incompletely described. We reviewed our management of these patients and associated risk factors for mortality.

METHODS: We performed a retrospective chart review of all patients with heterotaxy and PA/PS, treated in our institution between January 1, 2002 to August 31, 2012. Mortality data was also confirmed with the Social Security Database. Log rank analysis was done to assess the following as risk factors for mortality – discontinuous PA s, TAPVR, obstructed TAPVR requiring surgery at less than 30 days, obstructed TAPVR requiring surgery at greater than 30 days, pulmonary stenosis vs pulmonary atresia.

RESULTS: We identified 42 patients with heterotaxy and PA/PS. Patient demographics and diagnoses are listed in Table 1. Median age at first surgery was 6.5 days and median followup is 3.5 years. Mortality data was complete for all patients.

Table 1: Heterotaxy with Pulmonary Atresia/Stenosis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number (n)</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Male</td>
<td>19</td>
<td>45.24%</td>
</tr>
<tr>
<td>Female</td>
<td>23</td>
<td>54.76%</td>
</tr>
<tr>
<td>Pulmonary atresia</td>
<td>25</td>
<td>59.5%</td>
</tr>
<tr>
<td>Pulmonary stenosis</td>
<td>17</td>
<td>40.5%</td>
</tr>
<tr>
<td>Unilateral/Bilateral Discontinuous pulmonary arteries (PA s)</td>
<td>7</td>
<td>16.67%</td>
</tr>
<tr>
<td>Total Anomalous Pulmonary Venous Return (TAPVR)</td>
<td>13</td>
<td>31%</td>
</tr>
</tbody>
</table>
Clinical management is summarized in Figure 1.

Thirteen patients with heterotaxy, pulmonary atresia/stenosis had associated TAPVR (Figure 2). Overall mortality was 19% (8 of 42). The 30 day, 1 year and 5 year mortality estimation based on Kaplan-Meier method was 4.76%, 12.3% and 19.1% respectively (Figure 3). Log rank analysis showed TAPVR ($p = 0.038$) and obstructed TAPVR requiring surgery at less than 30 days ($p = 0.001$) to be significant risk factors for mortality. The management of unilateral or bilateral discontinuous PA's is evolving in our institution. In the completely discontinuous PA's we have used techniques of unifocalization with homograft, autologous pericardial or vascular tissue and most recently ductal stenting. We had 5 patients with bilateral discontinuous PA's of which 2 had single stage restoration of PA continuity though we prefer to stage centralization of PA’s when feasible. When associated with TAPVR we prefer ductal stenting for neonatal management of discontinuous PA’s.
CONCLUSION: In the current era surgical treatment of heterotaxy and pulmonary atresia or stenosis can result in good outcomes. Associated TAPVR and obstructed TAPVR requiring neonatal correction were noted to be risk factors for mortality.
CF21. Outcomes of Tricuspid Valve Repair in Children with Hypoplastic Left Heart Syndrome: Is the Presence of Tricuspid Valve Regurgitation a Risk Factor for Survival?
Mark Ruzmetov, Dale M. Geiss, *Randall S. Fortuna
Children’s Hospital of Illinois, Peoria, IL

OBJECTIVES: Tricuspid valve regurgitation (TR) is a common finding in children with hypoplastic left heart syndrome (HLHS) undergoing staged surgical reconstruction and can result from either abnormal valve morphology or incomplete leaflet coaptation due to annular dilatation. The purpose of this study was to determine the incidence of moderate/severe TR and to examine and evaluate the efficacy of surgical results of tricuspid valve repair/replacement.

METHODS: Between December 1988 and September 2012, 86 patients with HLHS underwent a Norwood procedure (mean age/weight, 12.1 days/3.5 kg). Thirty-five percent had associated congenital cardiac, structural, and genetic anomalies. Subsequently, 61 patients underwent a bidirectional Glenn procedure (stage II) and 37 patients a modified Fontan procedure (stage III). The mean follow-up was 6.2 years. All patients were evaluated preoperatively and postoperatively by Doppler echocardiography to determine the degree of TR.

RESULTS: Overall early mortality from 1988 to 2008 after the Norwood procedure was 12%. The causes of mortality were sepsis, capillary leak, or low cardiac output. Eight patients died between stages I and II. Two patients underwent heart transplantation because of heart failure. Sixty-two percent of the patients (n = 53) had none/trivial, 26% (n = 22) had mild, 8% had moderate, and 4% had severe TR on their post-Norwood Doppler echocardiograms. Among 76 Norwood survivors, eleven children (15%) with significant TR (moderate/severe) required tricuspid valve repair in a median interval after the Norwood procedure 6 months (range, 2–36). There was no hospital death and 2 late deaths. The overall survival rate between TR and non-TR repair groups was not significant different (p = 0.27).

CONCLUSIONS: The presence of moderate/severe TR necessitates valve repair. The TR in children with HLHS is not risk factor for mortality. Successful tricuspid valve repair at late follow-up predicts excellent late survival.
OBJECTIVES: We sought to evaluate outcomes of systemic to pulmonary artery shunts in patients weighing less than 3 kg.

METHODS: All non-Norwood patients weighing <3 kg who underwent modified Blalock-Taussig (MBTS) or central (CS) shunts with goretex grafts at our institution from January 1, 2000 to May 31, 2011 were reviewed. Patients were categorized according to shunt type (MBTS vs CS) and shunt size (3, 3.5, and 4 mm). Diagnostic categories included PA/IVS, PA/VSD, anomalies with anticipated biventricular repair (BVR), and those with anticipated univentricular palliation (UVR – non-Norwood). Relevant preoperative characteristics were incorporated into logistic regression analysis to evaluate outcomes of discharge survival and late survival, postoperative cardiac arrest and/or ECLS, and shunt re-intervention.

RESULTS: In this cohort of 90 patients, discharge survival was 90% (81/90). Of the 81 survivors, 84% presented for subsequent planned repair or palliation. Hospital survival was higher for diagnostic groups PA/IVS, PA/VSD, and BVR analyzed collectively (94% – 67/71) compared to the UVR group (74% – 14/19) (p = 0.02). Postoperative cardiac arrest occurred in 7% (6/90) and ECLS in 10% (9/90). Cardiac arrest and/or ECLS was more common for CS – 25% (5/20) compared to 9% (6/70) for MBTS (p = 0.05); and for 3 mm shunts – 25% (9/36) compared to 4% (2/51) for 3.5 and 4 mm shunts (p = 0.01). Shunt re-intervention was required in 19% (17/90), and was more common for 3 mm shunts – 44% (16/36) compared to 2% (1/51) for 3.5 or 4 mm shunts (P < 0.0001). On logistic regression, only preoperative organ failure/dysfunction was associated with discharge mortality with an odds ratio (OR) of 7.7 (p = 0.01). Late death before planned repair was associated with CS (OR 9.3, p = 0.02), shunt via thoracotomy (OR 6.9, p = 0.03), and genetic anomaly (OR 4.0, p = 0.04). Postoperative ECLS was associated with CS (OR 5.1, p = 0.03) and preoperative organ failure (OR 6.8, p = 0.02).

CONCLUSIONS: In this high-risk group of small babies <3 kg undergoing systemic to pulmonary artery shunts the survival to definitive repair or next planned palliation was very good. Shunt re-intervention was exceedingly low in 3.5 or 4 mm shunts, but was common in 3 mm shunts. Central shunts and 3 mm shunts may pose higher risk for early morbidity and/or late mortality in patients <3 kg.

* WTSA Member
BACKGROUND: Initial palliation for hypoplastic left heart syndrome (HLHS) may impact on long term results. Neither the Hybrid Procedure (ductal stent and bilateral PA bands) nor the Norwood procedure have been established as the optimum first stage procedure for these patients. We sought to compare the mid-term outcomes of patients with hypoplastic left heart syndrome (HLHS) treated by either a hybrid approach (ductal stent and bilateral PA bands) or conventional Norwood procedure as their initial palliation.

METHODS: We conducted a retrospective review of all patients with HLHS treated at a single center. Outcome measures obtained include survival, length of hospital and ICU stay, time on ventilator and operative data. Between 1/1/2007 and 12/1/2012, 40 patients presented to our center with HLHS; 23 underwent hybrid and 17 Norwood procedures. Both procedures were performed with similar frequency over the course of the study. The patients were followed through their second stage palliation which consisted of a Glenn shunt in the Norwood group and aortic reconstruction, Damus-Kaye-Stansel and Glenn shunt in the Hybrid group. Standard statistical analysis was performed.

RESULTS: The weight at initial palliation was 2.6 ± 0.7 kg in the hybrid and 3.2 ± 0.5 kg in the Norwood group (p = NS). There were a total of 9 deaths in the Hybrid group and 3 in the Norwood group. The 9 deaths in the Hybrid group included 6 early after the hybrid procedure and 2 early after stage II palliation. The 3 deaths in the Norwood group included 1 early after the Norwood and 2 late following the Glenn shunt. Overall survival was 61% in the Hybrid group and 82% in the Norwood group. Length of hospital stay, ICU stay and ventilator days following the initial palliation were shorter after Hybrid compared to Norwood. (Table 1, *p < 0.05) However, for second stage palliation all of these were better in the group initially treated with Norwood Procedure. (Table 2, *p < 0.05) Cardiopulmonary bypass time for the second stage palliation was significantly longer in the hybrid group. Late follow up, SaO2 post Glenn, and need for unplanned reintervention were similar in each cohort.
Table 1: (Initial Palliation)

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Length of Stay (Days)</th>
<th>Days in ICU</th>
<th>Ventilator Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid</td>
<td>23</td>
<td>20 ± 12*</td>
<td>13 ± 12*</td>
<td>12 ± 13*</td>
</tr>
<tr>
<td>Norwood</td>
<td>17</td>
<td>44 ± 37</td>
<td>26 ± 35</td>
<td>21 ± 29</td>
</tr>
</tbody>
</table>

Table 2: (Second Stage Palliation)

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>CPB Time (Minutes)</th>
<th>Length of Hospital Stay</th>
<th>ICU Stay</th>
<th>Ventilator Days</th>
<th>Follow-Up (Days)</th>
<th>Late SaO2</th>
<th>Reintervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid</td>
<td>16</td>
<td>215 ± 35</td>
<td>31 ± 21</td>
<td>17 ± 14</td>
<td>7 ± 5</td>
<td>726 ± 711</td>
<td>82 ± 4</td>
<td>57%</td>
</tr>
<tr>
<td>Norwood</td>
<td>13</td>
<td>89 ± 32*</td>
<td>9 ± 5*</td>
<td>5 ± 2*</td>
<td>2 ± 2*</td>
<td>711 ± 531</td>
<td>80 ± 3</td>
<td>47%</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** While the hybrid procedure as initial palliation for HLHS has some attraction because of the avoidance of cardiopulmonary bypass and circulatory arrest, mid term results do not support employing this as a routine for patients with HLHS. The hospitalization following the Glenn shunt in the Hybrid group is clearly more complex and prolonged. Mid term survival is better in those undergoing Norwood procedure as the initial palliation.
CF24. Bilateral Branch Pulmonary Arterial Banding Has Long-Term Negative Consequences For Pulmonary Arterial Growth

Ryan Robert Davies, Wolfgang A. Radtke, Dore Klenk, Christian Pizarro
Nemours/A.I. duPont Hospital for Children, Wilmington, DE

BACKGROUND: Branch pulmonary artery banding (bPAB) in combination with ductal stenting or prostaglandin therapy has become increasingly common as initial palliation for ductal dependent systemic circulation. The long-term impact of bPAB on PA growth remains a matter of concern, and has not been thoroughly investigated.

METHODS: We conducted a retrospective review of all patients with ductal dependent systemic circulation (2001–2012) undergoing bPAB placement at a single institution (PAB, n = 46); patients stage I Norwood procedures (St1N, n = 48) were used for comparison (Table 1, 2). Pulmonary arterial growth and the need for PA interventions (surgical arterioplasty, balloon angioplasty, stent implantation) over time were assessed.

RESULTS: Median bPAB diameter was 2.5 (range 2.0–3.5). Left and right PAs were banded to the same diameter in 34 (73.9%) patients; 7 required band adjustment. Bands were in place for a median of 79.5 days (1–229). Following band removal, freedom from any PA interventions was poor in the PAB group compared to the St1N group (Figure). There was a trend toward operative PA intervention among 2-ventricle patients (p = 0.06), otherwise operative staging (stage 1 alone vs. combined stage 1 and 2) did not impact PA interventions. bPAB patients frequently required multiple PA interventions (9/46 vs. 2/48, p = 0.02). There was a trend toward increased likelihood of lobar branch obliteration in the PAB group (OR 2.8, 95% CI 0.5–15.2). Duration of bPAB, symmetric banding, and the need for bPAB adjustment did not affect the likelihood of subsequent intervention.

Mean PA diameter at pre-2nd stage cath was smaller in the PAB group (RPA: 4.0 vs. 5.2 mm, p = 0.03; LPA 3.7 vs. 4.1, p = NS), at pre-Fontan cath they were similar between groups. PA growth was not different between groups. Attainment of both stage 2 and Fontan palliation was similar across groups. Overall mortality was higher in the PAB group (p = <.01).
<table>
<thead>
<tr>
<th></th>
<th>bPAB (n = 46)</th>
<th>St1N (n = 48)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (male)</td>
<td>60.5%</td>
<td>53.2%</td>
<td>NS</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>2.5 ± 0.7</td>
<td>3.3 ± 0.5</td>
<td>0.04</td>
</tr>
<tr>
<td>Premature Birth</td>
<td>31.1%</td>
<td>8.7%</td>
<td>0.008</td>
</tr>
<tr>
<td>Birth weight (kg)</td>
<td>2.5 ± 0.7</td>
<td>3.2 ± 0.4</td>
<td>0.005</td>
</tr>
<tr>
<td>Gestational Age (wks)</td>
<td>36.5 ± 2.9</td>
<td>38.4 ± 1.5</td>
<td>0.003</td>
</tr>
<tr>
<td>Genetic Syndrome</td>
<td>10.9%</td>
<td>2.1%</td>
<td>NS</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>2.4%</td>
<td>0.0%</td>
<td>NS</td>
</tr>
<tr>
<td>Shock</td>
<td>28.6%</td>
<td>6.4%</td>
<td>.005</td>
</tr>
<tr>
<td>Operative Procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branch PAB</td>
<td>100%</td>
<td>0.0%</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Stage I Norwood</td>
<td>26.1%</td>
<td>100.0%</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Combined St I/St 2</td>
<td>69.6%</td>
<td>0.0%</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Stage 2 Palliation</td>
<td>43.5%</td>
<td>72.9%</td>
<td>.003</td>
</tr>
<tr>
<td>Fontan</td>
<td>21.7%</td>
<td>45.8%</td>
<td>.01</td>
</tr>
<tr>
<td>Two-ventricle repair</td>
<td>21.7%</td>
<td>8.3%</td>
<td>.07</td>
</tr>
<tr>
<td>Orthotopic Heart Transplant</td>
<td>4.4%</td>
<td>2.1%</td>
<td>NS</td>
</tr>
</tbody>
</table>

**Freedom from Patch Pulmonary Arterioplasty**

- **bPAB Group**
- **St1N Norwood Group**

*Freedom from patch pulmonary arterioplasty p<0.007*
CONCLUSIONS: Branch pulmonary artery banding results in long-term need for pulmonary arterial interventions independent of PAB duration or diameter. Despite the additional need for reintervention, pulmonary arterial growth is usually adequate for eventual Fontan candidacy.

7:00 am – 11:00 am **FAMILY HOSPITALITY, Boardroom 5ABC**
7:00 am – 10:00 am Breakfast Served
10:00 am – 11:00 am Snacks & Beverages Served

NOTES
**16. Safety and Efficacy of Prothrombin Complex Concentrates for the Treatment of Coagulopathy Following Cardiac Surgery**


Oregon Health and Science University, Portland, OR

**DISCUSSANT: DANIEL L. SERNA**

**BACKGROUND:** Coagulopathy associated with cardiopulmonary bypass is an important cause of bleeding following complex cardiac surgery. The conventional treatment for coagulopathy is transfusion, which is associated with adverse outcomes including early and late mortality. We report our initial experience with the prothrombin complex concentrate FEIBA (Factor eight inhibitor bypass activity) for the rescue treatment of coagulopathy and life-threatening bleeding following cardiac surgery.

**METHODS:** All patients with coagulopathy following cardiac surgery at our institution are initially treated with conventional blood component transfusion. Twenty-five patients with coagulopathy and life-threatening bleeding refractory to conventional treatment have received FEIBA as rescue therapy. Their demographic and perioperative clinical data are presented. This patient group represents approximately 2% of patients undergoing cardiac surgery in our university-based practice during the study.

**RESULTS:** Patient demographic and clinical data are presented in Table 1. The patients were at high risk for postoperative coagulopathy with all patients having at least 2 risk factors for this. Aortic root replacement (Bentall or David procedure) and heart transplant with or without LVAD explant were the most common procedures. The mean FEIBA dose administered was 2154 Units. The need for fresh frozen plasma and platelet transfusion decreased substantially after FEIBA administration (p = 0.0001 and p < 0.0001). The mean INR decreased from 1.59 to 1.12 (p < 0.0001). Clinical outcomes were excellent. No patient returned to the operating room.

* WTSA Member
for re-exploration. There was no hospital mortality and all patients were discharged to home. One patient who had a central line and transvenous pacemaker developed an upper extremity deep vein thrombosis.

### Table 1:

<table>
<thead>
<tr>
<th>Patient Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>49.6 years</td>
</tr>
<tr>
<td>Male gender</td>
<td>20 (80%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Factors for Coagulopathy and Bleeding</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative anticoagulation</td>
<td>13 (52%)</td>
</tr>
<tr>
<td>Redo sternotomy</td>
<td>10 (40%)</td>
</tr>
<tr>
<td>Heart transplant</td>
<td>9  (36%)</td>
</tr>
<tr>
<td>Aortic surgery</td>
<td>11 (44%)</td>
</tr>
<tr>
<td>LVAD explant</td>
<td>6  (24%)</td>
</tr>
<tr>
<td>LVAD implant</td>
<td>5  (20%)</td>
</tr>
<tr>
<td>Cardiopulmonary bypass &gt;180 minutes</td>
<td>14 (56%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FEIBA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean FEIBA dose</td>
<td>2154 U (range 1000–4000 U)</td>
</tr>
<tr>
<td>Transfusion</td>
<td></td>
</tr>
<tr>
<td>Mean FFP transfusion before FEIBA</td>
<td>4.76</td>
</tr>
<tr>
<td>Mean FFP transfusion after FEIBA</td>
<td>0.68 (p = 0.0001)</td>
</tr>
<tr>
<td>Mean Platelet transfusion before FEIBA</td>
<td>2.76</td>
</tr>
<tr>
<td>Mean Platelet transfusion after FEIBA</td>
<td>0.52 (p &lt; 0.0001)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coagulation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean INR before FEIBA</td>
<td>1.59</td>
</tr>
<tr>
<td>Mean INR after FEIBA</td>
<td>1.12 (p &lt; 0.0001)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcomes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean hospital length of stay</td>
<td>12.8 days</td>
</tr>
<tr>
<td>Takeback for bleeding</td>
<td>0%</td>
</tr>
<tr>
<td>Mortality</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Conclusions:** Our initial experience with FEIBA administration for the rescue treatment of postoperative coagulopathy and life-threatening bleeding has been favorable. We have observed effective treatment of coagulopathy with cessation of life-threatening bleeding and only one venous thrombotic complication in a patient with other risk factors for this. Further studies are indicated to confirm its efficacy and safety and to determine specific clinical indications for its use in cardiac surgery patients.
OBJECTIVES: National outcomes for simultaneous heart-kidney transplant recipients (HKTx) are not known. We sought to characterize the evolution of combined heart-kidney transplants over time and determine factors that maximize post-transplant heart (HTx) and HKTx survival. We were particularly interested in whether a threshold estimated glomerular filtration rate (Egfr) could be identified that reduced combined HKTx mortality below isolated HTx, and therefore provide a rationale favoring combined organ transplant.

METHODS: A supplemented United Network Organ Sharing Dataset identified isolated HTx and HKTx recipients from 2000–2010. Egfr among HTx was estimated using the 4-MDRD (Modification of Diet in Renal Disease) formula for adults and the Schwartz formula for recipients under age 13 years. Egfr was then log-transformed and recipients were grouped into Egfr quintiles. Kaplan-Meier plots compared time-related mortality among recipients. Multivariable factors for time-related death were sought using Cox proportional hazard regression models.

RESULTS: We identified 26,183 HTx recipients, of whom 593 were HKTx recipients. Although the frequency of isolated HTx increased modestly over time (3.6%), the frequency of HKTx increased dramatically (147%) over the 10 year period (Figure 1). HKTx recipients were older (51 years vs. 45 years), and had higher serum creatinine at the time of transplant (.5 mg/dl vs. 1.1 mg/dl) compared to isolated HTx recipients, $P < 0.001$ for both. Lower Egfr was significantly correlated with diabetes, Caucasian ethnicity, male gender, and age ($P < 0.001$ for all). Risk-unadjusted survival was similar among HTx (8.4 ± 0.04 yrs) and HKTx recipients (7.7 ± 0.2 yrs; $P = 0.76$) (Figure 2). Isolated HTx recipients in the lowest preoperative Egfr quintile had significantly decreased post-transplant survival ($P < 0.001$) compared to HTx recipients with better preoperative renal function (Figure 3). In addition,
isolated HTx recipients in the lowest Egfr quintile (Egfr < mean 37 ml/min) had significantly worse survival than combined HKTx recipients (7.1 ± 0.07 vs. 7.7 ± 0.2, P < 0.001; Figure 4), suggesting that simultaneous kidney transplantation partially restores the post-transplant survival of heart transplant recipients with low Egfr.
CONCLUSIONS: Combined HKTx is increasingly common in the recent era. Recipients with low preoperative Egfr have worse survival after isolated HTx. Combined HKTx restores post-transplant survival in recipients with low Egfr and is a reasonable approach for patients with combined heart and kidney failure.
**18. Effect of Mechanical Assistance of the Systemic Single Ventricle in Single Ventricle Circulation with Cavopulmonary Connection**

Pranava Sinha¹, Nina Deutsch¹, Kanishka Ratnayaka¹, Robert Lederman², Mustafa Kurkluoglu¹, Murfad Peer¹, Dingchao He¹, Mark Nuszkowski¹, Erin Montague¹, Gerald Mikesell¹, Nobuyuki Ishibashi¹, David Zurakowski³, Richard Jonas¹

¹Children’s National Medical Center, Washington, DC; ²National Institutes of Health, Bethesda, MD; ³Boston Children’s Hospital, Boston, MA

**DISCUSSANT: WEN CHENG**

**BACKGROUND:** Previous attempts to support the single ventricle circulation mechanically have suggested that a *custom-built* assist device is needed to *push* rather than *pull* through the pulmonary circulation. We hypothesized that using a *conventional* ventricular assist device, with or without conversion of a total cavopulmonary connection to a bidirectional Glenn cavopulmonary connection would allow assistance by pulling blood through the circuit and improve cardiac index (CI).

**METHODS:** Cavopulmonary connections were established in each of five Yorkshire pigs (25 kg) using ePTFE conduits in a “Y” configuration with appropriate clamping of limbs of the Y to achieve: total cavopulmonary Fontan connection (TCPC), SVC cavopulmonary connection (SVC Glenn) and IVC cavopulmonary connection (IVC Glenn). A common atrium had been established previously by balloon septostomy. Mechanical circulatory assistance of the single systemic ventricle was achieved using a centrifugal pump with common atrial inflow and proximal ascending aortic outflow. CI was calculated using an ultrasonic flow meter placed on the distal ascending aorta and compared between assisted and non-assisted circulation for 3 conditions: TCPC, SVC Glenn and IVC Glenn. Mean pulmonary artery pressure (PAP), common atrial pressure (LAP), arterial oxygen saturation (SAT), partial pressure of arterial oxygen (PO2) and oxygen delivery (DO2) were calculated.

**RESULTS:** Unassisted SVC Glenn CI tended to be higher than TCPC or IVC Glenn (Figure 1). Significant augmentation of total CI was achieved with mechanical assistance for SVC Glenn (109% + 24%, *P* = .04) and also with TCPC (130% + 109%, *P* = .01). Assisted CI achieved at least mean baseline biventricular CI for all 3 support modes. Oxygen delivery was highest for assisted SVC Glenn 1786 + 1307 ml/l/min and lowest with TCPC 1146 + 386 ml/l/min, with a trend toward lower common atrial pressure and lower pulmonary artery pressure for SVC Glenn (Table 1).
Table 1:

<table>
<thead>
<tr>
<th></th>
<th>SVC Glenn Baseline</th>
<th>SVC Glenn Unassisted</th>
<th>SVC Glenn Assisted</th>
<th>IVC Glenn Unassisted</th>
<th>IVC Glenn Assisted</th>
<th>TCPC Unassisted</th>
<th>TCPC Assisted</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI, ml/m²/min</td>
<td>1221 ± 451</td>
<td>1191 ± 747</td>
<td>2517 ± 1741*</td>
<td>781 ± 389</td>
<td>2120 ± 1832</td>
<td>754 ± 357</td>
<td>1494 ± 658*</td>
</tr>
<tr>
<td>PA, mmHg</td>
<td>21.0 ± 13.6</td>
<td>25.3 ± 4.6</td>
<td>22.6 ± 7.3</td>
<td>28.0 ± 4.9</td>
<td>25.6 ± 7.8</td>
<td>27.8 ± 5.6</td>
<td>26.4 ± 8.7</td>
</tr>
<tr>
<td>LAP, mmHg</td>
<td>14.8 ± 2.6</td>
<td>16.6 ± 4.4</td>
<td>14.5 ± 2.7</td>
<td>16.8 ± 7.0</td>
<td>14.0 ± 6.7</td>
<td>18.2 ± 6.3</td>
<td>16.2 ± 6.3</td>
</tr>
<tr>
<td>DO₂, ml/l/min³</td>
<td>1212 ± 566</td>
<td>909 ± 571</td>
<td>1786 ± 1307</td>
<td>862 ± 207</td>
<td>1715 ± 1622</td>
<td>733 ± 147</td>
<td>1146 ± 386</td>
</tr>
</tbody>
</table>

Data presented as Mean ± SD; * Significant differences between assisted vs. unassisted; N = 3

CONCLUSIONS: SVC bidirectional Glenn circulation may allow optimal augmentation of cardiac index and oxygen delivery in a failing single ventricle using a conventional pediatric ventricular assist device. Our model also suggests that the Fontan circulation itself can be supported with systemic ventricular assistance of the single ventricle. We anticipate that newly developed pediatric axial flow pumps will allow a fully implantable system to support the child with a compromised Fontan circulation.
OBJECTIVE: Reoperative Aortic Valve Replacement (re-AVR) in octogenarian is considered high-risk and therefore may be indicated for Transcatheter Aortic Valve Replacement (TAVR). Minimally invasive technique in re-AVR limits dissection and may benefit this patient population. We report the outcomes of re-AVR in high-risk octogenarians who may be considered candidates for TAVR to assess the safety of re-AVR and minimally invasive technique.

METHODS: We identified 105 patients who underwent open reoperative AVR for aortic valve replacement in our institution from January 1997 to December 2011 in patients aged 80 yr or older. Patients with concomitant coronary bypass surgery and/or other valve surgery were excluded. Outcomes of interest included postoperative complications, operative mortality, and mid-term postoperative survival.

RESULTS: Of the 105 patients, 51 patients had minimally invasive procedures through upper hemisternotomy and 54 had standard full sternotomy. Mean age was 82.8 ± 3.8 yrs. 11 patients (10.8%) had CVA, 5 (4.8%) had renal failure, and 66 (62.9%) were in NYHA class III/IV. Cardiopulmonary bypass and crossclamp time were 139 min and 73 min. Postoperatively, 6 patients (5.7%) had reoperation for bleeding, 4 (3.8%) had permanent stroke, 4 (3.8%) had new renal failure and 22 (21.0%) had new onset of atrial fibrillation. Median ICU stay was 73 hrs, median postoperative LOS was 8 d and 30 day readmission rate was 14.3%. Overall operative mortality was 6.7%. In the subgroup analysis, operative mortality was 9.2% in the full sternotomy group and 3.9% in the minimally invasive group (p = 0.048). Kaplan-Meier analysis showed survival benefit both 1 year (79 ± 11.7% vs 92 ± 7.8%) and 5 year (38 ± 17.6% vs 65 ± 15.7%, p = 0.028) favoring minimally invasive approach.
<table>
<thead>
<tr>
<th>Preoperative characteristics</th>
<th>Reop AVR &gt;80 (n=156)</th>
<th>Full sternotomy (n=54)</th>
<th>Minimally invasive (n=51)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (yrs)</strong> mean (sd)</td>
<td>82.8 (3.8)</td>
<td>82.4 (4.5)</td>
<td>83.3 (2.7)</td>
<td>0.270</td>
</tr>
<tr>
<td>Females % (N)</td>
<td>43.8 (46)</td>
<td>46.3 (25)</td>
<td>29.4 (15)</td>
<td>0.107</td>
</tr>
<tr>
<td>Diabetes % (N)</td>
<td>33.3 (36)</td>
<td>20.4 (11)</td>
<td>31.4 (15)</td>
<td>0.264</td>
</tr>
<tr>
<td>Hypercholesterolemia % (N)</td>
<td>84.8 (99)</td>
<td>87.0 (47)</td>
<td>82.4 (42)</td>
<td>0.592</td>
</tr>
<tr>
<td>Hypertension % (N)</td>
<td>83.8 (38)</td>
<td>81.5 (44)</td>
<td>86.3 (44)</td>
<td>0.600</td>
</tr>
<tr>
<td>Renal Failure % (N)</td>
<td>4.8 (5)</td>
<td>7.4 (4)</td>
<td>2.0 (1)</td>
<td>0.364</td>
</tr>
<tr>
<td>Preop creatinine mean (sd)</td>
<td>1.2 (0.4)</td>
<td>1.3 (0.5)</td>
<td>1.2 (0.3)</td>
<td>0.510</td>
</tr>
<tr>
<td>CVA % (N)</td>
<td>10.6 (11)</td>
<td>11.1 (5)</td>
<td>9.8 (5)</td>
<td>1.000</td>
</tr>
<tr>
<td>NYHA Class III/IV % (N)</td>
<td>62.9 (66)</td>
<td>63.0 (34)</td>
<td>62.7 (32)</td>
<td>1.000</td>
</tr>
<tr>
<td>Ejection Fraction (%) med (IQR)</td>
<td>55.0 (50 - 60)</td>
<td>57.0 (55 - 65)</td>
<td>55.0 (50 - 60)</td>
<td>0.701</td>
</tr>
<tr>
<td>Previous CABG % (N)</td>
<td>86.7 (90)</td>
<td>79.6 (43)</td>
<td>92.2 (47)</td>
<td>0.094</td>
</tr>
<tr>
<td>Previous Valve % (N)</td>
<td>26.7 (26)</td>
<td>27.8 (15)</td>
<td>25.5 (13)</td>
<td>0.828</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operative characteristics</th>
<th>Etiology</th>
<th>Reop AVR &gt;80 (n=156)</th>
<th>Full sternotomy (n=54)</th>
<th>Minimally invasive (n=51)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>% (N)</td>
<td>82.1 (86)</td>
<td>81.8 (44)</td>
<td>82.4 (42)</td>
<td>1.000</td>
</tr>
<tr>
<td>Other</td>
<td>% (N)</td>
<td>17.9 (19)</td>
<td>18.2 (10)</td>
<td>17.6 (9)</td>
<td>1.000</td>
</tr>
<tr>
<td>Stenosis</td>
<td>% (N)</td>
<td>81.9 (86)</td>
<td>86.2 (46)</td>
<td>76.4 (49)</td>
<td>0.450</td>
</tr>
<tr>
<td>Insufficiency</td>
<td>% (N)</td>
<td>6.7 (7)</td>
<td>7.4 (4)</td>
<td>6.9 (3)</td>
<td>1.000</td>
</tr>
<tr>
<td>Stenosis/Insufficiency</td>
<td>% (N)</td>
<td>11.4 (12)</td>
<td>7.4 (4)</td>
<td>15.7 (8)</td>
<td>0.223</td>
</tr>
<tr>
<td>Perfusion time (min) med (IQR)</td>
<td>139 (116 - 167)</td>
<td>142 (116 - 165)</td>
<td>139 (126 - 180)</td>
<td>0.936</td>
<td></td>
</tr>
<tr>
<td>Crossclamp time (min) med (IQR)</td>
<td>73 (61 - 94)</td>
<td>75 (63 - 93)</td>
<td>73 (62 - 92)</td>
<td>0.240</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postoperative Outcomes</th>
<th>Reop AVR &gt;80 (n=156)</th>
<th>Full sternotomy (n=54)</th>
<th>Minimally invasive (n=51)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read rate</td>
<td>% (N)</td>
<td>5.7 (5)</td>
<td>3.7 (2)</td>
<td>7.8 (4)</td>
</tr>
<tr>
<td>Permanent stroke</td>
<td>% (N)</td>
<td>0.0 (0)</td>
<td>0.0 (0)</td>
<td>0.0 (0)</td>
</tr>
<tr>
<td>New onset renal failure</td>
<td>% (N)</td>
<td>3.8 (4)</td>
<td>7.4 (4)</td>
<td>0.0 (0)</td>
</tr>
<tr>
<td>Congestive</td>
<td>% (N)</td>
<td>4.8 (5)</td>
<td>3.7 (2)</td>
<td>6.9 (3)</td>
</tr>
<tr>
<td>New onset atrial fibrillation</td>
<td>% (N)</td>
<td>21.0 (22)</td>
<td>26.9 (14)</td>
<td>16.7 (8)</td>
</tr>
<tr>
<td>Ventilation time (hrs) med (IQR)</td>
<td>11.2 (7 - 20)</td>
<td>10.8 (7.1 - 19.8)</td>
<td>13.1 (7.2 - 22.5)</td>
<td>0.617</td>
</tr>
<tr>
<td>ICU stay (hrs)</td>
<td>med (IQR)</td>
<td>73.0 (42 - 121)</td>
<td>73.0 (46 - 121)</td>
<td>73.0 (33 - 129)</td>
</tr>
<tr>
<td>Postop LOS (d)</td>
<td>med (IQR)</td>
<td>8.0 (7 - 12)</td>
<td>8.0 (7 - 12)</td>
<td>9.0 (7 - 15)</td>
</tr>
<tr>
<td>Operative mortality</td>
<td>median</td>
<td>6.7 (7)</td>
<td>9.3 (5)</td>
<td>3.9 (2)</td>
</tr>
<tr>
<td>30d readmissions % (N)</td>
<td>14.3 (15)</td>
<td>14.0 (8)</td>
<td>16.7 (9)</td>
<td>0.784</td>
</tr>
</tbody>
</table>

![Cumulative survival graph](image)
CONCLUSION: Octogenarian patients who undergo re-AVR are thought to be high-risk surgical candidates. This single center series revealed acceptable in-hospital outcomes and operative mortality. Minimally invasive re-AVR was associated with better survival compared to standard full sternotomy and may benefit this population. These data provide a benchmark against which outcomes of transcatheter aortic valve implantation could be compared.

9:50 am – 10:10 am COFFE BREAK, VISIT EXHIBITS & POSTERS, Bays 4-6

NOTES
BACKGROUND: The use of controlled postoperative morning (6 A.M.) blood glucose levels of ≤ 200 mg/dL has been identified as a primary Surgical Care Improvement Project (SCIP) initiative during the initial 48 hours following cardiac surgery. The purpose of this study was to evaluate the effect of achieving controlled blood glucose (CBG) on risk-adjusted postoperative cardiac surgical outcomes.

METHODS: Data were extracted from a certified, single institution Society of Thoracic Surgeons (STS) database for patients undergoing adult cardiac surgical procedures from June 2010–August 2012. Patients were stratified by postoperative 6 A.M. glucose levels into two study cohorts: CBG (≤200 mg/dL) vs. non-CBG (>200 mg/dL). Multiple logistic and linear regression was utilized to measure the association between categories of blood glucose control on risk-adjusted mortality, morbidity, and resource utilization after adjustment for STS predictive risk indices.

RESULTS: A total of 1,703 patients were studied, of whom 1,527 (90%) achieved postoperative morning CBG. Median postoperative day (POD) glucose levels included: POD1 (CBG: 135 vs. non-CBG: 223 mg/dL) and POD2 (CBG: 131 vs. non-CBG: 224 mg/dL, both p < 0.001). Preoperative diabetes was more common among non-CBG patients (69% [n = 122] vs. 30% [n = 464], p < 0.001). Median STS predicted mortality (CBG: 2.0% vs. non-CBG: 2.3%, p = 0.14) was similar between groups. After adjustment for STS predicted risk, non-CBG was not associated with increased mortality (OR = 1.49, p = 0.44), composite major morbidity (OR = 1.51, p = 0.16), deep sternal wound infection/mediastinitis (OR = 1.58, p = 0.68), ICU duration (ß = –6.9, p = 0.70) or postoperative length of stay (ß = 0.69, p = 0.27). Further, among patients undergoing CABG only (Table), similar risk-adjusted results were
observed: mortality (OR = 1.79, p = 0.42), composite major morbidity (OR = 1.08, p = 0.88), ICU duration (ß = –14.8, p = 0.38) or postoperative length of stay (ß = –0.01, p = 0.99).

Table 1: Comparison of Outcomes for CABG Only Cohort (n = 518) As a Function of Achieving Controlled Blood Glucose (CBG) Measures

<table>
<thead>
<tr>
<th>Outcome</th>
<th>CBG (n = 449)</th>
<th>Non-CBG (n = 69)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>9 (2.0%)</td>
<td>3 (4.3%)</td>
<td>0.21</td>
</tr>
<tr>
<td>Perioperative MI</td>
<td>0 (0.0%)</td>
<td>1 (0.6%)</td>
<td>0.28</td>
</tr>
<tr>
<td>Stroke</td>
<td>5 (1.1%)</td>
<td>2 (2.9%)</td>
<td>0.24</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>15 (3.3%)</td>
<td>3 (4.3%)</td>
<td>0.72</td>
</tr>
<tr>
<td>Mediastinitis</td>
<td>1 (0.2%)</td>
<td>0 (0.0%)</td>
<td>&gt;0.99</td>
</tr>
<tr>
<td>Deep Sternal Wound Infection</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>–</td>
</tr>
<tr>
<td>Total ICU LOS (h)</td>
<td>27 [22,65]</td>
<td>26 [20,72]</td>
<td>0.69</td>
</tr>
<tr>
<td>Postoperative LOS (d)</td>
<td>5 [4,7]</td>
<td>5 [4,7]</td>
<td>0.51</td>
</tr>
</tbody>
</table>

*Results reported as median [25th, 75th percentile]. CBG (BG ≤ 200 mg/dL); Non-CBG (BG > 200 mg/dL); MI = myocardial infarction; ICU = Intensive Care Unit; LOS = Length of Stay.

CONCLUSIONS: Achieving controlled postoperative 6 A.M. blood glucose levels ≤200 mg/dL following cardiac surgery is not associated with improved risk-adjusted mortality, morbidity, or hospital resource utilization. These data suggest that this metric may not be a valid proxy of postoperative cardiac surgical quality.
OBJECTIVES: To predict thoracic surgery workforce requirements using a novel supply-demand model.

METHODS: Using Canadian Census Public Use Microdata Files and the Canadian Community Health Survey, data on 300,000 individuals was used to develop a microsimulation model representing the total national population. The demand component of the model simulates the incidence of lung cancer taking into account population demographics, immigration, emigration, non-lung cancer mortality, geographic location, smoking status (current, former, never, pack years, quit time, recidivism), frequency of radiologic imaging and socioeconomic status. The supply component of the model simulates the number of practicing thoracic surgeons, including their age distribution, retirement plans, number of new graduates and their demographic distribution. The full model predicts outcomes based on varying numbers of graduates per year.

RESULTS: From 2011 to 2030 the national population will increase from 33 to 43 million. Based on model predictions, lung cancer incidence rates will rise until 2030, then plateau and subsequently decline. The rate of increase varies substantially by region (12.5% in Western Canada to 37.2% in Eastern Canada), and is less pronounced in major cities (10.3%). Minor fluctuations in yearly thoracic surgery graduation rates (from 4 to 8 fellows per year) dramatically impact the future number of practicing surgeons (range of 116 to 215 surgeons in the year 2030). The rates of operable lung cancer per thoracic surgeon will similarly vary from 35.0 to 64.9 cases per surgeon per year. Training 8 surgeons per year will maintain the current rate of operable lung cancer per surgeon per year through 2030 (ranging from 32–36 operable lung cancers per surgeon per year), however this increased rate of training will outpace lung cancer incidence as it plateaus and then declines after 2030.
CONCLUSIONS: Our model predicts that, at the current rate of training, the incidence of operable lung cancer will increase both overall and relative to the supply of thoracic surgeons in Canada until the year 2030. However, even minor increases in the rate of training may be problematic as lung cancer incidence plateaus and commences to decline after 2030. Unregulated workforce changes will dramatically change the number of thoracic surgeons entering the workforce and such changes should be approached with care. The impact of new diagnostic tests (eg. CT screening) and treatment modalities (eg. stereotactic radiotherapy) on workforce planning remains uncertain and will need to be factored into the development of future versions of the model.
+22. Outcomes in Patients Undergoing HeartMate II Versus Heartware Left Ventricular Assist Device as a Bridge to Transplantation—A Single Center Experience

Anton Sabashnikov, Bartlomiej Zych, Prashant N. Mohite, Rachel Hards, Aron-Frederik Popov, Diana Garcia, Massimo Capoccia, André Simon

Royal Brompton & Harefield NHS Foundation Trust, London, United Kingdom

DISCUSSANT: JACK G. COPELAND

OBJECTIVES: Ventricular assist devices (VAD) have become standard treatment for patients with advanced heart failure. We present data comparing the results after implantation of the HeartMate II (HM II) vs. the Heartware (HW) for the last 7 years at our institution.

METHODS: Between July 2006 and August 2012, 121 consecutive patients underwent LVAD implantation: 71 (57.9%) HM II, 50 (42.1%) HW. Patient demographics, perioperative characteristics and laboratory parameters as well as postoperative outcome were compared retrospectively. Data are given as mean ± SD or median (interquartile range) and analyzed with T-test, Mann Whitney U, Chi2, Fisher exact test and Kaplan-Meier survival estimation.

RESULTS: Patients were significantly younger in the HM II group: 43.4 (28.7;52.7) vs. 49.3 (44.2;57.3) years (p < 0.01). Pre-implantational liver function was more deranged in HM II patients: bilirubin: 34 (18;51) vs. 24 (18;35) mmol/l (p = 0.02); ALT 39 (22;103) vs. 30 (19;42) U/L (p = 0.01).

HM II patients had a significantly higher rate of preoperative infections requiring antibiotic treatment: 7 (10%) HM II vs 0 HW (p = 0.02), had a higher body core temperature: 36.8 ± 0.6 vs. 36.3 ± 0.5 oC (p < 0.01) and showed a trend towards higher CRP levels: 30 (9;56) vs. 12 (5;50) mg/L (p = 0.09).

Other demographic and preoperative parameters were comparable.

Postoperatively, HM II patients had a significantly higher transfusion rate: 15 (6;24) vs 8 (2;18) units, but there were no differences in re-sternotomy for bleeding (p = 0.156).

The groups were comparable for requirement of long term (>7 days) mechanical ventilation (p = 0.461) and inotropic support (p = 0.375), right ventricular failure

+ Samson Resident Prize Essay
requiring right ventricular assist device implantation (p = 0.384) and renal failure requiring renal replacement therapy (p = 0.542).

There was no difference in ICU length of stay (LOS) (p = 0.10), however, HM II patients had a longer postoperative hospital LOS: 54 (30;79) vs 32 (27;57) days (p = 0.02).

Recovery and VAD explantation were more likely in the HM II group: 17 (24.3%) vs 2 (3.9%) patients (p = 0.02).

While there was no significant difference in survival (log rank test p = 0.986, Breslow test p = 0.827, Figure 1), HM II patients were more likely to develop a drive line infection requiring antibiotic therapy: 27 (38.6%) vs 6 (11.8%) (p = 0.01).

CONCLUSIONS: Both HM II and HW provide similar early postoperative outcome and good long term survival. The differences observed between the groups may be related to demographic and preoperative factors rather than to the type of the device used. These observations should be a merit of further analysis.
11:10 am – 12:00 pm  **CONTROVERSIES IN THORACIC SURGERY**

*Studies Drawn from Large Administrative Databases Are Not Clinically Relevant*

Moderator: Paul H. Schipper  
They Are Not Relevant: Brian L. Reemtsen  
They Are Relevant: Karl F. Welke  

12:00 pm – 12:30 pm  **ANNUAL BUSINESS MEETING** (Members Only), Bays 1-3  

12:30 pm – 2:00 pm  **FAMILY LUNCHEON**, Lakeview Terrace  

7:00 pm – 10:00 pm  **KIDS & TEENS BANQUET**, Casco Bay  

7:00 pm – 11:00 pm  **PRESIDENT’S RECEPTION AND BANQUET**  
Black Tie Optional  
Reception:  *Mish-A-Nock*  
(docked, Boardwalk Marina, east side)  
Banquet:  *Bays 1-3*  

NOTES
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, not withstanding 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 pro-
grams. Such guests shall be expected to bear the expenses related to their par-
ticipation 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 pur-
poses 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.
NECROLOGY

Thomas B. Ferguson, MD, St. Louis, MO
William H. Moncrief, Jr., MD, Fort Belvoir, VA
Aguedo A. Retodo, Jr., MD, Hayward, CA
Benson B. Roe, MD, San Rafael, CA
Herbert E. Sloan, MD, Ann Arbor, MI
Harold C. Urschel, Jr., MD, Dallas, TX
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
ROSTER

James B.D. Mark
1992–1993

Daniel J. Ullyot
1996–1997

David R. Clarke
2000–2001

Steven W. Guyton
2004–2005

Marvin Pomerantz
1993–1994

Winfield J. Wells
1997–1998

Donald B. Doty
2001–2002

R. Scott Mitchell
2005–2006

D. Craig Miller
1994–1995

Kent W. Jones
1998–1999

Edward D. Verrier
2002–2003

Elliot T. Gelfand
2006–2007

Richard G. Sanderson
1995–1996

Bradley J. Harlan
1999–2000

Vaughn A. Starnes
2003–2004

Douglas E. Wood
2007–2008
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
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.

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
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

<table>
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<tr>
<th>Year</th>
<th>Location</th>
<th>President</th>
<th>Secretary</th>
<th>Local Arrangements Chairman</th>
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<td>1979</td>
<td>Sun Valley Lodge, Sun Valley, Idaho</td>
<td>Norman E. Shumway</td>
<td>Arthur N. Thomas</td>
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<td>Paul A. Ebert</td>
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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

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<td>1992</td>
<td>Hyatt Regency Hotel, Kauai, Hawaii</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>
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<td>1994</td>
<td>Resort at Squaw Creek, Olympic Valley, California</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>
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<td><strong>The Coeur d’Alene Resort, Coeur d’Alene, Idaho</strong></td>
<td>D. Craig Miller</td>
<td>Kent W. Jones</td>
<td>Ronald P. Grunwald</td>
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<td>Tucson, Arizona</td>
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<td>Hillsborough, California</td>
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<td>1998</td>
<td><strong>The Chateau Whistler Resort, Whistler, B.C., Canada</strong></td>
<td>Winfield J. Wells</td>
<td>Vaughn A. Starnes</td>
<td>W.R. Eric Jamieson</td>
<td>Vivek Rao</td>
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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</td>
<td>R. Scott Mitchell</td>
<td>Winfield J. Wells</td>
<td>Frederick A. Tibayan</td>
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<td>Fairmont Empress Hotel, Victoria, BC, Canada</td>
<td>Steven W. Guyton</td>
<td>John A. Hawkins</td>
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<td>Matthew G. Whitten</td>
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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 Keahou 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*  
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 Chairman  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
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

Crystalloid 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 Cass Study Stand up?
Richard P. Anderson, MD, Seattle, WA

1986  Cell Membranes – Implications on Cancer Control
Jonathan Singer, MD, San Diego, CA

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

1987  Anti-Platelet Therapy – Practical Clinical Strategies for Bypass Graft
Patients
Laurence A. Harker, MD, La Jolla, CA

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

1988  Single Lung Transplantation  
       F. Griffith Pearson, MD, Toronto, Ontario, Canada

1989  Challenges of the Heights: Limits For Survival  
       Michael Wiedman, MD, Boston, MA

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

1990  Cellular and Molecular Biology of Lung Cancer: Clinical Implications  
       Martin F. 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
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
**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.

TSFRE supports research and education initiatives to:

- Expand the specialty’s knowledge about cardiothoracic surgical treatment options
- Enhance the care of patients with cardiothoracic diseases
- Develop the skills of cardiothoracic surgeons, both as surgeon-scientists and as health policy leaders

In its 25th year, TSFRE has supported over $11 million toward thoracic 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
- Donate online at www.tsfre.org/online-donation/
- Donate by mail: TSFRE, 633 North St. Clair Street, 23rd Floor, Chicago, IL 60611

To receive more information about giving opportunities or TSFRE Awards, please contact Priscilla S. Page, TSFRE Executive Director, at (312) 202-5868, or by e-mail at ppage@tsfre.org.
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Richard Pierson, MD
Robert C. Robbins, MD
David J. Sugarbaker, MD

John S. Ikonomidis, MD, PhD, Chair, TSFRE Research and Education Committee
Priscilla S. Page, Executive Director
2013 TSFRE RESEARCH 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).

Bryan Burt, MD, Stanford University
“Characterization and Immunodulation of Tumor-Associated Macrophages in Malignant Pleural Mesothelioma”

TSFRE/NCI Jointly Sponsored Mentored Clinical Scientist Development Awards (TSFRE/NCI/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 NCI award period.

Kal Parekh, MD, University of Iowa
“Ferret Lung Transplant: An Orthotopic Model of Obliterative Bronchiolitis”

TSFRE Research Fellowship: Support of up to $30,000 a year for up to two years for surgical residents who have not yet completed cardiothoracic surgical training.

Paul Wehman, MD, University of Maryland
“The Effect of Autologous Cardiac Stem Cells in a porcine Model of Pressure Induced Right Ventricular Dysfunction”

TSFRE Nina Starr Braunwald Research Grant: Operational support of original research efforts by women cardiac 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 per year for up to two years are made each year to support the work of an early-career woman cardiac surgeon (within five years of first faculty appointment).

Meena Nathan, MD, Boston Children’s Hospital
TSFRE Nina Starr Braunwaald 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.

Amy Fiedler, MD, Brigham and Women’s Hospital
“Chronic Ventricular Restraint in Right Heart Failure”

2013 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:

Kathleen Fenton, MD
Lauren Kane, MD
Scott LeMaire, MD
Mattias Loeb, MD
John Nigro, MD
Bernard Park, MD
Wing Yeen, MD

Surgeons as Educators Course Scholarship Recipients:

Andrea J. Carpenter, MD
Chris S. Malaisrie, MD
Frank Manetta, MD
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<th>M</th>
<th>Last Name</th>
<th>Suffix</th>
</tr>
</thead>
</table>

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
Speaker Ready

registration

the Bayview Rooms
3,010 square feet of waterfront meeting space in the conference center
64x208 foot cube dimension (Bay 1G open)

Exhibits

the Conference Center Bays
11,100 square feet in the conference center
64x208 foot cube dimension (Bay 1G open)

Scientific Session

the cabins
1,088 square feet on the lobby level

The Coeur d'Alene

the Seventh Floor Boardrooms
5,500 square feet overlooking Coeur d'Alene
from the seventh floor of the Resort
# SCHEDULE OF EVENTS

**WEDNESDAY, June 26, 2013**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 a.m.</td>
<td>Council Meeting</td>
<td>Boardroom 6</td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td>Registration</td>
<td>Conference Center Registration</td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td>Speaker Ready Room</td>
<td>Beauty Bay</td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td>New Members / Welcome Reception</td>
<td>Lakeview Terrace</td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td>Kids &amp; Teens Reception (Ages 3-18)</td>
<td>Front Plaza</td>
</tr>
</tbody>
</table>

**THURSDAY, June 27, 2013**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 a.m.</td>
<td>Samson Fun Run</td>
<td>Start Line: Front Plaza</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Breakfast</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Family Hospitality</td>
<td>Boardroom SABC</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Exhibits</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Speaker Ready Room</td>
<td>Beauty Bay</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Registration</td>
<td>Conference Center Registration</td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>Scientific Session I</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>New Member &amp; Samson Prize Finalists</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>9:10 a.m.</td>
<td>Presidential Address</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>9:55 a.m.</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>Spouse Forum Session</td>
<td>Casco Bay</td>
</tr>
<tr>
<td>10:20 a.m.</td>
<td>Scientific Session II</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>11:40 a.m.</td>
<td>C. Walton Lillehei Point/Couterpoint Sess</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>12:30 p.m.</td>
<td>Whitewater Rafting Excursion*</td>
<td>Depart from Hotel Entrance</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>Historical Tour of Coeur d’Alene*</td>
<td>Depart from Hotel Entrance</td>
</tr>
<tr>
<td>6:00 p.m.</td>
<td>Lewis &amp; Clark Theme Dinner</td>
<td>Hagadone Event Center</td>
</tr>
</tbody>
</table>

*Separate Subscription Required

**FRIDAY, June 28, 2013**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 a.m.</td>
<td>Registration</td>
<td>Conference Center Registration</td>
</tr>
<tr>
<td>6:00 a.m.</td>
<td>Speaker Ready Room</td>
<td>Beauty Bay</td>
</tr>
<tr>
<td>6:30 a.m.</td>
<td>Breakfast</td>
<td>Casco Bay &amp; Kidd Island Bay</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Breakfast</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Family Hospitality</td>
<td>Boardroom SABC</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Exhibits</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>Postgraduate Course I</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>8:40 a.m.</td>
<td>Postgraduate Course II</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>9:20 a.m.</td>
<td>Scientific Session III</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>Scientific Session IV</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>Golf Tournament*</td>
<td>Coeur d’Alene Golf Course</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>Tennis Tournament*</td>
<td>Coeur d’Alene Tennis Courts</td>
</tr>
</tbody>
</table>

*Transportation for both Golf and Tennis Tournaments departs from Eagle Shuttle Marina, West side starting at 12:45 p.m.*

**SATURDAY, June 29, 2013**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 a.m.</td>
<td>Speaker Ready Room</td>
<td>Beauty Bay</td>
</tr>
<tr>
<td>6:00 a.m.</td>
<td>Registration</td>
<td>Conference Center Registration</td>
</tr>
<tr>
<td>6:30 a.m.</td>
<td>Breakfast</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>6:30 a.m.</td>
<td>Exhibits</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>Concurrent Forums</td>
<td></td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>A) Adult Cardiac Session</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>B) General Thoracic Session</td>
<td>Casco Bay</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>C) Congenital Heart Disease Session</td>
<td>Kidd Island Bay</td>
</tr>
<tr>
<td>8:30 a.m.</td>
<td>Scientific Session V</td>
<td>Boardroom SABC</td>
</tr>
<tr>
<td>9:50 a.m.</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Bays 4-6</td>
</tr>
<tr>
<td>10:10 a.m.</td>
<td>Scientific Session VI</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>11:10 a.m.</td>
<td>Controversies in Thoracic Surgery</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td>Business Meeting (Members Only)</td>
<td>Bays 1-3</td>
</tr>
<tr>
<td>12:30 p.m.</td>
<td>Family Luncheon</td>
<td>Lakeview Terrace</td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td>Kids &amp; Teens Banquet (Ages 3-18)</td>
<td>Casco Bay</td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td>President’s Reception &amp; Banquet</td>
<td>Reception: Mish-A-Nock</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Boardwalk Marina, East side)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Banquet: Bays 1-3</td>
</tr>
</tbody>
</table>

*Black Tie Optional*