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* These sections available on site in Ojai, California, or by logging into the Members Only Area of the WTSA Website at http://members.westernthoracic.org/.
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John C. Chen
Honolulu, Hawaii

Editor
Lawrence H. Cohn
Boston, Massachusetts

36TH ANNUAL MEETING Ojai Valley Inn, Ojai, California

2009–2010 COMMITTEES

LOCAL ARRANGEMENTS COMMITTEE
Dominic and Carolyn Tedesco, Co-Chairs & Samson Fun Run
Joseph C. Cleveland, Jr., Golf Tournament
John C. Chen, Tennis Tournament

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Myles S. Guber (2012)
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Richard I. Whyte (2010)

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Elliot T. Gelfand (2011)
R. Scott Mitchell (2010)
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Gordon A. Cohen (2011)
Anthony P. Furnary (2012)
Mark T. Metzdorff (2012)
Ross M. Ungerleider (2011)
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Honolulu, Hawaii

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

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

Ojai Valley Inn, Ojai, California
36TH ANNUAL MEETING

SCHEDULE OF EVENTS

WEDNESDAY, June 23, 2010
9:00 am – 1:00 pm  Council Meeting
Libbey Boardroom
1:00 pm – 6:00 pm  Registration
Hacienda Foyer
1:00 pm – 6:00 pm  Speaker Ready Room
Hacienda Hallway
7:00 pm – 9:00 pm  New Members Reception
Herb Garden Pool
7:00 pm – 9:00 pm  Kids & Teens Reception (Ages 5–18)
Common Pool

THURSDAY, June 24, 2010
6:00 am  Samson Fun Run
Arbolada Parking Lot near Spa Ojai
7:00 am – 8:00 am  Continental Breakfast
Anacapa Ballroom
7:00 am – 11:00 am  Family Hospitality
Oak Café
7:00 am – 12:00 pm  Registration
Hacienda Foyer
7:00 am – 12:00 pm  Exhibits
Anacapa Ballroom
7:00 am – 12:00 pm  Speaker Ready Room
Hacienda Hallway
8:00 am – 9:00 am  Scientific Session I
Hacienda Ballroom
9:00 am – 9:10 am  Introduction of New Members and Resident Essay Finalists
Hacienda Ballroom
9:10 am – 9:55 am  Presidential Address
Hacienda Ballroom
9:55 am – 10:20 am  Coffee Break, Visit Exhibits & Posters
Anacapa Ballroom
10:20 am – 11:40 am  Scientific Session II
Hacienda Ballroom
FRIDAY, June 25, 2010

6:00 am – 12:00 pm  Registration
Hacienda Foyer
6:00 am – 12:00 pm  Speaker Ready Room
Hacienda Hallway
6:30 am – 7:30 am  Simultaneous Breakfast Sessions*:
A) Adult Cardiac Session
Hacienda Ballroom
B) General Thoracic Session
Garden Room
C) Congenital Heart Disease Session
Libbey Boardroom
7:00 am – 11:00 am  Family Hospitality
Oak Café
7:30 am – 8:00 am  Continental Breakfast
Anacapa Ballroom
7:30 am – 12:00 pm  Exhibits
Anacapa Ballroom
7:55 am – 8:00 am  David J. Dugan Award Presentation
Hacienda Ballroom
8:00 am – 8:50 am  Postgraduate Course
Hacienda Ballroom
8:50 am – 10:30 am  Scientific Session III
Hacienda Ballroom
10:30 am – 11:00 am  Coffee Break, Visit Exhibits & Posters
Anacapa Ballroom
11:00 am – 12:00 pm  Scientific Session IV
Hacienda Ballroom

SATURDAY, June 26, 2010

6:00 am – 11:30 am  Speaker Ready Room
Hacienda Hallway
6:00 am – 12:00 pm  Registration
Hacienda Foyer
6:30 am – 7:30 am  Continental Breakfast
Anacapa Ballroom
6:30 am – 10:30 am  Exhibits
Anacapa Ballroom
7:00 am – 8:15 am  Concurrent Forums
A) Adult Cardiac Session
Hacienda Ballroom
B) General Thoracic Session
Garden Room
C) Congenital Heart Disease Session
Libbey Boardroom
7:00 am – 11:00 am  Family Hospitality
Oak Café
8:25 am – 8:30 am  Significance of Paul Samson to the WTSA
Hacienda Ballroom
8:30 am – 9:50 am  Scientific Session V
Hacienda Ballroom
9:50 am – 10:10 am  Coffee Break, Visit Exhibits & Posters
Anacapa Ballroom
10:10 am – 11:10 am  Scientific Session VI
Hacienda Ballroom
11:10 am – 12:00 pm  C. Walton Lillehei Point-Counterpoint
Hacienda Ballroom

*Separate Subscription Required
12:00 pm – 12:30 pm  Business Meeting (Members Only)
    Hacienda Ballroom
12:30 pm – 2:00 pm  Family Luncheon
    Herb Garden and Recreation Field
7:00 pm – 10:00 pm  Kids & Teens Banquet (Ages 5–18)
    Garden Room
7:00 pm – 11:00 pm  President’s Reception & Banquet (Black Tie Optional)
    Hacienda Foyer and Plaza/Hacienda Ballroom

Ojai Valley Inn, Ojai, California  36TH ANNUAL MEETING

GENERAL INFORMATION

1. REGISTRATION
The Registration Desk will be located in the Hacienda Foyer during the following hours:

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Wednesday</td>
<td>1:00 pm – 6:00 pm</td>
</tr>
<tr>
<td>Thursday</td>
<td>7:00 am – 12:00 pm</td>
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<tr>
<td>Friday</td>
<td>6:00 am – 12:00 pm</td>
</tr>
<tr>
<td>Saturday</td>
<td>6:00 am – 12:00 pm</td>
</tr>
</tbody>
</table>

2. SPEAKER READY ROOM
The Speaker Ready Room will be located at the end of the Hacienda Hallway, outside the entrance to Hacienda Ballroom A. 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 23rd). All presentations must be submitted in PowerPoint format only.

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 WTSA. The AATS is accredited by the ACCME to provide continuing medical education for physicians.

The American Association for Thoracic Surgery designates this educational activity for a maximum of \(12.75\) AMA PRA Category 1 Credit(s)™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

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

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

Content Areas
The content areas of the WTSA’s CME program 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, and concurrent forums 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.

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

This year’s program begins on Thursday with a half-day scientific plenary session of original papers and concludes with the highly successful “Controversies in Thoracic Surgery”. The controversies debate addresses whether “The Future of CT Practice is an Employed Model”.

Friday morning begins with three simultaneous breakfast sessions, featuring recognized leaders in Adult Cardiac, General Thoracic, and Congenital Heart Disease, who will provide state-of-the-art techniques and procedures in each specialty. The scientific program continues with the annual Postgraduate Course, 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 the C. Walton Lillehei Point/Counter-Point Session, sponsored by an educational grant from St. Jude Medical. The debate this year will focus on whether “Attending Surgeons Should Be Held to an 80-Hour Workweek”. 
At the conclusion of the Annual Meeting, participants should have an enhanced understanding of the latest techniques and current research specifically related to the fields of adult cardiac, general thoracic, and congenital heart disease clinical surgery, experimental surgery and related sciences, surgical education, and the socioeconomic aspects of surgical care. Through the open discussion periods for each of the six plenary Scientific Sessions, the Controversies in Thoracic Surgery session, the three Simultaneous Breakfast sessions, the Postgraduate Course, the Concurrent Forums on Adult Cardiac, General Thoracic and Congenital Heart Disease, and the Point/Counterpoint session, participants will have the opportunity to hear the pros and cons of each paper and/or debate presented to gain an overall perspective of their current practices and utilize results presented to select appropriate surgical procedures and interventions for their own patients and integrate state-of-the-art knowledge into their current practice and/or research.

6. DISCLOSURE STATEMENT

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

The WTSA is also required to manage any reported conflict by invited speakers, presenting authors, discussants, and moderators, and to eliminate the potential for bias during the activity. Conflicts listed on pages 243–254 have been managed to the Association's satisfaction. However, if you perceive a bias during a session, please report the circumstances on the session's online evaluation.

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

The requirement for disclosure is not intended to imply any impropriety of such relationships, but simply to identify such relationships through full disclosure, and to allow the audience to form its own judgments regarding the presentation.
10. 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 Reception on Wednesday evening, the Thursday morning Samson Fun Run, the Taste of Ojai Street Festival Theme Dinner on Thursday evening, the Saturday Family Luncheon, the President’s Reception and Banquet on Saturday evening, and daily continental breakfasts (served in the Exhibit Hall for meeting attendees and in the Hospitality Suite, located in the Oak Café, for family members). Supervised Kids and Teens Receptions, for ages 5-18, will provide dynamic, entertaining, and safe programs during Wednesday’s New Members Reception and Saturday’s President’s Banquet.

NEW MEMBERS RECEPTION

Wednesday, June 23  7:00 pm – 9:00 pm

Join the WTSA in welcoming its new members at the Herb Garden Pool. Heavy hors d’oeuvres will be served. Meeting registration is required to attend this function.

Children ages 5-18 will attend their own Kids and Teens Welcome Reception, to be held concurrently at the Common Pool. Join Camp Ojai at the main pool for a special dinner and a movie! Buffet dinner, popcorn & floating noodles for in-water seating will be available. Children must be registered for the meeting to attend this function.

SAMSON FUN RUN

Thursday, June 24  6:00 am

The Samson fun run kicks off near the beautiful Spa Ojai heading around the majestic oak and up the hill past the manicured fairways of the Ojai Valley Inn’s Magnificent Championship golf course that was built in 1923. The fun run course then meanders thru the heart of the hotel grounds. Participants will be rewarded for their efforts with incredible views of the Topa Topa Mountains as they make their way to the historic Ojai hike and bike trail. This trail was originally the route of the Southern Pacific Railway and leads runners into the heart of Ojai. The course will then backtrack, sending runners to a down hill sprint to the finish. All participants will receive an official Samson Fun Run T-shirt at the finish line. Prizes will be presented at the Saturday luncheon.

TASTE OF OJAI STREET FESTIVAL THEME DINNER

Thursday, June 24  6:30 pm – 10:00 pm

Attendees will enter the Herb Garden to the bustle of a “Street Festival” in full swing consisting of all the flavors of Ojai Valley including local artisans, jewelry designers, food and entertainment. Ojai is an incredible art community, and the evening will bring these local artisans together for a fun and interactive event that provides the WTSA attendees insight into everyday living in Ojai. Meeting registration is required to attend this function.

SATURDAY LUNCHEON

Saturday, June 26  12:30 pm – 2:00 pm

Join registered physicians, spouses, guests, and family members for this outdoor luncheon at the Herb Garden and Recreation Field and applaud award winners from the Samson Fun Run and Golf and Tennis Tournaments. (Sporting event winners must be present to accept their prizes.) Meeting registration is required to attend this function.

PRESIDENT’S RECEPTION AND BANQUET

Saturday, June 26  7:00 pm – 11:00 pm

The 36th Annual Meeting will conclude with the Presidential Reception and Banquet in the Hacienda Foyer and Plaza and the Hacienda Ballroom. You won’t want to miss one of LA’s hottest bands, Sharky and the Babes. They will be sure to keep the room dancing for hours! Dress is black tie optional. Meeting registration is required to attend this function.

Family members aged 5-18 will be in for their own fun evening during the concurrent Kids and Teens Banquet in the Garden Room. Children must be registered for the meeting to attend this function.
GOLF/ TENNIS TOURNAMENTS

(Separate Subscription Required)

GOLF TOURNAMENT
George C. Thomas, Jr., Championship Golf Course

Friday, June 25 1:00 pm

In a setting as natural as Ojai, it is only fitting that one of America’s premier championship golf courses will be home to the WTSA Annual Golf Tournament. The world-class Ojai Country Club was one of the first great golf courses in California. Designed and built in 1923 under the direction of George C. Thomas, Jr. and Billy Bell, the course was hailed as “a marvel of golfing architecture.” Thomas had two initial considerations for the Ojai course: “...that the average golfer could enjoy his round without too great a penalty, and that a test must be afforded requiring the low-handicap man to play fine golf in order to secure pars.” Pre-registration is required with indication of handicap.

$250 per person includes, greens fees, box lunch, cart and prizes.

TENNIS
Tennis Center

Friday, June 25 2:00 pm

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

$30 per person includes courts, refreshments and prizes.

CHILD CARE SERVICES

CAMP OJAI (For Children 5–12 years old)

The director of Camp Ojai is California credentialed and the trained, professional counselors are certified in CPR and First Aid. Transportation for off-grounds excursions is provided by Ojai Valley Inn & Spa staff and vehicles. All vehicles are fully equipped with seat belts and car seats/booster seats.

Due to the state-mandated counselor-to-child ratio, reservations must be made a minimum of 24 hours in advance. For information and reservations, please contact the Ojai Valley Inn concierge desk at (805) 646-1111, or within the Inn, contact extension 51.

MUMMY’S DAY OFF

For child care needs and additional information, please contact Mummy’s Day Off directly at (805) 570-6171 or visit their website at www.mummysdayoff.com. Rates vary depending on the number of children and location. To inquire about rates please call (805) 570-6171. Please note there is a four hour minimum for service as well as a 24 hour cancellation policy.

THE RONALD REAGAN PRESIDENTIAL LIBRARY AND MUSEUM TOUR

Transportation to depart from front entrance of hotel

Thursday, June 24 12:45 pm – 5:00 pm

Cost: $80.00

Itinerary and Highlights:

- Hotel pick up and drop off
- Explore the magnificent Inside the White House exhibit
- Enjoy all that the Air Force One Pavilion has to offer, including tours on board President Reagan’s Air Force One
- View a full scale replica of President Reagan’s Oval Office
- Enjoy breathtaking views of Conejo Valley
- View a portion of the Berlin Wall
- Reflect at President Reagan’s gravesite
Tour Includes:
• Round trip transportation
• Lunch
• Dedicated docent to guide tour

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

Be sure to utilize the concierge services by contacting them at 805-646-1111 or by visiting them directly.

ACKNOWLEDGMENTS
The Western Thoracic Surgical Association wishes to thank the following companies and organizations for their educational and marketing support of the 36th Annual Meeting:

EDUCATIONAL GRANTS (Confirmed through May 21, 2010)
Silver Level
Medtronic, Inc.
St. Jude Medical, Inc.
White Memorial Medical Center and Foundation – Lyman A. Brewer, III, Fund for their support of the Postgraduate Course
Medtronic for their support of the Donald B. Doty Education Award

Corporate Level
Edwards Lifesciences

MARKETING SUPPORT (Confirmed through May 21, 2010)
MAQUET Cardiovascular

EXHIBIT SUPPORT (Confirmed through May 21, 2010)
Accumetrics
AtriCure, Inc.
ATS Medical, Inc.
Baxter Healthcare
Biomet Microfixation
Cardiac Assist, Inc.
Cardima
CardioNet
Cormatrix Cardiovascular, Inc.
Covidien
CryoLife, Inc.
Edwards Lifesciences
Elsevier
Estech
Gore & Associates, Inc.
Intuitive Surgical, Inc.
KLS Martin, LP

LifeNet Health
Lundbeck Inc.
MAQUET Cardiovascular
Medtronic Inc.
Merit Endotek
Neomend, Inc.
On-X Technologies, Inc.
Scanlan International, Inc.
Somanetics Corporation
Sorin Group
Sorin Heart Valves
Spiration
St. Jude Medical, Inc.
Synthes CMF
Terumo Cardiovascular Systems
Thoratec Laboratories Corporation
Vitalcor, 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 at the end of the Hacienda Hallway, outside the entrance to Hacienda Ballroom A, 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 23rd). 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 discussants should register with the Secretary in the science room (Hacienda Ballroom) prior to the opening of the session during which the paper is to be presented. All discussions will be presented from floor microphones.

4. In publication, it is customary to group discussions together on a series of papers. Transcription of the discussions will be forwarded to discussants for review and correction. Any delay in the return of corrected discussions means that publication of all papers on the subject will be held up. Such a delay is manifestly unfair to those who are conscientious in the prompt submission of their remarks. Unreasonable delay will preclude publication.

PROGRAM

WEDNESDAY, JUNE 23, 2010

1:00 pm – 6:00 pm REGISTRATION, Hacienda Foyer
1:00 pm – 6:00 pm SPEAKER READY ROOM, Hacienda Hallway
7:00 pm – 9:00 pm NEW MEMBERS RECEPTION, Herb Garden Pool
7:00 pm – 9:00 pm KIDS & TEENS RECEPTION, Common Pool (AGES 5–18)

THURSDAY, JUNE 24, 2010

6:00 am SAMSON FUN RUN, Arbolada Parking Lot
7:00 am – 8:00 am CONTINENTAL BREAKFAST, Anacapa Ballroom
7:00 am – 11:00 am FAMILY HOSPITALITY, Oak Café
7:00 am – 12:00 pm REGISTRATION, Hacienda Foyer
7:00 am – 12:00 pm SPEAKER READY ROOM, Hacienda Hallway
7:00 am – 12:00 pm EXHIBITS, Anacapa Ballroom

8:00 am – 9:00 am SCIENTIFIC SESSION I

Hacienda Ballroom
Moderators: Robbin G. Cohen
J. Scott Millikan
(10 minutes presentation, 10 minutes discussion)

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

• Discuss current investigations and novel approaches in the management of adult cardiac, general thoracic and congenital heart disease patients suffering from an array of surgical conditions relating to the heart, lungs, organs of the thorax, and other airway/circulation diseases;
• Discuss current basic science investigations relating to advances in the treatment and management of cardiothoracic and/or congenital heart disease patients and conditions; and
• Discuss current investigative studies in clinical outcomes for patients with surgical cardiothoracic and/or congenital heart disease disorders or pathologies.

1. Surgical Treatment of Atrial Fibrillation Restores Expected Survival in Patients Undergoing Valvular Heart Surgery
   Richard Lee, Muthiah Vaduganathan, Edward Wang, Jane Kruse, Edwin C. McGee, Jr., S.C. Malaisrie, Robert O. Bonow, Patrick M. McCarthy*
   Bluhm Cardiovascular Institute, Division of Cardiothoracic Surgery at Northwestern University, Feinberg School of Medicine and Northwestern Memorial Hospital, Chicago, IL
   DISCUSSANT: JOHN R. DOTY

2. Congenital Heart Surgery Is No Longer a Specialty of Small Children and Infants: Analysis of 29 Million Pediatric Discharges
   David L.S. Morales, Farhan Zafar, Daniel E. Graves, Wayne J. Franklin, Douglas S. Moodie, Charles D. Fraser, Jr., Jeffrey F. Heinle
   Baylor College of Medicine, Houston, TX
   DISCUSSANT: VAUGHN A. STARNES

3. Preservation of the Esophagus with Endoscopic Therapy of High-Grade Dysplasia and Intramucosal Adenocarcinoma, an Alternative to Esophagectomy
   Joerg Zehetner, Steven R. DeMeester*, Shahin Ayazi, Florian Augustin, Helen J. Sohn, John C. Lipham, Jeffrey A. Hagen, Tom R. DeMeester*
   Department of Surgery, Keck School of Medicine, University of Southern California, Los Angeles, CA
   DISCUSSANT: ROSS M. BREMNER

9:00 am – 9:10 am
INTRODUCTION OF NEW MEMBERS AND RESIDENT ESSAY FINALISTS, Hacienda Ballroom

9:10 am – 9:55 am
PRESIDENTIAL ADDRESS
Hacienda Ballroom
Introduced By: Robbin G. Cohen
“BIGGER”
J. Scott Millikan

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

10:20 am – 11:40 am
SCIENTIFIC SESSION II
Hacienda Ballroom
Moderators: Thomas A. Burdon
David A. Fullerton
(10 minutes presentation, 10 minutes discussion)
Learning objectives for this session are the same as those for Scientific Session I, on pages 21–22.

4. Lung Allocation Score Predicts Net Benefit from Lung Transplantation
   Mark J. Russo1, Kim Hong1, Alex Iribarne1, Annetine Gelijns2
   1Columbia University, New York, NY; 2Mount Sinai Medical Center, New York, NY
   DISCUSSANT: MICHAEL A. SMITH

5. Erythropoietin Attenuates Spinal Cord Ischemia Reperfusion Injury
   Phillip D. Smith, Ferenc Puskas, David A. Fullerton*, Xianzhong Meng, Doug Cho, Joseph C. Cleveland*, Michael J. Weyant*, Thomas B. Reece
   University of Colorado, Aurora, CO
   DISCUSSANT: JOHN S. IKONOMIDIS
6. Outcomes of CABG and Reduction Annuloplasty for Functional Ischemic MR: A Prospective Multicenter Study

Eugene A. Grossi1, Y. Joseph Woo2, Nirav Patel3, Judith D. Goldberg1, Charles F. Schwartz1, Valavanur A. Subramanian1, Christopher Genco3, Scott M. Goldman5, Marco A. Zenati6, J. Alan Wolfe7, Yugal K. Mishra8, Naresh Trehan9

1New York University School of Medicine, New York, NY; 2Hospital of the University of Pennsylvania, Philadelphia, PA; 3Lenox Hill Medical Center, New York, NY; 4Covenant Health Center, Saginaw, MI; 5Lankenau Hospital, Lancaster, PA; 6Veterans Administration Hospital, Pittsburgh, PA; 7St. Joseph’s Hospital, Atlanta, GA; 8Escorts Heart Institute and Research Centre, New Delhi, India; 9Indrapratha Apollo, New Delhi, India

DISCUSSANT: VINCE GUADIANI

7. Does Optimal Care Ensure Better Outcomes?

Robert J. Cerfolio, Ayesha S. Bryant
University of Alabama at Birmingham, Birmingham, AL

DISCUSSANT: JOHN R. HANDY

11:40 am – 12:30 pm CONTROVERSIES IN THORACIC SURGERY

Hacienda Ballroom

The Future of CT Practice Is an Employed Model

Moderator: Lawrence H. Cohn
Pro: Mark Hillard
Con: Vincent Gaudiani

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

• Comprehend the models that hospitals use to encourage employment by surgeons and understand the current trends across the country;
• Review the benefits of a traditional private practice and what elements of these may be threatened with future health care changes; and
• Understand the financial implications of each of these models and the changes that are likely to occur with health-care reform.

12:30 pm ADJOURN

12:45 pm – 5:00 pm THE RONALD REAGAN PRESIDENTIAL LIBRARY AND MUSEUM TOUR**, Transportation to Depart from the Front Entrance of Hotel

6:30 pm – 10:00 pm TASTE OF OJAI STREET FESTIVAL THEME DINNER
Herb Garden/Recreation Field

** Separate Subscription Required
FRIDAY, JUNE 25, 2010

6:00 am – 12:00 pm  REGISTRATION, Hacienda Foyer
6:00 am – 12:00 pm  SPEAKER READY ROOM, Hacienda Hallway
6:30 am – 7:50 am  SIMULTANEOUS BREAKFAST SESSIONS

A)  Adult Cardiac Session**, Hacienda Ballroom
   Blood Conservation in Adult Cardiac Surgery: How and Why
   James Brevig

At the conclusion of this session, participants will be able to:
• Consider the surgical risks of anemia compared to the risks of blood transfusion;
• Understand the institutional impact of blood utilization practices and strategies to support change; and
• Review strategies of a blood management program implemented in a community hospital to reduce transfusions while maintaining quality patient outcomes.

B)  General Thoracic Session**, Garden Room
   Rescue Therapies for Acute Pulmonary Failure
   Charles E. Hoopes

At the conclusion of this session, participants will be able to:
• Understand the new techniques available for pulmonary salvage for acute end-stage respiratory failure;
• Recognize which patients may benefit from ECMO or other techniques for pulmonary support; and
• Comprehend what is needed to institute the different techniques at their hospital.

7:00 am – 11:00 am  FAMILY HOSPITALITY, Oak Café
7:30 am – 8:00 am  CONTINENTAL BREAKFAST, Anacapa Ballroom
7:30 am – 12:00 pm  EXHIBITS, Anacapa Ballroom
7:55 am – 8:00 am  DAVID J. DUGAN AWARD PRESENTATION
   Hacienda Ballroom
   Conferred to John A. Hawkins, Salt Lake City, UT by Steven W. Guyton

C)  Congenital Heart Disease Session**, Libbey Boardroom
   Outcomes in Congenital Heart Surgery: What Do They Mean, What Should We Measure?
   Karl F. Welke

At the conclusion of this session, participants will be able to:
• Define outcomes research and describe the benefits of it as a tool in congenital heart surgery;
• Understand how to interpret the results and recognize the limitations of outcomes research studies in congenital heart surgery; and
• Learn what factors and variables should be taken into consideration when designing an outcomes research study.

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

• Become familiar with the emerging concept of the science of health care delivery;
• Understand the relationship of this concept to delivery system reform elements in the Patient Protection and Affordable Care Act of March 2010; and
• Discuss implications for physicians and other providers as payment is linked to process, outcomes, and cost data.

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

Hacienda Ballroom

Moderators: Gordon A. Cohen
Anthony P. Furnary

(10 minutes presentation, 10 minutes discussion)

Learning objectives for this session are the same as those for Scientific Session I, on pages 21-22.
11. Hypoglycemia with Intensive Insulin Therapy in Cardiac Surgery Patients: Predisposing Factors and Association with Mortality
Sotiris C. Stamou, Marcy Nussbaum, John D. Carew, Kelli Dunn, Robert M. Stiegel, Mark Reames, Eric Skipper, Francis Robicsek, Kevin W. Lobdell
Sanger Heart and Vascular Institute, Carolinas Medical Center, Charlotte, NC
DISCUSSANT: ANTHONY P. FURNARY

12. Survival after Resection of Truly Synchronous N2 Node Negative Non-Small Cell Lung Cancer
Thomas Fabian1, Ayesha S. Bryant1, John A. Federico1, Robert J. Cerfolio2
1Albany Medical College, Albany, NY; 2University of Alabama at Birmingham, Birmingham, AL
DISCUSSANT: STEVEN R. DEMEESTER

10:30 am – 11:00 am COFFEE BREAK, VISIT EXHIBITS & POSTERS
Anacapa Ballroom

11:00 am – 12:00 pm SCIENTIFIC SESSION IV
Hacienda Ballroom
Moderators: John J. Lamberti
Michael S. Mulligan
(10 minutes presentation, 10 minutes discussion)

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

+13. Improvement in Left Ventricular Morphology and Function After Mitral Valve Surgery: The Risk of Delaying Surgery
Cleveland Clinic, Cleveland, OH
DISCUSSANT: LUIS J. CASTRO

12:00 pm ADJOURN
1:00 pm GOLF TOURNAMENT**, George C. Thomas, Jr., Championship Golf Course
2:00 pm TENNIS TOURNAMENT**, Tennis Center
EVENING FREE

* Samson Resident Prize Essay

** Separate Subscription Required
CF3. Synchronized Epi-aortic 2-Dimensional and Color Doppler Echo Guidance Enables Routine Ascending Aorta Cannulation in Type A Acute Aortic Dissection
Yoshito Inoue1, Ryoichi Takahashi2, Toshihiko Ueda3, Ryosuke Yozu4
1Hiratsuka City Hospital, Hiratsuka, Kanagawa, Japan; 2Saiseikai Utsunomiya Hospital, Tochigi, Japan; 3Tokai University, Department of Cardiovascular Surgery, Isehara, Kanagawa, Japan; 4Keio University, School of Medicine, Tokyo, Japan

CF4. Preventing Cardiac Remodeling: The Combination of Cell-Based Therapy and Cardiac Support Therapy Preserves Left Ventricular Function in Rodent Model of Myocardial Ischemia
Suyog A. Mokashi, Jian Guan, Dahai Wang, Vakhtang Tchantchaleishvili, Mark Brigham, Stu Lipsitz, Lawrence Lee, Jan Schmitto, Lawrence H. Muhlbaier, Charles W. Stratton
1Vanderbilt University, Nashville, TN; 2Centennial Medical Center, Nashville, TN; 3Meharry Medical College, Nashville, TN; 4Duke University, Durham, NC

CF5. Spliced SDF-1α Analog Stimulates Endothelial Progenitor Cell Migration and Improves Cardiac Function in a Dose-Dependent Manner Following Myocardial Infarction
William Hiesinger1, John R. Frederick1, J. Raymond Fitzpatrick, III1, Pavan Atluri1, Rebecca D. Levit1, Ryan C. McCormick1, Nicole A. Marotta1, Jeffrey R. Muenzer1, Ah-Young Kim1, Y. Joseph Woo1
1University of Pennsylvania, Philadelphia, PA; 2Emory University, Atlanta, GA

CF6. Stenotic Aortic Valves Have Dysfunctional Mechanisms of Anti-Inflammation: Implications for Aortic Stenosis
Joon H. Lee, Xianzhong Meng, Michael J. Weyant*, T. Brett Reece, Joseph C. Cleveland, David A. Fullerton*
1University of Colorado Health Science Center, Aurora, CO

* WTSA Member
CF7. Cardiac Retransplantation: A Viable Option
Hannah Zimmerman, Romana Coelho-Anderson, Nicole Mineburg, Michael McCarthy, Jack G. Copeland, III*
University of Arizona, Tucson, AZ

CF8. Reproducibility of Left Atrial Ablation with High Intensity Focused Ultrasound in a Calf Model
Nestor Villamizar1, Jennifer Crow2, Valentino Pacentino, III1, Louis DiBernardo1, Mani Daneshmand1, Mark Groh1, Carmelo Milano1
1Department of Surgery, Duke University, Durham, NC; 2Department of Pathology, Duke University, Durham, NC; 3Mission Saint Joseph Hospital, Asheville, NC

CF8. Simulation-Based Learning in Mitral Valve Surgery
David L. Joyce1, Tanvir S. Dhillon2, Anthony D. Caffarelli1, Daniel D. Joyce1, Dimitrios N. Tsirigotis1, Thomas A. Burdon1**, James I. Fann1**
1Stanford University, Palo Alto, CA; 2University of California, San Diego, San Diego, CA; 3New York University, New York, NY; 4Yale University School of Medicine, New Haven, CT

Patrick L. Wagner1, James Huang1, Robert J. Downey1, Nabil Rizk1, Bernard Park1, Raja M. Flores1, Valerie W. Rusch1
1New York-Presbyterian Hospital, New York, NY; 2Memorial Sloan-Kettering Cancer Center, New York, NY

CF10. Surgical Treatment of Non-Invasive or Microinvasive Lung Adenocarcinoma: Limited Lung Resection Versus Lobectomy?
Hyonah Kim, Charles A. Powell, Alain C. Borczuk, Mark E. Ginsburg, Lyall Gorenstein, Jhoshua R. Sonett
Columbia-Presbyterian, New York, NY

CF11. Immunosuppression Induced Bronchial Epithelial to Mesenchymal Transition: A Potential Contributor to Obliterative Bronchiolitis
Valerie M. Felton, Brigham C. Willis, Michael A. Smith*, Ross M. Brenner*
St. Joseph’s Hospital and Medical Center, Phoenix, AZ

Samantha J. Davis1, Lili Zhao2, Mark B. Orringer1, Andrew C. Chang1
1University of Michigan Medical School, Ann Arbor, MI; 2University of Michigan Cancer Center, Ann Arbor, MI

MadhanKumar Kuppusamy, Julie Sylvester, Donald E. Low*
Virginia Mason Medical Center, Seattle, WA

Mark F. Berry1, B. Zane Atkins2, Betty C. Tong1, David H. Harpole1, Thomas A. D’Amico1, Mark W. Onaitis1
1Duke University, Durham, NC; 2Durham Veteran Affairs Medical Center, Durham, NC
CF15. Correlation of Clinical Outcomes with Expression of ERCC1 and Other Chemotherapy-Resistance Genes in Mediastinal Lymph Nodes from Patients With Stage IIIA NSCLC
Hasmeena Kathuria, Karin A. Sloan, Carl J. O’Hara, Michael Ebright, Christine C. Reardon, Anne Hinds, Benedict D. Daly
Boston Medical Center, Boston, MA

CF16. Impact of Neoadjuvant Chemo-Radiotherapy Therapy Followed by Surgical Resection on Node Negative T3 and T4 Non-Small Cell Lung Cancer (NSCLC)
Benedict D.T. Daly, Michael I. Ebright, Hiran C. Fernando, Ken S. Zaner, Donna M. Morelli, Lisa A. Kachnic
Boston Medical Center, Boston, MA

CF17. Older Children at Time of First Stage Palliation of Complex Univentricular Cardiac Anomalies Have Ongoing Mortality Vulnerability that Continues After the Cavopulmonary Connection
Bahaaldin Alsoufi, Mamdouh Al-Ahmadi, Cedric Manlihot, Zohair Al-Halees, Brian McCrindle, Ahmad Moussa, Yasser Al-heraish, Avedis Kalloghlian, Charles Canver
1King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia; 2Hospital for Sick Children, Toronto, ON, Canada

CF18. Biventricular Repair for Ebstein’s Anomaly in Neonates and Infants: A 15-Year Follow-Up
Christopher J. Knott-Craig, Steven P. Goldberg, Umar S. Boston, Kent E. Ward, Edward D. Overholt, Robert I. Romp, Thomas K. Chin, Thomas Spentzas
1University of Tennessee/Le Bonheur Children’s Medical Center, Memphis, TN; 2University of Oklahoma Children’s Hospital, Oklahoma City, OK; 3University of Alabama at Birmingham, Birmingham, AL

CF19. Fontan Surgery in Patients with an Interrupted IVC: Guidelines for Optimizing the Hepatic Baffle Design
Diane A. de Zelicourt, Christopher M. Haggerty, Kartik S. Sundareswaran, Brian S. Whited, Jarek R. Rossignac, Mark A. Fogel, Kirk R. Kanter
1Georgia Institute of Technology, Atlanta, GA; 2Children’s Hospital of Philadelphia, Philadelphia, PA; 3Emory University School of Medicine, Atlanta, GA

CF20. Direct Optical Measurement of Intra-Operative Myocardial Oxygenation During Congenital Heart Surgery
1University of Washington, Seattle, WA; 2Seattle Children’s Hospital, Seattle, WA

CF21. Contemporary Outcomes of Surgical VSD Closure
Brett R. Anderson, Kristen N. Stevens, Susan C. Nicolson, Stephen B. Gruber, Thomas L. Spray, Gil Wernovsky, Peter J. Gruber
1Children’s Hospital of Philadelphia, Philadelphia, PA; 2University of Michigan, Ann Arbor, MI

* WTSA Member
CF22. Near Complete Elimination of Surgical Site Infections Following Pediatric Cardiac Surgery Using Quality Improvement Methodology
Megan Miller, Traci Ashcraft, Peter Manning, Pirooz Eghtesady
Cincinnati Children’s Hospital Medical Center, Cincinnati, OH

CF23. Stage II Palliation for Hypoplastic Left Heart Syndrome without Cardiopulmonary Bypass
Anthony Azakie*, Natalie C. Johnson1, Petros V. Anagnostopoulos1, Mohammed S. Akram2, Anil Sapru1
1University of California San Francisco, San Francisco, CA; 2Drexel University, Philadelphia, PA

CF24. Strategies and Long-Term Outcomes of Biventricular Repair in Double Outlet Right Ventricle with Non-Committed Ventricular Septal Defect
Shengshou Hu, Yan Li, Shoujun Li, Zhongdong Hua, Xu Wang, Keming Yang, Qiang Meng, Peng Li, Yongqing Li
National Heart Center and Fuwai Hospital, Beijing, China

*WTSA Member
10:10 am – 11:10 am  **SCIENTIFIC SESSION VI**

**Hacienda Ballroom**

Moderators: Donald E. Low
John C. Chen

(10 minutes presentation, 10 minutes discussion)

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

**20. Simulating VATS Lobectomy: A Virtual Reality Cognitive Task Trainer**
New York University School of Medicine, New York, NY

**DISCUSSANT: RICHARD I. WHYTE**

**21. Is Off Pump Coronary Artery Bypass Grafting Superior to Conventional Bypass in Octogenarians?**
Damien J. LaPar¹, Castigliano M. Bhamidipati¹, T. Brett Reece¹, Joseph C. Cleveland²*, Irving L. Kron¹, Gorav Ailawadi¹
¹University of Virginia, Charlottesville, VA; ²University of Colorado, Aurora, CO

**DISCUSSANT: JAMES I. FANN**

**22. Perioperative Statin Therapy Reduces Mortality in Normolipidemic Patients Undergoing Cardiac Surgery**
Bluhm Cardiovascular Institute, Division of Cardiothoracic Surgery at Northwestern University Feinberg School of Medicine and Northwestern Memorial Hospital, Chicago, IL

**DISCUSSANT: DAVID A. FULLERTON**
**OBJECTIVES:** Previous studies have established that patients undergoing valvular heart surgery with a history of atrial fibrillation (AF) have worse long-term prognoses compared to patients without AF. It is not clear if surgical correction of AF attenuates this increased risk of mortality. Thus, we sought to compare the long-term survival of patients with treated AF to patients without a history of AF.

* WTSA Member
18 [4.8%], \( P = 0.26 \)) and total length of stay (10.1 ± 10 vs. 10.9 ± 12 days, \( P = 0.31 \)) compared to patients without AF. Subset analysis confirmed that survival was not different between the two groups in patients undergoing isolated AVR (\( P = 0.66 \)), isolated MVR (\( P = 0.45 \)) and CABG-Valve (\( P = 0.20 \)).

CONCLUSIONS: Treating AF in patients undergoing valve surgery restores the expected survival to that of patients without preexisting AF, irrespective of the surgical procedure. Strong consideration should be given to the treatment of AF in this population.
CONCLUSION: The population undergoing CHS has increased over time. The palliative nature of CHS and its decreased mortality results in a population that has increased in age, resulting in the emergence of adolescents and young adults as the dominant cohort requiring CHS. The success of surgical treatment in children with congenital heart disease will continue to shift the patient population undergoing CHS towards adulthood, a paradigm shift for which we must prepare.

BACKGROUND: Esophagectomy is the traditional therapy for high-grade dysplasia (HGD) and intramucosal cancer (IMC). New endoscopic therapies (endoscopic resection and mucosal ablation) allow treatment of these lesions with esophageal preservation. The aim of this study was to compare outcome of endoscopic therapy with esophagectomy for HGD and IMC.

METHODS: A retrospective review was performed of patients treated for HGD or IMC from 2000 to 2009.

RESULTS: Endoscopic therapy was performed in 35 patients (HGD = 20, IMC = 15) and esophagectomy in 80 patients (HGD = 19, IMC = 61). Groups were similar regarding age, gender and prevalence of co-morbidities. Endoscopic therapy had a median of 2 interventions per patient. They included 80 endoscopic resections and 36 mucosal ablations. HGD and IMC were eliminated in 21 patients, 3 required esophagectomy for persistent multifocal HGD and 11 are still undergoing further endoscopic therapy. A laparoscopic Nissen fundoplication was performed in 7 patients after endoscopic therapy to prevent continued reflux. Morbidity was significantly lower after endoscopic therapy than resection (6% vs. 51%, p < 0.0001) and there was only one mortality which occurred in the esophagectomy group. There was no recurrence of dysplasia or cancer in the 21 patients who had complete elimination of HGD or IMC. Median follow-up was shorter after endoscopic therapy (15 vs. 34 months, p = 0.0011). There was no difference in overall survival (94% at 3 years in both groups). One patient died from systemic disease at 50 months after esophagectomy. No cancer deaths occurred after endoscopic therapy.
CONCLUSIONS: Endoscopic therapy is an effective treatment for HGD and IMC. It is associated with lower morbidity than esophagectomy and allows preservation of the esophagus with the option to add a fundoplication to control reflux.
OBJECTIVES: The lung allocation score (LAS) was initiated in May 2005 to allocate lungs based on medical urgency and post-transplant survival. However, the relationship between LAS and candidate outcome remains poorly characterized. The purpose of this study was (1) to describe outcomes by LAS at the time of listing and (2) to estimate the net survival benefit of transplantation.

METHODS: UNOS provided de-identified patient-level data. Analysis included lung transplant candidates aged 12 yo and older and listed between 4/5/06–12/31/08 (n = 6,080). Candidates were stratified according to LAS at the time of listing into 7 groups: LAS 0–40 (n = 4,283, 70.45%), 40–49 (n = 1,100, 18.1%), 50–59 (n = 271, 4.46%), 60–69 (n = 123, 2.02%), 70–79 (n = 87, 1.43%), 80–89 (n = 133, 2.19%), and 90+ (n = 83, 1.37%). Outcomes of interest included death on the waiting list at 90 days and transplantation at 90 days. The net survival benefit of transplantation was defined as expected actuarial post-transplant graft survival minus expected actuarial survival on the waiting list—where the outcome of interest was death on the waiting list; candidates were censored at the time of transplant or last follow-up on the waiting list.

RESULTS: Figure 1 summarizes outcomes on the waiting list by LAS strata. In the low-risk strata (e.g., 0–40, 40–49), less than 3% of candidates died on the waiting list within 90 days of listing. Conversely, 38% of candidates in the high-risk strata (e.g., 80–89 and 90+) died waiting within 90 days. The net survival benefit was lowest in the LAS 0–40 (0.3 years), LAS 80–89 (2.21 years), and LAS 90+ group (1.31 years) and highest in the 50–59 (2.80 years), 60–69 (2.87 years), 70–79 (2.93 years) groups.

CONCLUSIONS: The mid-risk groups (e.g., 30–39, 60–69, 70–79) achieve the greatest survival benefit from transplantation. During the first 90 days after listing, given the low likelihood of death in the low-risk strata (e.g., 0–40 and 40–49), survival benefit is less than other groups. Conversely, though high-risk strata (e.g., 80–89 and 90+) had the highest likelihood of mortality on the waitlist, they had poor post-transplant survival and therefore low net survival benefit of transplantation.
**+5. Erythropoietin Attenuates Spinal Cord Ischemia Reperfusion Injury**

**Phillip D. Smith, Ferenc Puskas, David A. Fullerton*, Xianzhong Meng, Doug Cho, Joseph C. Cleveland*, Michael J. Weyant*, Thomas B. Reece**

*University of Colorado, Aurora, CO*

**DISCUSSANT: JOHN S. IKONOMIDIS**

**BACKGROUND:** Paraplegia remains a significant risk for patients undergoing thoracic and thoracoabdominal aortic procedures. While surgical adjuncts exist to minimize this spinal cord ischemia and reperfusion (IR) injury, no pharmacologic therapies have proven efficacious in the avoidance of this pathology. Erythropoietin has been shown to attenuate IR injury in the brain and even traumatic injury to the spinal cord. However, the effects of erythropoietin in spinal cord IR injury have not yet been elucidated. We hypothesized that pretreatment with erythropoietin would attenuate the functional and cytoarchitectural spinal cord injury related to high-risk aortic procedures.

**METHODS:** Adult male C57Bl/6 mice were subjected to IR. Through a neck incision, the arch of the aorta and proximal left subclavian artery were clamped for 5 minutes. The animals were followed for 48 hours. Functional scores of hind limb function were assessed every 12 hours using the Basso motor score. Experimental groups consisted of treatment with erythropoietin 4 hours prior to cross-clamping (n = 7), ischemic controls (n = 1), and sham (n = 6). Lumbar sections of the spinal cord were harvested after 48 hours and preserved for cytoarchitectural analysis.

**RESULTS:** Mice treated with erythropoietin prior to ischemia exhibited significant preservation of hind limb motor function after aortic cross clamping and reperfusion. All mice without pretreatment were paralyzed at 48 hours after IR. All mice with erythropoietin pretreatment had improved motor function and three mice had no measurable neurologic deficit at 48 hours. Histological analysis in mice treated with erythropoietin showed markedly reduced neuronal cell injury.

**CONCLUSIONS:** Erythropoietin preserves both function and histology in mice undergoing spinal cord ischemia and reperfusion. Although the mechanism of protection remains unknown at this point, the injury attenuation by erythropoietin in this model is significant. With further elucidation of both the mechanism of protection and the optimal administration, erythropoietin could be an important adjunct in reducing the incidence and severity of spinal cord injury related to aortic interventions.

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**Figure 1:** Functional outcomes with and without erythropoietin pre-treatment (*indicates p < 0.05 between untreated and treated ischemia trials).
6. Outcomes of CABG and Reduction Annuloplasty for Functional Ischemic MR: A Prospective Multicenter Study

Eugene A. Grossi1, Y. Joseph Woo2, Nirav Patel3, Judith D. Goldberg1, Charles F. Schwartz1, Valavanur A. Subramanian1, Christopher Genco4, Scott M. Goldman5, Marco A. Zenati6, J. Alan Wolfe7, Yugal K. Mishra8, Naresh Trehan9
1New York University School of Medicine, New York, NY; 2Hospital of the University of Pennsylvania, Philadelphia, PA; 3Lenox Hill Medical Center, New York, NY; 4Covenant Health Center, Saginaw, MI; 5Lankenau Hospital, Lancaster, PA; 6Veterans Administration Hospital, Pittsburgh, PA; 7St. Joseph’s Hospital, Atlanta, GA; 8Escorts Heart Institute and Research Centre, New Delhi India; 9Indrapratha Apollo, New Delhi, India

DISCUSSANT: VINCE GUADIANI

BACKGROUND: Functional Ischemic mitral regurgitation (FIMR) is a frequent end-stage complication of coronary artery disease due to ventricular remodeling and ensuing valvular dysfunction. The gold standard therapy for FIMR is reduction annuloplasty (RA) and CABG where appropriate. Unfortunately, outcome data are retrospective, limited to individual series, and somewhat contradictory. This report details a prospective, multicenter, independently monitored, study which documents the outcomes of RA for FIMR using core lab reviewed data.

METHODS: 21 centers randomized 75 patients to a CABG plus RA subgroup as the control arm of the RESTORMV trial. This FDA approved, investigational device trial (Clinical Trials ID = NCT00120276) compared CABG plus ventricular reshaping (Coapsys) to CABG+RA; the primary, comparative outcomes have been reported previously. Patients were 65.8 years old and predominately male (86.3%). Entry criteria included patients requiring revascularization and having severe FIMR (or symptomatic moderate FIMR); ejection fraction ≥25%; LVED ≤7.0 cm, and >30 days since acute transmural myocardial infarction. All echocardiograms were independently scored by a core lab. Reduction annuloplasty was achieved by band or ring annuloplasty. Two patients underwent immediate conversion to chordal sparing MV replacement for inability to correct MR with RA and the as-treated results are presented. Mean and standard deviations are reported and repeated measures ANOVA and Cox regression analyses were performed.

RESULTS: Mortality at 30 days was 4.1% (3/73). Patients received an average 2.8 bypass grafts. Mean follow-up was 24.6 months. Data table is below. Multiple variable analysis revealed that age (p = .001; hazard ratio (HR) 1.16, 95% CI 1.06–1.26) and renal disease (p = .018; HR = 3.48, 95% CI 1.25–9.72) were associated with decreased survival and that renal disease (p = .007; HR = 3.8, 95% CI 1.5–10.0), age (p = .053; HR = 1.1, 95% CI 0.9–1.1), and LVEF Vol Index (p = .091, HR = 1.02, 95% CI 0.99–1.04) were associated with decreased freedom from death, reoperation, or recurrent MR.

CONCLUSIONS: CABG with reduction annuloplasty for FIMR predictably reduces MR and relieves symptoms. This operative strategy for the treatment of moderate to severe MR is associated with improved indices of ventricular geometry, improved NYHA functional Class and excellent freedom from recurrent mitral insufficiency. While long-term prognosis remains guarded, this multicenter study delineates the intermediate-term benefits to such an approach.

<table>
<thead>
<tr>
<th>Patient Outcomes</th>
<th>Preop (n = 73)</th>
<th>1 Yr (n = 56)</th>
<th>2 Yr (n = 37)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative Survival</td>
<td>NA</td>
<td>81% ± 5%</td>
<td>78% ± 5%</td>
</tr>
<tr>
<td>Freedom from death or valve reoperation</td>
<td>NA</td>
<td>81% ± 5%</td>
<td>78% ± 5%</td>
</tr>
<tr>
<td>Freedom from death, valve reoperation or MR ≥2</td>
<td>NA</td>
<td>70% ± 5%</td>
<td>68% ± 5%</td>
</tr>
<tr>
<td>EF</td>
<td>37.9 ± 11.7</td>
<td>47.0 ± 12.5**</td>
<td>47.0 ± 12.9**</td>
</tr>
<tr>
<td>LVED (cm)</td>
<td>5.8 ± 0.7</td>
<td>5.3 ± 0.9</td>
<td>5.2 ± 0.7**</td>
</tr>
<tr>
<td>LVES Vol Index (mL/m²)</td>
<td>56.8 ± 24.2</td>
<td>47.8 ± 26.5</td>
<td>45.8 ± 22.9</td>
</tr>
<tr>
<td>MR (0 = none, 1 = mild, 2 = moderate, 3 = moderate/severe, 4 = severe)</td>
<td>2.6 ± 0.8</td>
<td>0.5 ± 0.7*</td>
<td>0.3 ± 0.6*</td>
</tr>
<tr>
<td>NYHA Class</td>
<td>2.4 ± 0.6</td>
<td>1.5 ± 0.6*</td>
<td>1.4 ± 0.6*</td>
</tr>
</tbody>
</table>

Compared to baseline * <0.001, **0.01, §0.05
7. Does Optimal Care Ensure Better Outcomes?
Robert J. Cerfolio, Ayesha S. Bryant
University of Alabama at Birmingham, Birmingham, AL

DISCUSSANT: JOHN R. HANDY

BACKGROUND: Several insurers have considered using “pay for performance” as a means for reimbursement yet there is little data that better outcomes are from providing better or optimal care.

METHODS: We strived to provide “the optimal management for all patients with non-small cell lung cancer” by mandating several specific pre, intra, and post-operative benchmarks (shown in Table 1). We then assessed our ability to deliver these benchmarks and the outcomes of patients who received them compared to those who did not. Some benchmarks were labelled as “critical.”

Table 1: Benchmarks (**denotes critical benchmark)

<table>
<thead>
<tr>
<th>PRE-OPERATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. See patient in clinic within 2 weeks of patient calling or referral physician calling for appointment</td>
</tr>
<tr>
<td>2. Integrated PET/CT within 30 days of surgical resection</td>
</tr>
<tr>
<td>3. Contrasted CT scans with 5 mm colubmated cuts within 30 days of surgery</td>
</tr>
<tr>
<td>4. Have a board certified general and cardiothoracic surgeon who performs only general thoracic surgery see and evaluate patient</td>
</tr>
<tr>
<td>5. Surgery and/or definitive staging procedures offered with 3 weeks of the surgeon (if patient’s schedule allows and he/she is physically fit)</td>
</tr>
<tr>
<td>6. If tumor &gt;4 cm, central, and/or has a maxSUV of 9 or greater, mediastinal staging procedures such as EUS-FNA and/or EBUS performed with rapid on site cytology and/or mediastinoscopy performed</td>
</tr>
<tr>
<td>7. If maxSUV of lymph node is &gt;50% of primary tumor, bx of that node is performed (unless it is an isolated #3 or #6 lymph node in selected patients)</td>
</tr>
<tr>
<td>8. Anesthesia to evaluate patient on same day of clinic appointment</td>
</tr>
<tr>
<td>9. Stress test performed for patients with a pack year history of greater than 20 years or patient with history of coronary artery disease</td>
</tr>
<tr>
<td>10. Cardiology clearance in any patient with abnormal stress test</td>
</tr>
<tr>
<td>11. Full set of pulmonary function tests including FEV1%, DLCO% and DLCO/VA% within 30 days of surgery</td>
</tr>
<tr>
<td>12. Smoking cessation classes and/or prescription and pamphlets given at least two weeks prior to surgery</td>
</tr>
<tr>
<td>13. ** Cardio-pulmonary rehab program at home prior to surgery for selected patients</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTRA-OPERATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. Patients who are younger than 70 years of age get epidural, &gt;70 years get pain pump</td>
</tr>
<tr>
<td>24. Anesthesia given by board certified anesthesiologist</td>
</tr>
<tr>
<td>25. Attending makes skin incision, and present for opening, for dissection of and ligation of all major vessels, and for LN removal and is present for chest closure up to the skin</td>
</tr>
<tr>
<td>26. Family called when incision is made</td>
</tr>
<tr>
<td>27. All patient have a VATS and/or a rib sparing, muscle sparing, nerve sparing thoracotomy</td>
</tr>
<tr>
<td>28. If thoracotomy is performed palpation of all non-resected lobes of the ipsilateral lung</td>
</tr>
<tr>
<td>29. Complete thoracic lymphadenectomy performed for patients with lung cancer—on the right side—resection of all of the 2R, 4R, 7, 8 and 9 and on the left side resection of the 4L, 5, 6, 7, 8L, 9L and removal of all appropriate N1 nodes</td>
</tr>
<tr>
<td>30. Lobectomy performed for all patients except those with BAC, those with a primary tumor greater than 2 cm or selected patients with low DLCO% or FEV1%</td>
</tr>
<tr>
<td>31. Negative bronchial margin, verified in the OR by frozen section</td>
</tr>
<tr>
<td>32. Negative stapled margins verified in the OR by frozen section, i.e., an R0 resection</td>
</tr>
<tr>
<td>33. One chest tube used for lobectomy, unless clinically scenario documented why two were used</td>
</tr>
<tr>
<td>34. Chest tube placed to wall suction on the day of surgery, to water seal next morning</td>
</tr>
<tr>
<td>35. ** Lobectomy performed under 1 hour and 40 minutes, skin to skin in patients who have not had: neoadjuvant chemotherapy, radiation or prior ipsilateral thoractomy. and under 2.5 hours in those patients who have had it</td>
</tr>
<tr>
<td>36. Skin incision time prior to 14:00</td>
</tr>
<tr>
<td>37. ** No RBCs transfused required or given in the operating room</td>
</tr>
<tr>
<td>38. ** Blood loss &lt;125 during operation</td>
</tr>
<tr>
<td>39. Needle and sponge count prior to leaving the operating room</td>
</tr>
</tbody>
</table>
RESULTS: Between 1/2007 and 12/2009, 778 patients with non-small cell lung cancer underwent elective thoracotomy with intent to cure by one general thoracic surgeon after careful staging. Overall only 498 (64%) patients had all of the benchmarks delivered and their operative morbidity and mortality were 26% and 2.1%, respectively. In the remaining 280 patients, operative morbidity and mortality was no different (29% and 2.7%). Intra-op benchmarks were the easiest to deliver (94% of patients). However, when critical benchmarks (as denoted in the Table) were not delivered patients had a worse outcome (morbidity 23% vs. 27%, p = 0.002 and mortality was 1.8% vs. 4.7%, p < 0.001). Patient risk factors (age, gender, poor PFTs, smoking history, coronary artery disease, renal dysfunction and diabetes) however were a better predictor of worse outcome then the lack of the delivery of critical benchmarks.

CONCLUSION: Although the identification of specific benchmarks or “critical aspects” of patient care is subjective some seem to relate to improved outcomes. Most can be consistently delivered. However, better outcomes may be secondary to social-economic and health characteristics of the patient as opposed to the quality of the provider. Intra-op benchmarks are the easiest to deliver but these do NOT equal to improved results. Although further, multi-institutional studies are needed these data suggest that the concept of “pay for performance” may be based more on the “quality of the patient” as opposed to the quality of healthcare providers, even AFTER risk stratification is performed.

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**Table 1: Benchmarks (**denotes critical benchmark)**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>Have a CXR in recovery room</td>
</tr>
<tr>
<td>41 **</td>
<td>Avoid going to the intensive care unit</td>
</tr>
<tr>
<td>42 **</td>
<td>Go directly to a specialized floor with nurses experienced in caring for patients who have had a pulmonary resection</td>
</tr>
<tr>
<td>43</td>
<td>Pain service involved in their post-op care</td>
</tr>
<tr>
<td>44</td>
<td>Respiratory therapists at bedside at least two times per day</td>
</tr>
<tr>
<td>45</td>
<td>CXR ordered only as needed</td>
</tr>
<tr>
<td>46</td>
<td>PA/Lat after last CT removal</td>
</tr>
<tr>
<td>47 **</td>
<td>Discharge by postoperative 4 or sooner, unless social issues delay DC</td>
</tr>
<tr>
<td>48</td>
<td>Cardiology consult if atrial arrhythmias that last greater than 24 hrs</td>
</tr>
<tr>
<td>49</td>
<td>Follow-up in clinic 3 weeks post op</td>
</tr>
<tr>
<td>50</td>
<td>Pain medicines prior to discharge</td>
</tr>
<tr>
<td>51</td>
<td>Patients sent home with a telephone number that ensures they can contact a thoracic team member 24 hrs a day, 7 days a week</td>
</tr>
<tr>
<td>52 **</td>
<td>Path report available by POD 3 prior to discharge and if not patient instructed to call office for results after discharge</td>
</tr>
<tr>
<td>53 **</td>
<td>An oncologist appointment within 3 weeks if post-operative adjuvant therapy indicated</td>
</tr>
</tbody>
</table>

---

**Post-Operative**

- 40. Have a CXR in recovery room
- 41. **Avoid going to the intensive care unit**
- 42. **Go directly to a specialized floor with nurses experienced in caring for patients who have had a pulmonary resection**
- 43. Pain service involved in their post-op care
- 44. Respiratory therapists at bedside at least two times per day
- 45. CXR ordered only as needed
- 46. PA/Lat after last CT removal
- 47. **Discharge by postoperative 4 or sooner, unless social issues delay DC**
- 48. Cardiology consult if atrial arrhythmias that last greater than 24 hrs
- 49. Follow-up in clinic 3 weeks post op
- 50. Pain medicines prior to discharge
- 51. Patients sent home with a telephone number that ensures they can contact a thoracic team member 24 hrs a day, 7 days a week
- 52. **Path report available by POD 3 prior to discharge and if not patient instructed to call office for results after discharge**
- 53. **An oncologist appointment within 3 weeks if post-operative adjuvant therapy indicated**
**Friday, June 25, 2010**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 am – 12:00 pm</td>
<td><strong>Registration</strong>, Hacienda Foyer</td>
</tr>
<tr>
<td>6:00 am – 12:00 pm</td>
<td><strong>Speaker Ready Room</strong>, Hacienda Hallway</td>
</tr>
<tr>
<td>6:30 am – 7:50 am</td>
<td><strong>Simultaneous Breakfast Sessions</strong></td>
</tr>
<tr>
<td></td>
<td>A) Adult Cardiac Session**, Hacienda Ballroom</td>
</tr>
<tr>
<td></td>
<td>Blood Conservation in Adult Cardiac Surgery: How and Why</td>
</tr>
<tr>
<td></td>
<td>James Brevig</td>
</tr>
<tr>
<td></td>
<td>B) General Thoracic Session**, Garden Room</td>
</tr>
<tr>
<td></td>
<td>Rescue Therapies for Acute Pulmonary Failure</td>
</tr>
<tr>
<td></td>
<td>Charles E. Hoopes</td>
</tr>
<tr>
<td></td>
<td>C) Congenital Heart Disease Session**, Libbey Boardroom</td>
</tr>
<tr>
<td></td>
<td>Outcomes in Congenital Heart Surgery: What Do They Mean, What Should We Measure?</td>
</tr>
<tr>
<td></td>
<td>Karl F. Welke</td>
</tr>
<tr>
<td>7:00 am – 11:00 am</td>
<td><strong>Family Hospitality</strong>, Oak Café</td>
</tr>
<tr>
<td>7:30 am – 12:00 pm</td>
<td><strong>Exhibits</strong>, Anacapa Ballroom</td>
</tr>
<tr>
<td>7:55 am – 8:00 am</td>
<td><strong>David J. Dugan Award Presentation</strong></td>
</tr>
<tr>
<td></td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td></td>
<td>Conferred to John A. Hawkins, Salt Lake City, UT</td>
</tr>
<tr>
<td></td>
<td>by Steven W. Guyton</td>
</tr>
</tbody>
</table>

**Separate Subscription Required**
BACKGROUND: Endocarditis surgery carries the highest mortality of any valve disease, but risk factors and optimal patient selection are poorly understood due to a lack of large scale analyses. Accordingly, the Society of Thoracic Surgeons database was examined: 1) to perform an improved risk factor analysis, 2) to develop a simple risk scoring system, and 3) to define areas for future quality improvement.

METHODS: From 2002 through 2008, 19,730 valve procedures were performed for endocarditis in North America. Mitral procedures comprised 33.5%, aortic 29.4%, multiple valves 16.4%, and tricuspid 5.8%. Logistic regression analysis related baseline patient characteristics to a composite of mortality and morbidity: operative death, sternal infection, stroke, prolonged ventilation, pneumonia, renal failure, dialysis, multisystem organ failure, and readmission within 30 days. Points were assigned to each risk factor by rounding regression coefficients to integers, and estimated risk was obtained by averaging events for all patients having the same number of points.

RESULTS: Overall unadjusted mortality was 8.2%, and complications occurred in 53%: prolonged ventilation (27.9%), reoperation (14.9%), neurological events (8.4%), new renal failure (6%), new dialysis (4%), and multiple organ failure (3.3%). Significant preoperative risk factors (all \( p < 0.001 \)) and effect estimates [odds ratios; points] were: emergent, salvage status, or cardiogenic shock [3, 11, 17], preoperative isotropic or balloon pump support [2, 29, 12], preoperative hemodialysis, renal failure, or creatinine >2.0 [2, 16, 12], insulin dependent diabetes [1, 62, 7], multiple valve involvement [1, 58, 7], active vs “treated” endocarditis [1, 58, 7], urgent status without cardiogenic shock [1, 30, 6], NYHA class IV heart failure [1, 48, 6], preoperative arrhythmia [1, 39, 5], prior CABG [1, 38, 5], previous valve surgery [1, 38, 5], female gender [1, 36, 5], age >60 years [1, 30, 4], and BSA > 1.9 [1, 01, 1] with a C statistic of 0.728. A graph of observed and estimated events versus total points is shown in the Figure. With this simple preoperative risk scoring system, for example, a patient with a preoperative score of greater than 30 points would be predicted to have an over 50% risk of mortality or major morbidity after surgery. Interestingly, risk-adjusted mortality has not improved in recent years, with operative mortality for 2008 having increased relative to previous years (\( p < 0.04 \)). In the entire data set, mortality was better if “any valve” was repaired (OR = 0.72, \( p < 0.0001 \)).

CONCLUSIONS: Results after endocarditis surgery are greatly dependent on a variety of preoperative risk factors, and outcomes have worsened in the most recent year. Innovations in care are needed, and increasing valve repair and/or conversion of more patients to “treated” status are possible candidates. The proposed risk scoring system could greatly facilitate optimal patient selection, risk stratification, and communication with patients and other care providers. Because the presence of endocarditis influences valve surgery outcomes so significantly, endocarditis incidence and characteristics should be documented more clearly in future quality assessments.
Should We Resect Asymptomatic, Enlarged Thymus Glands?

Smit Singla, Leslie A. Litzy, Larry R. Kaiser, Joseph B. Shrager

1Department of Surgery, University of Pennsylvania School of Medicine, Philadelphia, PA; 2Department of Pathology and Laboratory Medicine, University of Pennsylvania School of Medicine, Philadelphia, PA; 3The University of Texas, Houston, TX; 4Division of Thoracic Surgery, Department of Cardiothoracic Surgery, Stanford School of Medicine and VA Palo Alto Healthcare System, Stanford, CA

DISCUSSANT: MICHAEL J. WEYANT

BACKGROUND: Patients frequently present to thoracic surgeons with an “enlarged thymus” incidentally identified on cross-sectional imaging. We sought to determine if thymectomy is appropriate in patients with these diffusely enlarged glands (DETs).

METHODS: Retrospective review of experience with thymectomy in patients without Myasthenia Gravis (MG) at one institution over 15 years. Patients were contacted for up-to-date follow-up.

RESULTS: 117 thymectomies were performed for diagnoses other than MG. Of 109 patients (93%) with complete data, 36 presented with a gland judged by the surgeon to be diffusely enlarged, while 73 had a discrete mass. Nearly all patients with DETs underwent transcervical thymectomy; most with discrete masses underwent sternotomy. Of the 36 patients with a DET, 18/36 (50%) occurred in patients with no symptoms referable to the thymus; 18/36 (50%) were symptomatic. No patients (0/18; 0%) with an asymptomatic DET had an ultimate pathological diagnosis that would have been an indication for resection (8 normal ± benign cyst; 10 “hyperplasia” ± cyst). Of the symptomatic DETs, 4/18 (22.2%) were found to represent lymphoma, but none represented thymoma or other tumor requiring resection (p = 0.06; symptomatic versus asymptomatic). Of the 73 patients with a discrete mass, a slightly greater percentage (45/73; 61.6%) were symptomatic, and both the symptomatic and asymptomatic patients had a high rate of pathological diagnoses that represented a clear indication for resection (24/45 [53.3%] and 12/28 [42.8%] respectively, thymoma or other solid tumor). Of the 25/109 patients initially given a pathological diagnosis of thymic hyperplasia, on re-review of the pathology only 3/25 (12%) had true cellular hyperplasia. Interestingly, 2 (67%) of these 3 patients developed an autoimmune disorder on long-term follow-up. None of the other 22 patients with lesser degrees of “hyperplasia” developed subsequent autoimmune disease.

CONCLUSIONS: Asymptomatic patients with a diffusely enlarged thymus gland can be followed expectantly because they have a 0% incidence of significant thymic pathology. Symptomatic patients with DET may have lymphoma, so biopsy is most appropriate. Nearly half of patients with discrete thymic masses have tumors that should be resected, but more accurate non-invasive diagnostic techniques are required to better differentiate within this group among processes that should/should not be resected. The finding that autoimmune disorders develop in most patients with true thymic cellular hyperplasia suggests that a pathophysiological relationship may exist between these entities.
10. Bioprosthetic Pulmonary Valve Replacement: Contemporary Analysis of a Large Single Center Series

Matan Setton¹, P. Brian Smith², James Jaggers¹, Andrew J. Lodge¹

¹Duke University Medical Center, Durham, NC; ²Duke Clinical Research Institute and Department of Pediatrics, Duke University Medical Center, Durham, NC; ³Department of Pediatric Cardiothoracic Surgery, Duke University Medical Center, Durham, NC

DISCUSSANT: JOHN J. NIGRO

OBJECTIVES: Repair of congenital heart defects involving the right ventricular outflow tract may require pulmonary valve replacement (PVR) at the time of primary repair or reoperation. Stented bioprosthetic valves are probably the most durable substitute currently available for older children and adults. However, percutaneously placed stent mounted valves that can be implanted in the pulmonary position have recently been introduced. It is important to establish a standard by which to judge this new technology.

METHODS: We reviewed the outcome of all stented bioprosthetic PVRs at a single center from 1992 to 2008. Echocardiographic data was reviewed to evaluate valve performance. Patients and/or parent/guardian(s) were asked to complete a questionnaire (SF-10™ and/or SF-36v2® Health Survey) to measure quality of life after surgery. Data were compared using Wilcoxon rank sum and Fisher’s exact test. Time to death or reintervention was compared between valve types by Cox-regression controlling for age of patient at surgery (<15 vs. ≥15 years).

RESULTS: We identified 161 patients that underwent 170 PVRs. Patients received either a porcine (n = 73) or pericardial valve (n = 97). There was no significant difference between the groups with respect to median age at PVR or valve size, though median follow-up duration was longer in patients that received a pericardial valve (Table). There was statistically more moderate or severe pulmonic stenosis (PS) in the pericardial valve group and also a trend towards more pulmonic insufficiency (PI). There were 6 catheter interventions and 12 reoperations. Survival was similar between groups, but overall incidence of reintervention was higher in the pericardial valve group (Table). There was no statistical difference in the rate of death or reintervention at 5 and 10 years between the groups. Controlling for patient age at surgery, we observed no difference in the risk of death or reintervention, hazard ratio = 0.95 (95% CI; 0.33, 2.76) for porcine valves compared with pericardial valves. Post-operative quality of life for the entire cohort was comparable to the US general population among patient-respondents >14 years (n = 34), while children <18 years (n = 17) reported slightly lower physical health scores.

CONCLUSIONS: This is the largest series of stented bioprosthetic pulmonary valve replacements yet reported. Quality of life is very good in these patients. A large majority of patients are free from significant PS and PI at intermediate follow-up. At ten years most valves will require reintervention. The higher number of reinterventions in the pericardial valve group is likely related to duration of follow-up as there was no statistical difference in the rate of reintervention between groups.

Demographics and Results by Valve Type

<table>
<thead>
<tr>
<th></th>
<th>Porcine</th>
<th>Pericardial</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at PVR (years)</td>
<td>18.7 [11.9, 34.8]</td>
<td>15.9 [9.7, 35.9]</td>
<td>0.31</td>
</tr>
<tr>
<td>Size of valve (mm)</td>
<td>25 [25, 27]</td>
<td>25 [25, 27]</td>
<td>0.77</td>
</tr>
<tr>
<td>Follow-up duration (months)</td>
<td>24.3 [11.6, 37.3]</td>
<td>56.8 [42.2, 74.6]</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Pulmonic stenosis (moderate/severe)</td>
<td>5/60 (8.3%)</td>
<td>20/74 (27.0%)</td>
<td>0.007</td>
</tr>
<tr>
<td>Pulmonic insufficiency (moderate/severe)</td>
<td>8/60 (13.3%)</td>
<td>20/73 (27.4%)</td>
<td>0.06</td>
</tr>
<tr>
<td>Overall mortality</td>
<td>2/67 (3.0%)</td>
<td>2/81 (2.5%)</td>
<td>0.99</td>
</tr>
<tr>
<td>Overall reintervention</td>
<td>3/67 (4.5%)</td>
<td>15/83 (18.0%)</td>
<td>0.012</td>
</tr>
<tr>
<td>Death or reintervention at 5 years</td>
<td>4/16 (25%)</td>
<td>3/40 (7.5%)</td>
<td>0.09</td>
</tr>
<tr>
<td>Death or reintervention at 10 years</td>
<td>5/5 (100%)</td>
<td>16/18 (89%)</td>
<td>0.99</td>
</tr>
</tbody>
</table>
11. Hypoglycemia with Intensive Insulin Therapy in Cardiac Surgery Patients: Predisposing Factors and Association with Mortality

Sotiris C. Stamou, Marcy Nussbaum, John D. Carew, Kelli Dunn, Robert M. Stiegel, Mark Reames, Eric Skipper, Francis Robicsek, Kevin W. Lobdell
Sanger Heart and Vascular Institute, Carolinas Medical Center, Charlotte, NC

DISCUSSANT: ANTHONY P. FURNARY

BACKGROUND: Intensive insulin therapy has become a standard modality for cardiac surgery patients. However, it has been associated with an increased risk of hypoglycemia (HA) compared with conventional insulin therapy. Our study sought to identify the factors predisposing to HA with intensive insulin therapy and investigate the effect of HA on early clinical outcomes following cardiac surgery.

METHODS: A concurrent cohort study of 1,593 consecutive patients undergoing cardiac surgery (coronary artery bypass grafting-CABG-valve or CABG and valve surgery) from January 2005 to March 2008 was carried out. Multivariable logistic regression analysis and propensity score matching were used to 1) identify the risk factors of developing HA (blood glucose ≤60 mg/dl) following cardiac surgery, and 2) compare the early clinical outcomes between patients who developed HA and those who did not. The propensity score-adjusted sample included 63 patients who developed hypoglycemia and 313 patients who did not. Bonferroni correction was used (16 tests–0.05/16 = 0.003).

Hypoglycemia and Postoperative Outcomes

<table>
<thead>
<tr>
<th></th>
<th>HA (n = 63)</th>
<th>No-HA (n = 313)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis</td>
<td>8%</td>
<td>2%</td>
<td>0.02</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>21%</td>
<td>3%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Prolonged ventilation (&gt;24 hrs)</td>
<td>41%</td>
<td>12%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Acute renal failure</td>
<td>14%</td>
<td>4%</td>
<td>0.007</td>
</tr>
<tr>
<td>Stroke</td>
<td>11%</td>
<td>3%</td>
<td>0.01</td>
</tr>
<tr>
<td>Length of stay ICU Hours (median, IQ Range)</td>
<td>108 (30–246)</td>
<td>40 (24–76)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mediastinitis</td>
<td>2%</td>
<td>1%</td>
<td>0.49</td>
</tr>
<tr>
<td>Readmission</td>
<td>17%</td>
<td>6%</td>
<td>0.004</td>
</tr>
</tbody>
</table>

RESULTS: Risk factors for HA included female gender (Odds Ratio [OR] = 3, 95% confidence intervals [CI] = 1.8–5.1, p = < 0.001), diabetes (OR = 2.6, CI = 1.5–4.4, p < 0.001), ejection fraction <40% (OR = 1.9, CI = 1.1–3.4, p = 0.02) and cross-clamp time >2 hours (OR = 3.2, CI = 1.4–7.2, p = 0.005). HA increased the risk for operative mortality both in univariate analysis (hypoglycemia 11.4% vs. no-hypoglycemia 3%, p = 0.002) and propensity score adjusted multivariate analysis (OR = 2.8, CI = 1.2–6.7, p = 0.002). HA also correlated with an increased risk for postoperative complications. (Table).

CONCLUSIONS: HA with intensive insulin therapy is independently associated with increased risk of death and adverse outcomes after cardiac surgery.
12. Survival After Resection of Truly Synchronous N2 Node Negative Non-Small Cell Lung Cancer

Thomas Fabian¹, Ayesha S. Bryant¹, John A. Federico¹, Robert J. Cerfolio²

¹Albany Medical College, Albany, NY; ²University of Alabama at Birmingham, Birmingham, AL; ³Hospital of St. Raphael, New Haven, CT

DISCUSSANT: STEVEN R. DEMEESTER

OBJECTIVES: Lung cancer patients may present with more than one suspicious lung nodule. Few studies accurately describe these patients leading to confusion regarding staging and management. We evaluated our experience in the surgical management of these patients with non-BAC synchronous lung cancer and their long-term outcomes.

METHODS: This is a multi-institutional retrospective cohort study of patients who underwent surgical resection of synchronous (non-BAC) lung cancer over an 11-year period utilizing the new TNM system.

RESULTS: Between 1/1997 and 12/2007, 121 operable lung cancers were identified in 60 patients (29 men) with a mean age of 71 years and median follow-up of 45 months. Thirty-nine patients had bilateral tumors (24 M1a, 15 different histology). Twenty-one patients had ipsilateral tumors of different histologic cell type, 16 were in different lobes and 5 were in the same lobe. Preoperative staging was completed utilizing PET scan in 51 (85%) patients and CT/MRI of the brain was performed in 50 (83%) patients. Negative N2 lymph node status was pathologically determined in all patients prior to undergoing resection of bilateral tumors, most frequently utilizing mediastinoscopy in 51 (85%). Surgical resections included 62 lobectomies and 54 sublobar resections. No pneumonectomies were performed. Average interval between operations for those with bilateral tumors was 4 months (range: 0.5–16). There was no surgical mortality in this series.

Overall survival at 3 and 5 years was 66% and 55% respectively. Cancer related survival was 88% at 3 years and 79% at 5 years. Sub group analysis demonstrated no difference in overall survival at 3 years between bilateral tumors of same histology (M1a) 65% and different histology 53% (p = 0.51) or between bilateral tumors 56% and ipsilateral tumors 53% (p = 0.46). There were no significant differences in survival based on histology, age, surgeon, or laterality. Cox-proportional hazards analysis showed that only gender affected overall survival (3 year survival for men 76% vs. women 48% p = 0.0476). Cancer recurred in 13 (22%) patients and was metastatic in 9 (15%) and local in 3 (5%). A 3rd lung cancer primary occurred in 2 (3%) patients after 5 years.

CONCLUSIONS: Surgical resection of synchronous lung cancer is associated with good long-term survival in patients that are N2 negative. Although the new TNM classification system labels these patients as M1a, stage IV disease, their survival acts more like separate T1 lesion and thus surgical resection should be considered in those patients that are N2 negative. Following curative resection these patients require close surveillance for recurrent and new tumors.
**+13. Improvement in Left Ventricular Morphology and Function After Mitral Valve Surgery: The Risk of Delaying Surgery**

**Alexis E. Shafii, M.D., A. Marc Gillinov, M.D., Tomislav Mihaljevic, M.D., Joseph F. Sabik, III, M.D., Lillian H. Batizy, M.D., Edward R. Nowicki, M.D., Eugene H. Blackstone, M.D.**

Cleveland Clinic, Cleveland, OH

**DISCUSSANT: LUIS J. CASTRO**

**BACKGROUND:** Mitral valve repair is associated with normalization of cardiac size and function in some, but not all, patients. The objectives of this study were to 1) characterize the response of left ventricular (LV) morphology and function to mitral valve surgery for degenerative disease, and 2) identify factors jeopardizing favorable remodeling after surgery.

**METHODS:** From 1986 to 2007, 2,778 patients with isolated degenerative mitral valve disease underwent valve repair (n = 2,607, 94%) or replacement (n = 171, 6%). 5,336 postoperative echocardiograms were available to characterize the temporal response of LV mass index and LV ejection fraction (LVEF) to surgery. Multivariable longitudinal repeated-measures analysis was performed to identify patient and cardiac comorbid factors associated with that response.

**RESULTS:** LV dimensions decreased in the first year after surgery, with a more rapid decline in end-diastolic than end-systolic diameter. There was an early reduction in LV mass index, also within 1 year, which was sustained thereafter. Reduction in LV mass index was less pronounced in patients with greater degrees of preoperative tricuspid regurgitation (\( P < .017 \)) or LA dilatation (\( P < .0001; \) Figure). LVEF increased slightly over the first postoperative year, but was modulated downward by preoperative heart failure symptoms (\( P < .0001 \)), ventricular arrhythmias (\( P < .002 \)), and low LVEF (\( P < .0001; \) Figure). Risk-adjusted response of LV morphology and function to valve repair and replacement was similar (\( P > .16 \)).

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* Samson Resident Prize Essay
CONCLUSIONS: A positive response toward normalization of LV morphology and function after surgery for degenerative mitral valve disease is greatest in the first year after surgery. The best response occurs when surgery is performed early in the course of the disease before LV dysfunction, LA dilatation, and tricuspid regurgitation have occurred. A point of irreversible ventricular remodeling is reached once symptoms and ventricular dysfunction have developed.

OBJECTIVE: Anatomic lung resection remains the mainstay of therapy for Stage IA non-small cell lung cancer. The 7th Edition of the AJCC staging system for non-small lung cancer has divided the previous T1 (≤3 cm) tumor designation into T1a (<2 cm) and T1b (>2 cm and ≤3 cm) groupings. These subsets still classify stage I node-negative non-small cell lung cancer. This new staging system focuses only on tumor size. We are left to hypothesize whether this classification may direct the extent of surgical resection needed. Anatomic segmentectomy may achieve comparable recurrence and survival compared to lobectomy in early-stage non-small cell lung cancer. We retrospectively reviewed our anatomic segmentectomy and lobectomy management of stage I (<3 cm) non-small cell lung cancer to determine differences in survival and local recurrence rates based on the new T1a and T1b classification.

METHODS: Retrospective review of 345 patients undergoing resection of pathologically confirmed Stage IA NSCLC via either lobectomy (n = 171) or anatomic segmentectomy (n = 174). Primary outcome variables include morbidity, mortality, recurrence and survival. Statistical comparisons were performed with the t-test and Fisher's exact test. Recurrence-free and overall survival was estimated utilizing the Kaplan-Meier method, with statistical significance being assessed by the log rank test.

RESULTS: The mean age of patients undergoing segmentectomy was older (69.7 vs. 65.6, p < 0.0001). Also, the mean pre-operative FEV1 was significantly lower in the segmentectomy group (1.80 vs. 2.45, p < 0.0001). However, there were no differences in gender or histology between groups. There was no difference in morbidity, mortality, overall survival, or recurrence rates between lobectomy and segmentectomy, when stratified for T stage (Table). Overall and recurrence-free survivals are significantly different when comparing T1a and T1b tumors (p = 0.026 and p = 0.001, respectively). Lobectomy was associated with a trend towards improved actuarial survival at 3 years for T1b tumors (80% vs. 67%, p = 0.075).

CONCLUSIONS: Anatomic segmentectomy may offer equivalent survival with reduced morbidity and mortality compared to lobectomy for patients with T1a non-small cell lung cancer, particularly those who are older and physiologically less fit. This new staging classification appears to aid in stratifying surgical therapy for larger stage 1 tumors.
<table>
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<tr>
<th></th>
<th>Morbidity (%)</th>
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<th>Recurrence (%)</th>
<th>Overall Survival (%)</th>
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<td>≤2 cm</td>
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<td>0</td>
<td>28.6</td>
<td>66.7</td>
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**OBJECTIVES:** A biodegradable polymeric film (BPF) reduces the extent and severity of postoperative adhesions in infants undergoing repeat sternotomy. Our hypothesis was that placing BPF beneath an expanded polytetrafluoroethylene pericardial membrane would both decrease pericardial adhesions and provide a physical barrier between the sternum and cardiac structures.

**METHODS:** We tested a novel combination of a biodegradable polymeric film (BPF) composed of polyethylene glycol (PEG) and polylactic acid (PLA) underneath an ePTFE membrane in an established rabbit model of pericardial adhesions. After sternotomy, a portion of pericardium was resected and abrasion of the epicardium was performed. Twenty-eight rabbits were randomly assigned to four treatment groups: Group A: Control - no BPF or ePTFE; Group B: BPF; Group C: ePTFE; and Group D: BPF+ePTFE. At 4 weeks post-sternotomy pericardial adhesions were scored grossly for area and density of adhesions using an established four-point (0–3) grading system for scoring adhesion severity.

**RESULTS:** In Group A (control) the mean adhesion score was 2.86 ± 0.37. Group B (BPF) had a significant reduction in adhesions compared to Group A (A = 2.86 ± 0.37 vs B = 0.57 ± 0.33, p < 0.0001). Group D (BPF+ePTFE) had a similarly low adhesion profile to Group B (D = 1.0 ± 0 vs B = 0.57 ± 0.33, p = ns), but considerably less adhesions than Group C (ePTFE) alone, (D = 1 ± 0 vs C = 2.75 ± 0.46, p < 0.0001).

**CONCLUSIONS:** The placement of the PEG/PLA biodegradable polymeric film resulted in minimal pericardial adhesions. In addition, the placement of the PEG/PLA film underneath ePTFE at the time of sternal closure provides a novel combination to reduce the extent and severity of postoperative intrapericardial adhesions and to create a physical barrier between the sternum and cardiac structures.
SATURDAY, JUNE 26, 2010

6:00 am – 11:30 am  SPEAKER READY ROOM, Hacienda Hallway
6:00 am – 12:00 pm  REGISTRATION, Hacienda Foyer
6:30 am – 7:30 am  CONTINENTAL BREAKFAST, Anacapa Ballroom
6:30 am – 10:30 am  EXHIBITS, Anacapa Ballroom
7:00 am – 8:15 am  CONCURRENT FORUMS
                   (5 minutes presentation, 3 minutes discussion)

A D U L T  C A R D I A C

Hacienda Ballroom

Moderators: Thomas A. Pfeffer
            Christopher T. Salerno

CF1. Mid-Term Results with TEVAR for Chronic Type B Aortic Dissection with Associated Aneurysm

Cyrus J. Parsa, Judson B. Williams, Syamal Dave Bhattacharya, Walter G. Wolfe*, Richard L. McCann,
G. Chad Hughes
Duke University Medical Center, Durham, NC

OBJECTIVES: The use of thoracic endovascular aortic repair (TEVAR) for complicated chronic Type B aortic dissection with associated descending thoracic aneurysm remains controversial. Concerns include potential ischemic complications due to branch vessel origin from the chronic false lumen as well as continued retrograde false lumen/aneurysm sac pressurization via fenestrations distal to implanted endografts. The purpose of the present study was to examine mid-term results with TEVAR for chronic (>2 weeks) Type B aortic dissection with associated aneurysm so as to better understand the potential role of TEVAR for this condition.

METHODS: Between 3/05 (date of initial FDA approval)–12/09, n = 51 TEVAR procedures were performed at a single institution for management of chronic Type B dissection. The indication for TEVAR was aneurysm in all cases. A subset of n = 7 patients (13.7%) underwent placement of EndoSure™ wireless pressure measurement system (CardioMEMS, Inc., Atlanta, Georgia) in the false lumen adjacent to the primary tear for monitoring aneurysm sac/false lumen pulse pressure (ASP) status-post TEVAR. Devices utilized

* WTSA Member
were Gore TAG (n = 36; 70.6%), Zenith TX2 (n = 12; 23.5%), and Medtronic Talent (n = 1; 2%); n = 2 (3.9%) patients received more than one type of device. Nearly half the cohort (n = 24; 47.1%) had prior aortic surgery including open AAA repair (n = 3; 12.5%), endovascular aortic repair (n = 2; 8.3%), open descending thoracic aortic repair (n = 5; 20.8%), or prior Type A dissection or arch repair (n = 14; 58.3%).

RESULTS: Mean patient age was 57 ± 12 years (range: 30–82) and n = 14 (27.5%) were female. Mean aortic diameter was 6.2 ± 1.4 cm. There were no in-hospital/30-day deaths, strokes, or permanent paraplegia/paresis. There were no complications related to compromise of downstream branch vessels arising from the false lumen. N = 2 patients (3.9%) who had pre-existing ascending aortic dilation suffered retrograde acute Type A aortic dissection following implantation of a Zenith TX2 device, which has proximal bars for fixation, both were repaired successfully. Median post-op LOS was 4 days (range: 1–49 days). At a mean follow-up of 12.1 ± 12.5 months (range: 1–51 months), all cause mortality was 15.7% (n = 8). There was a single late aortic death (2.0%) from endograft infection. N = 4 patients (7.8%) required secondary endovascular re-intervention for Type I endoleak, whereas n = 3 (5.9%) required additional distal endografting for downstream aortic dilatation; re-intervention was successful in all cases. N = 2 patients (3.9%) required late conversion to open repair, one for endograft infection and one for continued sac expansion; the single late aortic death occurred following endograft removal for infection. All n = 7 patients with EndoSure™ wireless pressure measurement system exhibited a decrease in ASP indicating a depressurized false lumen. The ASP ratio decreased from 52 ± 27% at the pre-discharge measurement to 14 ± 5% at the latest follow-up reading (p = 0.029).

CONCLUSIONS: This series demonstrates that TEVAR for chronic Type B dissection is safe and effective at early mid-term follow-up. ASP measurements demonstrate a significant reduction in false lumen endotension thus ruling out clinically significant persistent retrograde false lumen perfusion and provide proof of concept for a TEVAR-based approach. Longer-term follow-up is needed to determine the durability of TEVAR for this aortic pathology.

OBJECTIVES: Pulmonary dysfunction/multiorgan failure (PD/MF) due to antibiotic-refractory pulmonary infection is an important cause of mortality and morbidity after cardiac operations. Moreover, National data show that postoperative PD/MF is increasing, possibly due to emergence of antibiotic-resistant pathogens. In this study, patients with primary PD/MF after major cardiac operations were managed with immune augmentation to test the hypothesis that correction of preoperative and/or cardiopulmonary bypass-induced immune depletion would be therapeutically efficacious.

METHODS: Since 2002, 44 consecutive patients who developed primary antibiotic-refractory PD/MF were treated with intravenous immunoglobulin (IVIgG) at 18–24 gms daily for 5 days (0.3 gms/kg × 5 days; 1.5 gm/kg total dose). Thirty had undergone complex valve and/or aortic surgery and 14 coronary bypass. Mean age was 66 years (range: 39–90 years). Preoperatively, 94% had significant comorbidity; 73% presented acutely, 52% were hypo-albuminemic, and 39% had antecedent pulmonary derangement. Using retrospective chart review, relevant clinical variables were assessed for 3 days prior to beginning IVIgG (on Day 0) and for 3 days afterward (4 days). A postoperative morbidity index (PMI) was generated as a weighted sum of: worsening lung infiltrates (1) = unilateral, 3 = bilateral, 5 = generalized; leukocytosis (L) = 1 for each k > 10 k; pulmonary dysfunction (P) (sputum, work of breathing, O2 requirement, each) = 1 = mild, 2 = moderate, 3 = severe; (V) intubation = 5; septic shock (S) = 3; renal (R) 1 for each 0.4 mg/dl creatinine elevation > 1.5 mg/dl; G1 (G) ileus = 2; hepatic dysfunction (H) = 2; thrombocytopenia (T) platelet count < 50 k = 2; and delirium (D) = 2. Using each patient as his or her own control, the therapeutic effect of IVIgG was assessed with linear regression analysis of PMI over time with a spline and a knot at Day 0, coincident with beginning IVIgG (Figure).

RESULTS: At Day 0, all patients were refractory to major antibiotics with morbidity of: L-100%, P-98%, V-61%, S-24%, R-61%, G-24%, H-9%, T-36%, and D-9%. IgG levels, obtained in the last 14 patients, were consistently low. Using linear regression analysis of PMI prior to IVIgG, the patients’ clinical status was deteriorating (slope = 3.59, SE = 0.41, t = 8.62, p < 0.0001). After beginning IVIgG at Day 0, improvement in clinical course was observed (slope = −1.98, SE = 0.20, t = 9.75, p < 0.0001). In the spline function analysis, IVIgG administration was associated with significant improvement in clinical status (p < 0.0001), as evidenced by a fall in PMI to normal over the
course of immune augmentation (Figure). Despite serious baseline profiles at Day 0, 42 of 44 patients (95%) recovered uneventfully to hospital discharge. No significant complications of IVIgG therapy occurred.

CONCLUSIONS: This experience suggests that management of immune dysfunction with IVIgG is safe and effective for treatment of primary PD/MF after adult cardiac surgery. In appropriately selected patients, a major therapeutic effect is evident, and the addition of immune augmentation to standard ICU management has the potential for reducing overall operative mortality for adult cardiac surgery to near-zero. Expanded treatment of patients with postoperative immune dysfunction seems indicated, together with investigation of immuno-modulatory mechanisms.

OBJECTIVES: Preference for arterial inflow during surgery for type A acute aortic dissection is still controversial. Antegrade central perfusion prevents malperfusion and retrograde cerebral embolism, and the ascending aorta gives arterial access for rapid establishment of systemic perfusion, especially in situations of hemodynamic instability. It has not been used routinely, however, because of the disruption caused to the aorta. We evaluated the efficacy and safety of a simple antegrade perfusion technique: routine cannulation of the dissected aorta for the repair of type A acute aortic dissection.

METHODS: Surgical results were analyzed for 83 consecutive patients with type A acute aortic dissection; these were treated surgically, either urgently or emergently, by prosthetic graft replacement of the ascending aorta, hemiarch or total arch under hypothermic circulatory arrest, between 2002 and 2009. The ascending aorta was routinely cannulated with epiaortic echo guidance using the Seldinger technique, and antegrade systemic perfusion was evaluated by dual dynamic display mode color Doppler ultrasound.

RESULTS: Ascending aorta cannulation and systemic antegrade perfusion via the dissected ascending aorta was safely performed in all cases; no case required any switching of the cannulation site. There was no malperfusion or thromboembolism due to ascending aorta cannulation. Cardiopulmonary bypass was initiated on average 23.5 minutes after skin incision, and hypothermic circulatory arrest was established 22.5 minutes after initiation of cardiopulmonary bypass. Synchronized Epiaortic 2-Dimensional and color Doppler imaging provided real-time monitoring sufficient for the placement and proper perfusion of ascending aorta cannulation, as well as the location of the intimal tear and perfusion to the arch vessels. Real time epiaortic 3-Dimensional imaging also provided dynamic anatomical landmarks of the dissected aorta. There were five in-hospital deaths (5/83 = 6.0%) and eight strokes (preoperative 6/83 = 7.2%, postoperative 2/83 = 2.4%). A total of 78 patients (78/83 = 94%) were discharged and have been followed up without major adverse cardiac events for a mean period of 31.8 months.

CONCLUSIONS: Ascending aorta cannulation is a simple and safe technique which provides a rapid and reliable route of antegrade central systemic perfusion in type A acute aortic dissection.
BACKGROUND: Heart failure is one of the fastest growing epidemics in healthcare today. Despite optimal medical therapy, many heart failure patients progress to end-stage disease with poor outcomes. Currently, two broad treatment strategies are being developed—cellular and mechanical, each holding therapeutic promise but together have not been reported yet. The goal of this study was to determine if combining a cardiac support device with cell-based therapy could prevent progressive adverse left ventricular remodeling, more than either therapy alone, in a rat model of myocardial infarction.

METHODS: This study was completed in two parts. In Part I, mesenchymal stem cells were isolated and seeded on a biosynthetic scaffold. In Part II, the therapeutic efficiency of either: cardiac support device, stem cell therapy or combination therapy was compared.

In Part I, bone marrow aspiration of rodent femurs, containing mesenchymal stem cells (MSC), was subjected to green fluorescence protein (GFP+) lentivirus transduction and fluorescence-activated cell sorting—selecting for GFP+ MSCs. A suspension of GFP+ MSCs was then loaded on a collagen-based scaffold at 37°C for 24 hours, to achieve maximal cell engraftment.

In Part II, sixty rats underwent myocardial infarction and were randomly assigned to 1 of 4 groups: (1) control, (2) stem cell therapy, (3) cardiac support device, and (4) combination of stem cell therapy and cardiac support device. Left ventricular shape, size, and function were measured with bi-weekly echocardiography. The animals were sacrificed at 6-weeks, followed by end-of-life histopathological analysis.

RESULTS: After MI/treatment intervention, the ejection fraction remained preserved (80.2% to 74.9%) in the combination group at an early time point (2-weeks) as compared to the control group (82.8% to 66.2%). By 6-weeks the combination therapy group had a significantly greater fractional area change (% FAC) compared to the control group (69.2% ± 6.7% and 49.5% ± 6.1% respectively, p = 0.03). Also, at 6 weeks the left ventricular wall thickness was greater in the combination group compared to stem cell therapy alone (1.79 ± 0.11 and 1.33 ± 0.13, respectively, p = 0.02).

CONCLUSIONS: Combining a cardiac support device with stem cell therapy preserves left ventricular function after MI, more than either therapy alone. Furthermore, stem cell delivery using a cardiac support device is a novel delivery approach for cell-based therapies.
Spliced SDF-1α Analog Stimulates Endothelial Progenitor Cell Migration and Improves Cardiac Function in a Dose-Dependent Manner Following Myocardial Infarction

**William Hiesinger**, John R. Frederick, J. Raymond Fitzpatrick, III, Pavan Atluri, Rebecca D. Levit, Ryan C. McCormick, Nicole A. Marotta, Jeffrey R. Muenzer, Ah-Young Kim, Y. Joseph Woo

**University of Pennsylvania, Philadelphia, PA; Emory University, Atlanta, GA**

**BACKGROUND:** SDF-1α is a potent, endogenous endothelial progenitor cell (EPC) chemokine that plays a key role in angiogenic precursor homing and activation in ischemic tissues. However, intrinsic SDF-1α expression is transient and insufficient for cardiac repair after significant myocardial infarction (MI). Administration of recombinant SDF-1α has been demonstrated to improve neovasculogenesis and cardiac function after MI but recombinant SDF-1α is a bulky protein with a relatively short half-life. Small peptide analogs, functionally comparable to native SDF-1α, may provide translational advantages including ease of synthesis, low manufacturing costs, and the potential to control delivery within tissues via engineered biomaterials. In this study, we seek to demonstrate that a minimized peptide analog of SDF-1α, designed by deleting the large central β-sheet region and splicing the N-terminus (activation and binding site) and C-terminus (extracellular stabilization region) with a truncated amino acid linker, will induce EPC migration and preserve ventricular function after MI.

**METHODS:** EPC migration was first determined in vitro by Boyden chamber assay. For in vivo analysis, male Lewis rats (n = 48) underwent LAD coronary ligation. At the time of infarction, animals were randomized into 4 groups and received peri-infarct intramyocardial injections of saline, SDF-1α (3 µg/kg), Spliced SDF Analog (3 µg/kg), or Spliced SDF Analog (6 µg/kg). After 4 weeks, animals underwent closed chest pressure-volume (P-V) conductance catheter analysis.

**RESULTS:** EPCs showed significantly increased migration when placed in both a recombinant human SDF-1α and Spliced SDF Analog gradient (Control 47 ± 9 cells/HPF vs. SDF 240 ± 20 cells/HPF; p = 0.009 vs. Spliced SDF Analog 237 ± 11 cells/HPF; p < 0.001 vs. Spliced SDF Analog [2X]). Animals treated with Spliced SDF Analog at the time of MI demonstrated a significant dose-dependent improvement in End-diastolic Pressure, Stroke Volume, Ejection Fraction, Cardiac Output, Stroke Work, and Arterial Elastance when compared to control animals. (Table 1).

**CONCLUSIONS:** A spliced peptide analog of SDF-1α containing both the N- and C-termini of the native protein induces EPC migration, improves ventricular function after acute MI, and provides a novel foundation for the clinical translation of cytokine based neovasculogenic therapy.
OBJECTIVES: The pathogenesis of aortic stenosis is initiated by mechanisms of inflammation. Stimulation of pro-inflammatory mechanisms, Toll-like receptor 2 and 4 (TLR-2 and TLR-4) pathways, causes aortic valve interstitial cells (AVICs) to change to an osteogenic phenotype. A primary characteristic of this osteogenic phenotype is an increased production of the potent bone-forming protein, bone morphogenetic protein-2 (BMP-2). The net inflammatory state of any tissue is determined by the balance of pro- and anti-inflammatory mechanisms. To maintain inflammatory homeostasis, cells must produce anti-inflammatory cytokines when stimulated by pro-inflammatory cytokines. We examined this balance in AVICs. Interleukin-1 receptor antagonist (IL-1RA) is a potent anti-inflammatory cytokine. We hypothesized that the anti-inflammatory response to pro-inflammatory stimulation is impaired in aortic stenosis. In human aortic valve cells from normal and stenotic aortic valves, our purpose was to examine: (1) the production of IL-1RA and (2) the ability of IL-1RA to protect against the phenotypic change in AVIC when stimulated by pro-inflammatory mechanisms (TLR-2 and TLR-4).

METHODS: AVICs were isolated from stenotic aortic valves resected at the time of aortic valve replacement for severe aortic stenosis (n = 4). Control AVICs were isolated from normal aortic valves from explanted hearts during cardiac transplantation (n = 4). IL-1RA production from AVIC cell lysates was determined (ELISA) after pro-inflammatory stimulation of TLR-2 (peptidoglycan, PGN, 10 µg/mL) and TLR-4 (lipopolysaccharide, LPS, 200 ng/mL) pathways. The ability of IL-1RA (100 µg/mL) to protect against phenotype change (BMP-2 production) was determined by immunoblotting of cell lysates of normal AVICs stimulated by the pro-inflammatory pathways of TLR-2 (PGN, 10 µg/mL) and TLR-4 (LPS 200 ng/mL). Statistics were by ANOVA.

RESULTS: The anti-inflammatory cytokine, IL-1RA, was significantly decreased in stenotic aortic valves. Untreated stenotic AVICs had undetectable levels of IL-1RA compared to 354.5 ± 12.9 pg/mL in controls (p ≤ 0.05) (Figure 1). Further, production of IL-1RA in response to pro-inflammatory stimulation (TLR-2 and TLR-4 pathways) was impaired in stenotic valves compared to controls: TLR-2 stimulation and TLR-4 stimulation in controls yielded 3.2- and 1.96-fold greater increase in IL-1RA, respectively, over stenotic AVIC (p ≤ 0.05). In normal AVICs, IL-1RA attenuated the TLR-2- and TLR-4-stimulated production of BMP-2 by 33% and 49%, respectively. (Figure 2).

CONCLUSIONS: An imbalance of pro- and anti-inflammatory mechanisms produces an osteogenic phenotype in AVICs. Stenotic aortic valves have dysfunctional mechanisms of anti-inflammation. The potent anti-inflammatory cytokine, IL-1RA, was undetectable in stenotic aortic valves. Further, the production of IL-1RA in response to pro-inflammatory stimulation of TLR-2 and TLR-4 was significantly impaired in stenotic aortic valves. We conclude that impaired mechanisms of anti-inflammation contribute to the pathogenesis of aortic stenosis.
CF7. Cardiac Retransplantation: A Viable Option
Hannah Zimmerman, Romana Coelho-Anderson, Nicole Mineburg, Michael McCarthy, Jack G. Copeland, III*
University of Arizona, Tucson, AZ

OBJECTIVE: Cardiac retransplantation has been considered higher risk for most recipients especially those less than 6 months from their initial transplantation. Our hypothesis is that cardiac retransplantation is a viable option for the appropriate cardiac recipient population.

METHODS: We conducted a retrospective study of 26 patients who had all received either a second, third or fourth cardiac transplantation over a 25-year period. 4 patients were emergently retransplanted for acute graft failure and have been removed from the study. Two of those four patients died and two lived long term. Comparisons were performed between 818 primary transplants and the group of 22 elective retransplant patients for the following variables: actuarial survival curves for first and second time cardiac transplantation, one year survival, age at time of transplant, ischemic time, years of survival, and sex of the patients. The subsequent retransplants (third and fourth time) were also evaluated.

RESULTS: We have performed over 840 cardiac transplants. 22 patients electively received a second, 4 a third, and 1 a fourth cardiac transplant for coronary vasculopathy or chronic graft failure. Sixteen patients were men (72%) and 6 were women (27%). Mean survival in years for a first time cardiac transplant patient from our institution is 11.5 years; for a second time transplant from the date of retransplantation is 9.5 years. Average age at time of first transplant was 47.8 years; 44.3 years at time of second transplant. No significant difference was noted in actuarial survival curves. Graft survival at one year for first transplant was 88.6% and 82% for retransplant patients; p value = 0.16. Patient survival at 10 years was nearly identical for first time and retransplant patients (88%). (see actuarial survival functions). The longest survivor was a patient that received three transplants and lived 24 years after the initial transplant. The recipient of 4 transplants is currently surviving at 23 years post initial transplant.

CONCLUSION: Based on our results, cardiac retransplantation up to 4 times is a reasonable option for elective recipients with coronary vasculopathy or chronic graft failure. There is no difference in survival between primary and retransplant patients. The retransplant group is younger than the primary group. Careful selection of this small group of cardiac recipients (3% of the total) may be the key to success.

* WTSA Member

CF8. Reproducibility of Left Atrial Ablation with High Intensity Focused Ultrasound in a Calf Model
Nestor Villamizar1, Jennifer Crow2, Valentino Pacentino, III1, Louis DiBernardo2, Mani Daneshmand1, Mark Groh1, Carmelo Milano1
1Department of Surgery, Duke University, Durham, NC; 2Department of Pathology, Duke University, Durham, NC, 3Mission Saint Joseph Hospital, Asheville, NC

BACKGROUND: Histological analysis of left atrial (LA) epicardial ablations, created with high intensity focused ultrasound (HIFU), has not been previously reported. Achieving transmural tissue ablation may be necessary for successful treatment of atrial fibrillation with this epicardial energy source. The purpose of this study is to evaluate the reproducibility of transmural LA ablation using the HIFU system in a calf model.

METHODS: 7 heparinized bovines (weight range: 63–114 kg) underwent a beating-heart LA ablation with a single application of the HIFU device as described in the indications for use. All animals were sacrificed at the end of the procedure and the LA was fixed in 10% formalin. The LA was divided into 8 blocks and 5 µm histology slides were obtained from each block. Masson's Trichrome and Hematoxylin and Eosin stained were performed. Measurements were obtained from a total of 313 slides. In addition, human LA from donors that did not meet criteria for transplantation is currently being processed in a similar manner to the bovine LA to extrapolate the findings of the calf model into humans.

RESULTS: LA thickness ranged between 2.5 and 20.1 mm, with a mean of 9.02 mm. HIFU ablation consistently produced a 100% transmural lesion in LA thickness up to 6mm, which includes adipose tissue of up to 2.7 mm. In addition, a transmural lesion was observed in 90% of tissues that were up to 10 mm thick and in 85% up to 15 mm of thickness (see Figure). All nerve bundles identified within the HIFU beam appeared irreversibly injured independent of size or tissue depth.

CONCLUSIONS: Calf LA thickness in this study was greater than the reviewed literature of human clinical and autopsy measurements of LA thickness. Given that LA thickness is expected to measure less than 10 mm in the majority of patients treated with the HIFU system, a transmural lesion is expected to occur in 90–100% of these patients with a single HIFU application. Confirmation of this speculation is currently under investigation. These histological results may correlate with a high success rate of atrial fibrillation ablation using the HIFU system.
OBJECTIVES: The complexity and inherent limitations of exposure and visualization have impacted resident training in mitral valve surgery. We propose that implementation of simulation-based learning in the curriculum would improve residents' acquisition of skills for mitral valve surgery.

METHODS: Eleven residents underwent simulation training in mitral valve annuloplasty. Six were part of the integrated six-year cardiothoracic surgery training program, and five had completed a general surgery program. After reviewing an instructional videorecording on mitral valve repair using the porcine model and plastic model, each resident performed a mitral ring annuloplasty using the porcine model, and their performance was video-recorded. Each video-recording was reviewed by an attending surgeon and formative feedback provided with superimposed audio narration; the narrated recordings were returned to the residents for review. After a three-week practice period using the plastic model, the residents performed mitral annuloplasty using the porcine model and were again video-recorded. Performance assessment of technical components pre- and post-feedback was done in a blinded fashion using a 5-point rating scale (5 = good, 3 = average, 1 = poor).

RESULTS: Time to completion improved from a mean of 31 (±9) min to 25 (±6) min after the three-week practice period based on the porcine model combined with formative feedback (p = 0.03). Overall improvement in the technical components was achieved in all residents, although there was wide variability with the mean near or slightly above “average” (Table). Some residents demonstrated minimal improvement using this model.

CONCLUSIONS: Simulation-based learning employing formative feedback results in overall improved performance in mitral annuloplasty using the porcine model. In complex surgical procedures, where optimal educational opportunities may be limited, simulation may provide necessary early training and a means for practice with formative feedback. An important implication is that having a “passing” grade (e.g., 4 or greater) was established as a prerequisite for residents to participate in clinical mitral valve surgery; many residents would require additional training and remediation, a finding that is not surprising given the complexity of this procedure.

* WTSA Member
Change in Resident Performance After Practice

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<th>Post-Score (SD)</th>
<th>Post-Range</th>
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</tr>
<tr>
<td>Suture management</td>
<td>2.7 ± 1.0</td>
<td>1–4</td>
<td>3.6 ± 0.8</td>
<td>2–5</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

OBJECTIVE: In the oncologic population, pericardial effusions are a frequent and potentially life-threatening occurrence. Despite decompression, some patients develop paradoxical hemodynamic instability, with hypotension and shock. The purpose of this study was to identify characteristics associated with this poorly understood phenomenon, and prognostic factors in oncologic patients treated for pericardial effusion.

METHODS: Retrospective review of 179 consecutive pericardial windows performed for pericardial effusion in a tertiary cancer center over a 5-year period (1/04–3/09). Demographic, surgical, pathologic, and echocardiographic data were analyzed for the endpoints of postoperative hemodynamic instability (pressor-dependent hypotension requiring ICU admission) and overall survival.

RESULTS: The most common malignancies were lung (44%), breast (20%), hematologic (10%), GI (7%). Overall survival for the group was poor (median survival 5 mo); however, patients with hematologic malignancies fared significantly better than the others (median survival 36 mo, p = 0.008). Postop instability (PHI) occurred in 19 patients (11%). These patients were more likely to have evidence of tamponade on echocardiogram (89% vs. 56%, p = 0.005), positive cytology/pathology (68% vs. 41%, p = 0.03), and higher volume drained (674 ml vs. 493 mL, p = 0.003). Overall survival was significantly shorter (median survival 35 vs. 189 days) in those who developed PHI (HR = 3, p < 0.001), and the majority of them (11/19, 58%) did not survive their hospitalization.
CONCLUSION: Postoperative hemodynamic instability after pericardial window portends a grave prognosis. Evidence of tamponade, larger effusion volumes, and positive cytology may predict those patients at higher risk of developing this phenomenon and anticipate a need for invasive monitoring and ICU admission postoperatively. Patients with hematologic malignancies fare significantly better when presenting with pericardial effusions.

Multivariate Analysis of Predictors of Postoperative Hemodynamic Instability

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Cytology</td>
<td>5.819</td>
<td>1.190-28.311</td>
<td>0.029</td>
</tr>
<tr>
<td>Tamponade</td>
<td>4.117</td>
<td>0.0340-29.222</td>
<td>0.062</td>
</tr>
<tr>
<td>Volume (per mL)</td>
<td>1.003</td>
<td>1.0001-1.005</td>
<td>0.043</td>
</tr>
</tbody>
</table>

OBJECTIVE: To help distinguish clinically important biological differences, an International Consensus is reclassifying lung adenocarcinoma into distinctly defined pathologic definitions that are based in part on tumor invasiveness. The extent of invasiveness in lung adenocarcinoma (AdCa) has been shown to be an independent predictor of survival. However, the importance of tumor invasion in guiding the extent of lung resection has not been completely investigated. The purpose of this study is to evaluate the association between surgery type and survival outcome in patients with noninvasive and microinvasive (NI/MI) AdCa and invasive lung AdCa.

METHODS: Resected lung AdCa (n = 178) from 1997 to 2000 were reviewed. Analyses were performed of surgical resections in the following defined subgroups: noninvasive (NI), microinvasive (MI) (linear invasion <0.6 cm), and invasive (linear invasion >0.6 cm). Cox regression analysis was performed to create multivariate models for survival analysis. Independent-samples t-test was used to compare 3-year survival rates.

RESULTS: All four patients who underwent a wedge resection for NI/MI AdCa tumors survived to five years compared to 12 out of 18 patients with invasive AdCa tumors (p < 0.001). 89% of patients who had a lobectomy for NI/MI AdCa (n = 28) were alive after five years, while only 58% of 123 patients who underwent a lobectomy for invasive AdCa survived (p < 0.001). In the invasive AdCa subgroup, there was no difference between patients who had a wedge resection compared to those who had a lobectomy (67% vs 57%; p = 0.305). In multivariate analysis of the lobectomy subgroup, extent of linear invasion, age, and lymph node status were associated with survival.

CONCLUSION: These results suggest that in lung adenocarcinoma, the invasion extent is an important indicator of risk of death and that for noninvasive or microinvasive tumors, a lung-sparing limited resection may be adequate. Although the decision leading to the type of surgical resection is multifactorial, the extent of tumor invasion should be taken into account in the decision-making process.
OBJECTIVES: Obliterative bronchiolitis (OB) is the predominant histopathologic finding in patients with chronic rejection after lung transplantation. This fibroproliferative transformation within the small airways of the lung allograft is poorly understood, however studies suggest that epithelial mesenchymal transition (EMT) may play a role in this process. In addition, transplant immunosuppressive therapy has been shown to cause EMT in renal tubular epithelial cells and subsequent renal fibrosis. The primary aim of this study was to determine whether transplant immunosuppressive therapy can contribute to EMT in airway epithelial cells.

METHODS: A bronchial epithelial cell line, RL-65, was treated for 5 days with several immunosuppressive agents including cyclosporin-A (CSA), tacrolimus (TAC), azathioprine (AZA), and mycophenolic acid (MYC) in the presence or absence of prednisone. We then analyzed the bronchial epithelial cells for the presence of mesenchymal morphology and protein markers.

RESULTS: After treatment with CSA the bronchial epithelial cells became enlarged and lost cell-cell adhesions (Figure 1). Similarly, treatment with MYC resulted in elongated cell shape and visible stress fibers, typical of EMT. In addition, there was a significant upregulation of mesenchymal markers such as vimentin seen with all treatments but most marked with CSA and MYC (Figure 2). Overall, the expression of the epithelial marker, E Cadherin, did not change with these treatments.

CONCLUSIONS: Overall we found that certain immunosuppressive agents may contribute to EMT in bronchial epithelial cells in vitro. This may provide novel insights into the pathogenesis of OB after lung transplantation.
OBJECTIVES: Most cases of dysphagia after a cervical esophagogastric anastomosis (CEGA) respond to occasional esophageal dilatation in the outpatient setting. For more recalcitrant CEGA strictures, a standardized therapeutic protocol has been developed that consists of instruction in and implementation of self-dilatation with a Maloney dilator, as previously described. Over the past three decades, many patients with refractory strictures have been managed at our institution using this protocol; however, its efficacy has never been evaluated in a systematic way. This study was undertaken to determine the outcomes of this treatment.

METHODS: Our Esophagectomy Database retrospectively identified 158 (7.6%) of 2075 transhiatal esophagectomy (THE) and CEGA patients in whom a self-dilatation program was required. An esophageal-specific survey evaluated frequency and duration of dilatation, swallowing function, and satisfaction with treatment. The relationship between anastomotic leak, subsequent stricture, and the need for self-dilatation was assessed. A validated survey tool, the SF-36v2, was used to assess overall functioning and quality of life.

RESULTS: Of the 158 patients who eventually required self-dilatation, 22% experienced post-op CEGA leaks vs. 11% of THE patients who did not require this treatment (p = 0.0002). At the time of this study, 78 were alive; 34 (43%) participated in the esophageal-specific survey. Median duration of self-dilatation therapy was approximately 10 years. At the time the survey was conducted, 18 (33%) patients were still passing their dilator with an average frequency of once every 64 days. Twenty-two (66%) had some dysphagia, though 29 (85%) were satisfied with their ability to eat. There were no adverse events from self-dilatation, and all patients surveyed indicated they would use self-dilatation therapy again under similar circumstances. Health insurance paid some or all of the cost of the dilators in 23 (68%) cases. Of the 34 patients who responded to the esophageal survey, 20 (59%) responded to the SF-36v2 at a later date. Compared to the general population, 55% (11/20) of participants scored at or above the mean for physical health status. For mental health status, 70% (14/20) of responders scored at or above the general population’s mean. Most of the patients’ notable physical limitations were caused by disease states not related to their THE or self-dilatation therapy.

CONCLUSIONS: Refractory CEGA strictures are best managed by initiating therapy with frequent outpatient dilatations, then transitioning to self-dilatation. Home use of Maloney dilators by a properly trained and motivated patient is a safe, well-tolerated,
convenient, and cost-effective way to achieve and maintain comfortable swallowing. Many patients eventually wean from self-dilatations, and all patients decrease their frequency of dilatation over time. The effectiveness of self-dilatation therapy for CEGA stricture is reflected in the overall high level of physical and mental functioning as assessed with the SF-36v2 survey tool.

### OBJECTIVE:
Outcomes assessing the various treatment modalities for esophageal cancer primarily report results in terms of morbidity, mortality, clinical outcome parameters, survival and quality of life improvements. Controversy remains regarding the most appropriate stage-by-stage treatment of esophageal cancer. There is currently no data outlining the comparative costs of various surgical, non-surgical and combined modalities treatment and the added costs associated with complications in each treatment group.

### METHODS:
Four separate treatment groups were studied, 1—Surgery alone (S); 2—Chemotherapy followed by surgery (CS); 3—Chemoradiotherapy followed by surgery (CRS); and 4—Chemoradiotherapy alone (CR) from 2001 to 2008. 13 consecutive patients from each group who received their entire treatment at our institution were identified. Patient demographics and outcomes in the surgical groups were taken from a prospective IRB approved database, while information for neoadjuvant therapy and the definitive chemoradiotherapy group was obtained by chart review. All treatment related costs in each group of patients including investigations, primary treatment and management of complications were extracted from institution’s financial data management system and compared for the duration of treatment between the date of diagnosis to 90 days after completion of primary therapy.

### RESULTS:

<table>
<thead>
<tr>
<th>Treatment Groups</th>
<th>Age (Mean)</th>
<th>Inpatient Days Median (Range)</th>
<th>ASA 3–4 (n)</th>
<th>Tumor Stages (n)</th>
<th>Charges ($)</th>
<th>Overall Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery alone (S)</td>
<td>66</td>
<td>8 (7–30)</td>
<td>7</td>
<td>Tis–2, 1–6, II–5, III–2</td>
<td>78,955</td>
<td>33,881</td>
</tr>
<tr>
<td>Chemotherapy &amp; surgery (CS)</td>
<td>60</td>
<td>9 (6–13)</td>
<td>10</td>
<td>II–11, III–4</td>
<td>96,166</td>
<td>40,306</td>
</tr>
<tr>
<td>Chemoradio-therapy &amp; surgery (CRS)</td>
<td>62</td>
<td>10 (7–18)</td>
<td>10</td>
<td>II–5, III–10</td>
<td>163,397</td>
<td>71,219</td>
</tr>
<tr>
<td>Chemoradio-therapy (CR)</td>
<td>62</td>
<td>14 (9–28)</td>
<td>13</td>
<td>III–7, IV–8</td>
<td>122,588</td>
<td>55,973</td>
</tr>
</tbody>
</table>

* WTSA Member
All costs associated with respiratory, cardiac, metabolic, surgical, thromboembolic complications were identified. 47% of surgical patients had complications vs. 87% of the patients who had chemoradiotherapy alone. ASA status of 3–4 was not associated with increased costs in any groups. The definitive chemoradiotherapy group encountered higher costs due to complications contributing to 22% of the total cost, whereas the cost of complication management was only 3% for surgery alone group. In the Surgery alone group the mean increased costs of complications were cardiac $2710, respiratory $1980, and GI/Metabolic $3608. The CR group experienced predominantly GI/Metabolic complications which increased cost by an average of $11060.

CONCLUSION: As expected overall costs and charges rise as the number of treatment modalities utilized increase. However surgery alone costs only 60% compared to definitive Chemoradiotherapy. Complications significantly increase costs in all treatment groups with the largest percentage of costs secondary to complications noted in the Chemoradiotherapy alone population. Treatment decisions should be evidence based but include cost assessment when treatment approaches are considered otherwise equivalent.

BACKGROUND: Pneumonia is often associated with subclinical oropharyngeal dysphagia and silent aspiration. We instituted a comprehensive swallowing evaluation prior to initiation of oral feedings following esophagectomy after demonstrating that post-esophagectomy pneumonia strongly predicts mortality. This study assesses the impact of this evaluation on the detection of aspiration and the occurrence of pneumonia after esophagectomy.

METHODS: All patients who underwent esophagectomy between January 1996 and June 2009 were reviewed. Multivariable logistic regression analysis assessed the effect of preoperative and operative variables on the occurrence of aspiration and pneumonia. Separate analyses were performed on esophagectomy patients before (early era, 1/1996–12/2002) and after (later era, 1/2003–6/2009) a rigorous swallowing evaluation with careful clinical observation, cineradiography, and fiberoptic endoscopy was used routinely prior to initiation of oral feedings. Aspiration was defined by cineradiographic, endoscopic, and clinical features. Pneumonia was diagnosed using radiographic studies, culture data, and clinical status.

RESULTS: During the entire study period, 799 patients (379 early era, 420 later era) underwent esophagectomy; 30-day mortality was 3.5% (28 patients). Cervical anastomoses were performed in 70% of patients in the later era compared with 40% of patients in the early era. Overall, 96 patients (12%) had evidence of aspiration postoperatively, and the incidence of pneumonia was 14% (113 patients). Age (odds ratio 1.05 per year, p < 0.0001) and cervical anastomosis (odds ratio 2.69, p = 0.0009) predicted aspiration in all patients in a multivariable model. In the early era, age, cervical anastomosis, and aspiration independently predicted pneumonia (Table). Compared to the early era, postoperative aspiration was detected more commonly (16.4% vs 7.1%, p = 0.0001) but the incidence of postoperative pneumonia was significantly decreased (10.7% vs 17.9%, p = 0.002) in the later era. Neither anastomotic location nor aspiration predicted pneumonia in the later era (Table).

CONCLUSIONS: Esophagectomy is often associated with dangerous, subclinical aspiration, especially when a cervical anastomosis is used for reconstruction. Use of a comprehensive swallowing evaluation to detect aspiration prior to initiation of oral feedings significantly decreases the occurrence of pneumonia after esophagectomy.
Predictors of Pneumonia by Era

<table>
<thead>
<tr>
<th></th>
<th>Early Era</th>
<th>Later Era</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.03, p = 0.02</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Cervical Anastomosis</td>
<td>1.8, p = 0.04</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Aspiration</td>
<td>3.0, p = 0.01</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

BACKGROUND: For patients with stage IIA-N2 NSCLC, multimodality platinum-based treatment strategies with or without surgery are valuable options. ERCC1 over-expression in primary lung tumor specimens is associated with resistance to cisplatin-based adjuvant chemotherapy and may also be associated with radioresistance in lung cancer cells. The aim of this study is to evaluate the clinical implications of ERCC1 expression and other chemoresistance genes in metastatic mediastinal lymph nodes from patients with stage IIA (N2-positive) NSCLC patients treated with platinum-based chemotherapy.

METHODS: N2 lymph nodes from 20 (10 poor prognosis and 10 good prognosis) patients with N2-positive NSCLC were evaluated. Good prognosis patients were defined as alive and disease free greater than 36 months (41–77 months to date). Poor prognosis patients died within 36 months from lung cancer (range: 6–28 months). All 20 patients received platinum-based chemotherapy with or without surgery. ERCC1 expression was assessed by immunohistochemistry from pre-treatment N2 specimens. To determine if other chemo-resistance genes in N2 lymph nodes can predict survival, the Human Cancer Drug Resistance and Metabolism RT2 profiler PCR Array (SuperArray Bioscience) was used to profile the expression of 84 genes implicated in chemotherapy-resistance.

RESULTS: ERCC1 expression was positive (>50% positive tumor nuclei) in all 20 patients by immunohistochemistry and confirmed by real-time RT-PCR. ERCC1 expression was not an independent prognostic factor for overall survival. Up-regulation of 3 genes (BAX, GSTD1, and NFKB1B) was noted in metastatic lymph nodes from patients with poor prognosis. EGFR mRNA and protein expression did not correlate with survival in N2-positive NSCLC patients.

CONCLUSIONS: Our results show that at our institution, ERCC1 expression does not correlate with survival in N2-positive NSCLC patients. Other genes implicated in chemoresistance from N2-positive lymph nodes, however, may predict patients with a survival benefit from chemotherapy with a platinum-containing regimen. Since responses to chemotherapy are variable, determining which patients are not likely to respond to platinum-based therapy will spare these patients from the toxicity of these agents and will allow options for alternative therapy.
CF16. Impact of Neoadjuvant Chemo-Radiotherapy Therapy Followed by Surgical Resection on Node Negative T3 and T4 Non-Small Cell Lung Cancer (NSCLC)

Benedict D.T. Daly, Michael I. Ebright, Hiran C. Fernando, Ken S. Zaner, Donna M. Morelli, Lisa A. Kachnic
Boston Medical Center, Boston, MA

BACKGROUND: The treatment of patients with node negative T3 and T4 NSCLC remains controversial. The purpose of this study was to examine the impact of neoadjuvant treatment with chemotherapy and concurrent high dose radiotherapy on survival.

METHODS: One hundred twenty-one patients underwent surgical resection for T3N0M0 and T4N0M0 NSCLC. Forty-seven patients received neoadjuvant chemotherapy and high-dose XRT (Chemo). Thirty-eight patients received a Carboplatinum doublet, eight a Carboplatinum doublet and one patient with a kidney transplant Taxol alone. All of these patients received at least 5940 cGy of radiation concurrently. Seventy-six patients underwent surgical resection without induction chemotherapy (Surg). Twenty-one of this group had induction radiotherapy, 19 had adjuvant radiotherapy, four had intraoperative brachytherapy, eight adjuvant chemotherapy, two adjuvant chemo-radiotherapy, and 22 surgery alone. In the Chemo group, the impact of tumor location (central vs. peripheral), type of resection (pneumonectomy vs. lesser resection), presence or absence of residual tumor, and T status were evaluated as predictors of mortality. Survival was compared using the log rank test using SPSS version 17 and a p value < 0.05 was considered significant.

RESULTS: The five year survival and estimated median survival in the Chemo group were 60% and 90 months (std error = 36.7) and in the Surg group 25% and 22 months (std error 3.7) (p = 0.000) (Figure). Of the 47 patients in the chemo group, 36 patients with T3 tumors had a better survival than the 11 patients with T4 tumors (p = 0.046). The five-year survival and estimated median survival in patients with T3 tumors were 72% and 122 months (std error = 32.2) and in patients with T4 tumors 27% and 27 months (std error = 16.5). Tumor location (central 22 patients vs. peripheral 25 patients), type of resection (pneumonectomy 12 patients vs. lesser resection 35 patients), and the presence or absence of residual tumor (25 vs 21, 1 not defined) had no impact on survival. In the Chemo group one of the patients undergoing pneumonectomy died following surgery whereas no patient died in the group with a lesser resection. In the Surg group there was one death following pneumonectomy and one following a lesser resection.

CONCLUSIONS: Neoadjuvant chemotherapy and concurrent high dose XRT followed by surgical resection may improve survival in patients with node negative T3 and T4 NSCLC. Larger prospective studies will be required to validate these conclusions and define specific subsets of patients most likely to benefit.
**CF17. Older Children at Time of First Stage Palliation of Complex Univentricular Cardiac Anomalies Have Ongoing Mortality Vulnerability that Continues After the Cavopulmonary Connection**

Bahaaldin Alsoufi1, Mamdouh Al-Ahmadi1, Cedric Manlhiot2, Zohair Al-Halees1, Brian McCrindle2, Ahmad Moussa1, Yasser Al-heraish1, Avedis Kalloghlian1, Charles Canver1

1King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia; 2Hospital for Sick Children, Toronto, ON, Canada

**BACKGROUND:** Delayed 1st stage palliation of infants with hypoplastic left heart syndrome (HLHS) can be associated with poor outcome due to pulmonary hypertension (PHTN), volume load effect on systemic ventricle and atrioventricular valve (AVV). The study was undertaken to examine survival of children undergoing delayed 1st stage palliation of HLHS in the current era.

**METHODS:** Fifty-six consecutive Children who underwent 1st stage palliation at age older than 2 weeks between 2003–07 were reviewed. Separate competing risks analyses were performed to model outcomes (death, transition to next stage, or alive and waiting for transition to next stage) after Norwood operation and after bidirectional cavopulmonary connection (BCPC).

**RESULTS:** Median patient age was 30 days (15–118). 49% had HLHS and 51% had other complex univentricular variants. Mean ascending aorta diameter was 4.4 ± 1.8 mm, 10% had impaired dominant ventricle function, 11% had moderate AVV regurgitation and 30% had restrictive pulmonary venous return. Pulmonary blood flow was established via aorto-pulmonary shunt (n = 31), Sano shunt (n = 24), both (n = 1).

Following 1st stage palliation, patients required longer ventilation (11 ± 12 days), higher oxygen (40 ± 10%) and nitric oxide (12/56 patients) requirement and higher inotropic score (31 ± 20) compared to traditional management protocol.

Overall survival after the Norwood operation was 83%, 60%, and 45% at 1 month, 1 year, and 3 years. Two years after the Norwood operation 43% had died, 55% underwent BCPC and 2% were still waiting for BCPC. Factors associated with death occurring before BCPC were impaired dominant ventricle function (p = 0.02) and HLHS with aortic and mitral atresia (p = 0.06).

Of patients who had BCPC, after 2.5 years 40% subsequently had Fontan operation and 17% died without Fontan. Factors associated with death without Fontan operation were impaired ventricle function (p = 0.001) and moderate AVV regurgitation (p = 0.06).

Detrimental effects of delayed presentation such as PHTN, ventricle impairment and AVV regurgitation were evident in non-survivors in various stages and in patients not qualifying to receive or failing subsequent palliative surgery.

**CONCLUSIONS:** Post-operative care in children >2 weeks of age undergoing first stage palliation for HLHS and variants is different from traditional management with frequent requirement of pulmonary vasodilatation and high inotropic support.

Despite acceptable early mortality, a significant hazard of death continues through all steps of multi-stage palliation due to PHTN, volume load effects resulting in systemic ventricle impairment and AVV regurgitation. Those patients should be closely monitored for timely referral for heart transplantation when indicated.
OBJECTIVES: The optimum surgical strategy for critically ill neonates and infants with Ebstein's anomaly (EA) remains controversial. Some centers have advocated a single ventricle pathway while others have adopted a palliative operation or listed patients for transplant. The purpose of this study was to examine our late outcomes for neonates and young infants with EA who have undergone complete biventricular repair as the primary definitive operation.

METHODS: Between March 1994 and April 2009, 30 critically ill neonates and infants underwent surgery for EA. There were 22 neonates (<1 month) and 8 young infants (<5 mo). Median age at operation was 12 days. Mean weight 3.88 ± 0.38 kg. Biventricular procedure consisted of: (1) tricuspid valve [TV] repair, using a Danielson-type technique or replacement; (2) resection right atrialoplasty; and (3) fenestrated closure of atrial septal defects and (4) repair of all associated cardiac defects. Long-term follow-up was obtained via clinic visits and echocardiography. Primary outcome measures included: (1) TV competency, (2) freedom from reoperation, (3) long-term survival, and (4) functional status [NYHA Class].

RESULTS: A biventricular procedure was performed in 27 pts (90%, 27/30). Tricuspid valve repair was achieved in 25 patients. Two underwent TV replacement (one had prior valve replacement as a neonate, and one had a prior Starnes single ventricle palliation. Pulmonary atresia was present in 12 patients (44%, 12/27). Augmentation of pulmonary blood flow for patients undergoing biventricular procedures included transannular patch (n = 11), pulmonary homograft (n = 1), pulmonary valvotomy (n = 1), and aorto-pulmonary shunt (n = 2). The GOSE score was 4/4 in all neonates, and 3–3/4 in all infants. The mean follow-up was 6.8 years (range: 1 yr to 15 yrs) and was 93% complete. In-hospital survival was 75% in patients undergoing biventricular procedures. All patients had moderate-severe or severe TR preoperatively. TV z-score was 3.1 ± 1.6 preoperatively. Mean reduction in TV annulus was 10.4 ± 1.3 mm. Mean TR (on a 0–4 scale) was 1.4 ± 0.2 at immediate postoperative assessment and 1.6 ± 0.7 at late follow-up. TR distribution at late follow-up is illustrated in Figure 1. There was a trend towards survival benefit in patients who had better improvement in TR (p = 0.09). Freedom from reoperation was 73.6% at 3.3 years. Survival at 10 years is 71% (Figure 2). All survivors are in NYHA Class I or II.
CONCLUSIONS: Biventricular repair of EA in neonates and young infants is feasible in most circumstances. Long-term follow-up data shows that biventricular repair is durable with good freedom from reoperation and long-term survival for all patients including those with pulmonary atresia.

CF19. Fontan Surgery in Patients with an Interrupted IVC: Guidelines for Optimizing the Hepatic Baffle Design
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BACKGROUND: Single-ventricle patients with interrupted inferior vena cava (IVC) and azygos continuation commonly require a Fontan connection after the Kawashima procedure to reverse the development of pulmonary arteriovenous malformations (PAVMs). However, in a few cases, the design of the hepatic baffle (HB), relative to the existing anatomy, results in an unbalanced hepatic flow distribution (HFD) to the lungs and subsequent recurrence of PAVMs. In this study, we combine virtual surgery and numerical simulations to identify the optimal HB designs for patients with interrupted IVC.

METHODS: Six patients with interrupted IVC and severe PAVMs were separated into two groups. Group 1 (G1: n = 3) patients had a single superior vena cava (SVC), while Group 2 (G2: n = 3) patients had a persistent left SVC (PLSVC). In vivo anatomies were reconstructed from MRI (n = 4) and CT (n = 2). Using a virtual-surgery interface, nine possible HB designs, on average, were generated for each patient. The options considered included various HB-to-SVC offsets, intra and extra-cardiac baffles, and HB-to-azygos and azygos-to-HB connections. HFD was assessed for all options using a fully validated computational flow solver.

RESULTS: For all cases, HFD was very sensitive to the HB-to-SVC offset. For G1 (Figure 1), simply connecting the HB to the Kawashima connection proved dangerous, as even a small left or right offset led to a highly preferential HFD to the associated lung because of the greater momentum carried by the superior return. Best results were obtained with either a Y-shaped HB to evenly split the flow (1 pt), or an HB-to-azygos connection to promote mixing in the Kawashima (2 pts). In G2 (Figure 2), optimal results were obtained by centrally connecting the HB between the SVCs. Options with a biased HB orientation (left or right) led to highly preferential HFD to the associated lung. One major exception was found for one patient who had a significant imbalance in the distribution of the superior return. Specifically, the SVC and right-sided azygos carried 70% of the cardiac output, forcing the hepatic flow (only 10% CO) to the left. This configuration was found to be more like G1 cases, and the optimal solution was a combination azygos-to-HB and Y-graft. This case underscores the importance of pre-operative flow assessment with MRI for characterizing the existing hemodynamics of the connection. Although post-operative MRI data are lacking, the use of these approaches has generally led to increased oxygen saturations testifying for improved HFD.
CONCLUSION: Our experience of surgical planning for six Fontan patients with an interrupted IVC has demonstrated that, by properly characterizing pre-operative anatomy and hemodynamics in these complex patients, a set of simple yet efficient guidelines can be defined to optimize HFD and ultimately minimize the chances of PAVMs.
CF20. Direct Optical Measurement of Intra-Operative Myocardial Oxygenation During Congenital Heart Surgery
Gordon A. Cohen1*, Lester C. Permut1*, Lorilee S.L. Arakaki1, Wayne A. Ciesielski1, D. Michael McMullan1, Andrea R. Parrish1, Kenneth A. Schenkman1
1University of Washington, Seattle, WA; 2Seattle Children’s Hospital, Seattle, WA

OBJECTIVES: To demonstrate use of novel optical technology to measure cellular oxygenation during corrective surgery for congenital heart defects.

METHODS: After heart exposure, measurements of cellular oxygenation were made using a sterile optical probe designed for this study. The optical probe consisted of a bifurcated set of optical fibers with an illuminating ring of fibers surrounding a central set of detection fibers. The probe was placed on the free wall of the right ventricle. Optical spectra from 600 to 840 nm were acquired approximately every 5 minutes, as allowed by the surgical procedure. Cellular oxygenation, determined by myoglobin saturation, was calculated using a multi-wavelength analysis method called multivariate curve resolution. Timing of bypass, aortic cross-clamp, and infusion of cardioplegic solution were recorded along with spectral acquisition for comparison. Length of ICU stay was determined from the medical record.

RESULTS: Figure 1 shows mean cellular oxygenation (n = 7 patients). Baseline cellular oxygenation, measured by myoglobin saturation, was approximately 50 percent just prior to initiation of aortic cross-clamp. Myoglobin oxygenation decreased during cardioplegia, to an average value of approximately 20% (pO2 < 1 mm Hg) at 15 minutes following the first infusion of cardioplegia. Myoglobin oxygenation remained low throughout cardioplegia, and returned toward baseline after discontinuation of bypass, shown at 30 minutes following release of aortic cross-clamp. In four cases cellular oxygenation did not return as quickly to baseline as in the other three cases. Although the number studied is too small for statistical significance, there is a trend toward longer ICU stay for patients with slower cellular oxygen recovery (Table 1). Among the four patients demonstrating slow recovery, the average ICU length of stay was 2.25 days compared with an average stay of 1.33 days for those patients exhibiting rapid cellular oxygenation recovery (p = 0.06). Also, perhaps related is the duration of aortic cross-clamp. The slow recovery group had an average cross-clamp time of 40.1 ± 28.4 minutes, compared with 26.0 ± 8.5 minutes for the fast recovery group (p = 0.34).

CONCLUSIONS: This study demonstrates for the first time that myocyte oxygenation can be measured intraoperatively during cardiac surgery. Cellular oxygenation dropped rapidly following initiation of cardioplegia, and remained low during the aortic cross-clamp period. Cellular oxygenation, as opposed to vascular oxygenation, represents the available oxygen at the cellular level necessary for metabolism and cell viability. Measurement of cellular oxygenation may be useful for improving myocardial preservation. The correlation noted between recovery of oxygenation following reperfusion and recovery of the patient in the post-operative period, while not statistically significant, may indicate that cellular oxygenation during surgery is an important factor for recovery.
CF21. Contemporary Outcomes of Surgical VSD Closure
Brett R. Anderson1, Kristen N. Stevens2, Susan C. Nicolson1, Stephen B. Gruber2, Thomas L. Spray1, Gil Wernovsky1, Peter J. Gruber1
1Children’s Hospital of Philadelphia, Philadelphia, PA; 2University of Michigan, Ann Arbor, MI

BACKGROUND: Given new approaches to intra-cardiac repair of ventricular septal defects (VSD), the purpose of this study was to re-assess characteristics and outcomes of children undergoing surgical repair of simple VSD in a contemporary cohort.

METHODS: We studied a consecutive series presenting at the Children’s Hospital of Philadelphia (n = 285) for surgical closure of simple VSD between 1/1/02 and 12/31/08 in this retrospective chart review. Patients with a concomitant atrial septal defect (ASD), patent ductus arteriosus (PDA), patent foramen ovale (PFO), coarctation of the aorta, or stenotic or regurgitant semilunar valves were excluded. Patients with all other cardiac complex abnormalities, including tetralogy of Fallot and double outlet right ventricle, were excluded.

RESULTS: In our consecutive series, males and females were equally represented (50.9% male, 0.7% ambiguous genitalia) and the majority of patients were Caucasian (61%), followed by African American (16.5%), Hispanic (7%), and Asian (3.5%). Indications for operation included heart failure/failure to thrive without pulmonary hypertension (CHF/FTT, 69.5%), right ventricular obstruction/aortic insufficiency/double chamber right ventricle (RVOTO/AI, not TOF 10.9%), CHF/FTT and RVOTO (9.9%), pulmonary hypertension with or without heart failure (PHTN, 7.7%), and dilated ventricle without heart failure (DV, 1.1%). Anatomic type was as follows: 8.4% single cono-septal (Type I), 77.9% single conoventricular (Type II), 1.8% single inlet/canal type (Type III), 2.8% single muscular (Type IV), and 9.1% multiple. 15.1% were associated with PDA, 33.7% with PFO, and 22.8% with ASD. Patients operated on for FT/CHF without PHTN tended to be significantly younger (Median (M) = 106 days, Standard deviation (SD) = 39%) than patients operated on for RVOTO/AI (M = 1448 days, SD = 1317), PHTN (M = 152 days, SD = 773), or DV (M = 476 days, SD = 917) (P < 0.0001). Neither operative indication nor age at surgery was significantly associated with underlying condition or product of multiple gestations. Post-operative days of hospitalization was significantly associated with time in the operating room (P < 0.0001), younger age (P = 0.03), increasing pre-operative ventilator time (P < 0.0001), and presence of a major co-morbid condition (P = 0.026). Adverse outcome (reoperation, heart block requiring permanent pacer, arrest, ECMO, and death) occurred in 5.3% of patients. Cross-clamp time (AXC), total pre-operative size of VSD on TTE, and pre-operative ventilation time significantly predicted the occurrence of several adverse outcomes in separate multivariable models, including major adverse outcomes, pleural effusion, chest tube placement, arrhythmia, (including RBBB), arrest, and significant bleeding. AXC was the strongest predictor.

CONCLUSION: For children undergoing simple VSD closure without underlying genetic or co-morbid conditions, hospitalization was short and major adverse outcome infrequent. AXC is an important predictor though may be a surrogate for other markers. However, the natural course of VSD repair, particularly in children with underlying or co-morbid conditions, differs greatly, and parents should be counseled accordingly.
OBJECTIVE: As in adult practice, surgical site infections (SSIs) following pediatric cardiac surgery are not uncommon, can be costly, and soon un-reimbursable.

METHODS: Following our institutional experience of unacceptably high SSI rates (~3–6%), a multi-disciplinary quality improvement initiative was created to review published data on SSI rates and risk factors following pediatric cardiac surgery. Key Drivers were identified (Figure 1) and outcome measures stipulated using CDC criteria for SSI counts. Using Failure Mode and Effects Analysis, a number of interventions were implemented over an 8 month period and data were tracked using control charts.

RESULTS: From Jan. 2002 until Dec. 2005, 1393 cases (1001 open and 392 closed) were performed at our institution with an SSI incidence rate of 3%. Starting in Jan. 2006, 11 interventions, with level II and III reliability, were carried out with 1 to 5 PDSA cycles per intervention strategy, based on 8 Key Drivers (Figure 1). With the institution of these quality improvement efforts, our SSI rate decreased to less than 1% among 1299 cases (933 open and 366 closed) performed between Jan 2006 to Dec 2009 (1 single SSI in an asplenic patient following an elective procedure). Based on these results, a bundle has been created and implemented as routine part of our organizational practice.

CONCLUSIONS: SSIs following pediatric cardiac surgery can be nearly completely eliminated using quality improvement methodology.

FIGURE 1 Design Changes/Interventions

Evidence based antibiotic use (LOR III): Infused 0–60 minutes before incision, at time of surgeon marking operative site. Routine intraoperative re-dosing based on CPB duration. Modified regimen for open-chest cases. Discontinue antibiotics 48 hours after chest closure.

Key Drivers Appropriate Peri-operative Antibiotics

High-risk patients screened for MRSA prior to surgery and treated accordingly with antibiotics. (LOR III)

Targeted MRSA screening

Aim

Patients started on zinc prior to select procedures. Focused effort on meeting patients’ specific nutritional goals.

Maintain Blood Glucose <200mg/dl during first 48 hours (Modified Insulin protocol) (LOR III).

Peri-operative nutritional therapy

Successful Glycemic Control

We will decrease incidence of surgical site infections (SSI) from ~3% to <1% by June 2008.

Violation of the wound covering closely monitored for the first 48 hours following surgery. Maintenance of Chlorhex prep for 48 hrs. “Heart sticker” to monitor wound coverage integrity. Sterile technique for periop TTE. (LOR II & III)

Single dose of steroids given preop for CPB cases only. Early intervention and/or initiation of support in those with instability and being considered for “steroid” supplementation. (LOR III)

Access and Maintenance of Accurate Baseline and Follow-up data

Avoidance of Periop Steroid Use

Maintenance of consistent wound sterility

Overall Outcome: CT Surgery SSI reduced to ≤1%

Create and capture “Follow-up” data with outpatient surveillance at 30 days post index surgery. (LOR II)

Comprehensive case-based risk analysis

Design process for review of all “captured” SSI; retrospective and prospective (LOR III)
OBJECTIVES: The bidirectional cavopulmonary anastomosis (BCPA) has been performed without cardiopulmonary bypass (CPB) for some single ventricle heart defects. Limited data is available for the outcomes of off-pump BCPA in infants with hypoplastic left heart syndrome (HLHS). The purpose of this study is to determine the early outcomes for stage II palliation for HLHS without CPB.


RESULTS: 75 infants had a modified Norwood procedure, 65 with right ventricle to pulmonary artery conduit, 10 with aortopulmonary shunt, 2 with atrioventricular valve repair, and 3 with extracorporeal membrane oxygenation (ECMO). The median age of surgery was 4 months (range: 0–12 months) and median weight was 2.5 kg (range: 1.0–4.5 kg). There were no conversions to CPB when off-pump BCPA was attempted. There were no hospital deaths. Median ventilation duration was 10 hours (range: 6–18 hours) and length of stay was 6 days (range: 4–9 days). Follow-up was available on all infants at a median duration of 17 months (range: 4–43 months) with no unplanned reinterventions.

CONCLUSIONS: BCPA without the use of CPB can be performed safely and with low mortality for selected infants with HLHS. Mid- to long-term outcomes remain to be determined.
7 to 25 mmHg in ASO group, 9 to 49 mmHg in Rastelli group, and 6 to 16 mmHg in RT group. Preoperative presence of pulmonary stenosis and follow-up time were the principal determinants of late RVOT obstruction (gradient >30 mmHg).

CONCLUSIONS: Careful attention to anatomic features dictates optimal surgical strategy and will enhance outcomes. Follow-up results of ASO with VSD-to-pulmonary artery baffle and root translocation indicate better hemodynamic performance of the reconstructed biventricular outflow tracts. Because “time” is a principal predictor of late LVOT and RVOT obstruction, strict follow-up is mandatory.
**16. What Happens (But Is Not Reported) in the Cardiac OR?**

**Megan Miller, Traci Ashcraft, Aimee Gardner, Peter Manning, Pirooz Eghtesady**

*Cincinnati Children’s Hospital Medical Center, Cincinnati, OH*

**DISCUSSANT: DOUGLAS E. WOOD**

**OBJECTIVE:** Cardiac surgical procedures, by nature, are complex and require coordinated action of a multi-disciplinary team. This creates a milieu for potential near misses that may be the substrate for subsequent morbidity or mortality.

**METHODS:** Beginning in 2008, we began a quality improvement initiative to capture unanticipated events and any near-misses in our operating room (OR), with the goal of ultimately decreasing the rate of occurrence of such events. During a 3-month trial period, using a pre-/post-briefing methodology, we began recording all events occurring in our OR. This led to identification of nine recurrent patterns of events: patient instability, physical injury to the patient, communication failure, change of plan, medication-, blood product-, equipment misuse or malfunction-related, access related, and other/misc. The process was then modified using a recall tool as well as real-time capture of events. Through a multi-disciplinary effort, comprehensive monthly review of data was carried out along with Failure Mode and Effect Analysis of individual activities and system processes. Epochs of events were defined as pre-cardiopulmonary bypass (CPB), during CPB and post-CPB. Other data captured included case complexity, discipline involved, deviation of standard of care, timely recognition and specific interventions. Data was analyzed using quality improvement analytic tools including P-Charts and Pareto distributions.

**RESULTS:** With systematic capture, event rates increase from ~30% to 60% of all procedures. In most of these cases (63%), only a single event was identified. Two categories, patient instability and equipment related events, accounted for over half of all events (29.7% and 26.3%, respectively). Among the equipment category, a recurrent pattern consisting of 12 sub-areas were identified and studied further. Certain disciplines were more involved with particular events and during distinct period of the procedure (Table). Further, in open-heart cases, 42% of the events occurred pre-bypass, while bypass and post-bypass periods accounted for 23% and 35% of the events. The largest contributors to events (and percentages) for the pre-, during and post-bypass periods were communication failure (12%), equipment related (12%), and patient instability (17%), respectively.

<table>
<thead>
<tr>
<th>Bypass Status vs. Discipline (% of Total Complications)</th>
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</thead>
<tbody>
<tr>
<td>Pre Bypass (41.6%)</td>
</tr>
<tr>
<td>Anesthesia</td>
</tr>
<tr>
<td>Blood Bank</td>
</tr>
<tr>
<td>Perfusion</td>
</tr>
<tr>
<td>Nursing</td>
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<tr>
<td>Surgeon/PA</td>
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<tr>
<td>Cardiology</td>
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<tr>
<td>Pharmacy</td>
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<tr>
<td>Other</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** A systematic approach to recording events in the operating room reveals important patterns of events. Majority of these events are amenable to system interventions and process design changes, which in turn could lead to a safer OR environment.
17. Endovascular Versus Open Elephant Trunk Completion for Extensive Aortic Disease
Eric E. Roselli\textsuperscript{1}, Sreekuman Subramanian\textsuperscript{1}, Jonathon Anderson\textsuperscript{1}, Edward Nowicki\textsuperscript{1}, Roy Greenberg\textsuperscript{1}, Lars G. Svensson\textsuperscript{1}, Bruce W. Lytle\textsuperscript{1}
\textsuperscript{1}Cleveland Clinic, Cleveland, OH; \textsuperscript{2}Leipzig Heart Center, Leipzig, Germany
DISCUSSANT: D. CRAIG MILLER

BACKGROUND: Endovascular stent grafting is increasingly being used to treat extensive thoracic aortic disease but little data exists to support this indication. The objective of this study was to compare in-hospital morbidity and mortality, and long-term survival between patients undergoing endovascular or open approaches to second stage elephant trunk completion.

METHODS: Between August 1993 and January 2009, 197 patients have undergone second stage elephant trunk completion using an endovascular (n = 73) or open surgical (n = 124) approach. Data was collected by chart review, inquiry of the social security death index, and for endovascular patients, regularly scheduled computed tomography (at 1, 6, 12 months and annually) with complete follow-up in 92%. Multivariable logistic regression was performed to identify factors associated with treatment selection and propensity matching was performed for fair comparison.

RESULTS: Endovascular patients were older, more symptomatic (>NYHA score), and were more likely to have preoperative atrial fibrillation than open surgical patients. Overall hospital death was 5% (6.8% endovascular vs 4.4% open, p = 0.52). There was no difference in bleeding (6%), stroke (3%), respiratory failure (11%), renal failure (4%), or permanent leg weakness (2%) between groups. Overall survival at 6 months, 1 year and 5 years was 90%, 89%, and 75%, respectively (Figure). Survival and major morbidity did not differ between groups before or after propensity matching (46 pairs). However, endovascular patients had shorter postoperative length of stay (9.6 ± 13 vs 12.9 ± 9 days, p < 0.001) and received less blood products (6 ± 9 vs 15 ± 8 units, p = 0.004) than open patients, and this difference was maintained in the adjusted analysis.

In follow-up of endovascular patients there were 25 endoleaks detected (1 type I, 22 type II, 2 type III) including 5 which required reintervention. Twenty-two (30%) endovascular patients underwent late aortic reoperation (17 endovascular, 5 open) on the treated segment (n = 9), distal to the treated segment (n = 10), or proximal to the treated segment (n = 3).

CONCLUSIONS: Short- and long-term outcomes are similar for endovascular or open approaches to elephant trunk completion despite the endovascular approach being applied to older and more symptomatic patients. Endovascular elephant trunk completion is associated with shorter hospital stay and reduced need for blood transfusion, but patients requiring extensive aortic repair are at late risk for aortic reoperation.
18. Fate of the Esophagogastric Anastomosis
Cleveland Clinic, Cleveland, OH
DISCUSSANT: FARZANEH F.B. BANKI

BACKGROUND: The long-term effects of gastroesophageal reflux at the esophagogast-ric anastomosis following esophagectomy are unknown. Objectives of this study were to evaluate histology of the esophagogastric anastomosis following esophagectomy, determine time trends of histologic changes, and identify factors influencing those findings.

METHODS: Two hundred thirty-one patients underwent 468 endoscopic biopsies a median of 3.5 years following esophagectomy. Mean age was 59 ± 12 years; 74% (171) were male, 78% (179) had esophagectomy for cancer, 13% (30) with chemoradiotherapy, and 11% (25) had prior anti-reflux surgery. The anastomosis was 20 cm (median) from incisors, and 59% (276) of biopsies were done when patients were receiving anti-reflux medications. Histopathology was characterized as normal, findings consistent with reflux (inflammatory, reactive, hyperplastic or regenerative changes), cardia mucosa, intestinal metaplasia (IM) and dysplasia. Repeated-measures nonlinear time trend analysis and multivariable analyses were used.

RESULTS: Normal mucosa and reflux changes were relatively constant at 5% and 91% at 10 years after esophagectomy, respectively (Figure). Reflux changes were greater in patients not taking anti-reflux medication and in those with a lower anastomosis. Cardia mucosa was relatively constant at 20% across time, whereas intestinal metaplasia steadily increased from 4% at 5 years to 16% at 10 years (Figure). No variable except passage of time was predictive of intestinal metaplasia (P > .15). No patient progressed to dysplasia or cancer during the study.

CONCLUSIONS: The esophagogastric anastomosis is subject to reflux, and histopathologic reflux changes are common. Anti-reflux medication and high anastomosis reduce these changes. Cardia mucosa is common, and intestinal metaplasia increases slowly with time. Progression to dysplasia and cancer is predicted to be uncommon. However, surveillance of esophagogastric anastomoses with a “Barrett-type” esophagoscopy and biopsy protocol is recommended, particularly with a low intra-thoracic anastomosis.
OBJECTIVES: The incidence of atrial fibrillation (AF), doubles with each decade after the age 50 and is associated with decreased survival and increased morbidity. Elderly patients are especially vulnerable since they usually have high CHADS score and significantly higher risk of bleeding while on warfarin, therefore, interventions to ‘cure AF’ are of utmost importance in the aging patient. The purpose of this study was to explore the impact of the surgical ablation procedure on elderly patients presenting for cardiac surgery who also experienced AF.

METHODS: We identified 44 patients aged 75 presented for valve surgery or CABG and underwent surgical ablation for AF; they were matched to patients ≥75 years (n = 36) who presented for cardiac surgery, were experiencing AF and did not receive a surgical ablation procedure. Patients were matched on Euroscore and operative risk, status of operation and by controlling for CABG and or valve surgery. Chi square analysis, t-test and Kaplan-Meier survival analysis were used to identify group differences. The Social Security and the National Death Indexes were searched for patient deaths.

RESULTS: There were no significant differences between groups on selected preoperative characteristics. The average age for both groups was 79.90 (±3.22) years, the average EuroSCORE was 9.33 (±2.44). None of the STS measured perioperative outcomes showed to be statistically significant (Table 1). At 24 months for the ablation group, 80% of pts were in sinus rhythm, and 30% were on warfarin, when in half of them the indication was unrelated to AF. No strokes and only 2 major bleeding events with no deaths related were documented for this group. Long-term survival analysis demonstrated that patients in the ablation group experienced better long-term survival (p = .01) (Figure 1).

CONCLUSIONS: Surgical ablation for patients aged 75 years and older did not add operative risk and may be related to improved long-term survival post surgery. Patients should not be excluded from surgical ablation based on aged and associated risk only. Consideration should be given to performing surgical ablation on patients aged 75 years and older who present for cardiac surgery and are experiencing atrial fibrillation.

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**Table 1:** Patient Demographics by Group

<table>
<thead>
<tr>
<th>Patient Demographics by Group</th>
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</thead>
<tbody>
<tr>
<td><strong>Surgical Ablation Group</strong></td>
</tr>
<tr>
<td><strong>Non Ablation Group</strong></td>
</tr>
<tr>
<td><strong>P</strong></td>
</tr>
<tr>
<td>Mean Age (STI)</td>
</tr>
<tr>
<td>Mean EuroSCORE (ES)</td>
</tr>
<tr>
<td>Type of Surgery (%)</td>
</tr>
<tr>
<td>Male Gender (%)</td>
</tr>
<tr>
<td>30 day mortality (%)</td>
</tr>
<tr>
<td>Deep SEPSI (%)</td>
</tr>
<tr>
<td>Persistent VT (%</td>
</tr>
<tr>
<td>Perioperative bleeding (%)</td>
</tr>
<tr>
<td>Prolonged ventilation (%)</td>
</tr>
<tr>
<td>Intra/postop sepsis (%)</td>
</tr>
<tr>
<td>Readmission &lt; 30 days</td>
</tr>
</tbody>
</table>

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**Figure 1:** Survival of Patients ≥75 years Undergoing Surgical Ablation for Atrial Fibrillation compared to Patients >75 years who did not Undergo Surgical Ablation for Atrial Fibrillation.
BACKGROUND: Current VATS training models rely on animals or mannequins to teach procedural skills. These approaches do not have inherent teaching/testing capability, and are further limited by high cost, failure to reflect known variations in human anatomy, and inability to provide repetition. To overcome these limitations, we hypothesized that VATS right upper lobe resection (VRUL) could be “performed” in a virtual reality environment with commercially available software.

METHODS: A commercial anatomy explorer (Maya® graphic models of the chest, right lung, hilar structures, and mediastinum) and simulation engine were adapted. Design goals included: 1) freedom of port placement for camera and instruments; 2) accurate anatomic representation, incorporating well known anatomic variants; 3) anatomy teaching and testing modes; 4) haptic feedback for the dissection of hilar structures; 5) the ability to perform the anatomic divisions necessary for a VRUL resection; and 6) a portable PC-based platform to host the simulation.

RESULTS: Pre-existing commercial anatomical models did not provide sufficient surgical detail; extensive modeling modifications were required. VRUL simulation initiates with a random combination of pre-defined hilar vein and artery anatomic variations. The student proceeds in either a teaching or testing mode. A knowledge database currently includes 12 anatomic identifications and 20 high-yield lung cancer learning points. The “patient” is presented in the left lateral decubitus position. After an initial camera port is chosen, the endoscopic view is displayed, and the thoracoscope is manipulated via the haptic input device (Figure 1). Thoracoscope port can be relocated at any time; additional ports are placed using an external “operating room” view. Unrestricted endoscopic exploration of the thorax is allowed, with the ability to manipulate lung into 3 predefined positions. Endoliner allows for hilar dissection (Figure 2) and a virtual stapling device can be used to divide the structures. At the end of the simulation the user's performance is reported.

* Samson Resident Prize Essay
* WTSA Member
**CONCLUSIONS:** A virtual reality task trainer can overcome deficiencies of existing training models. Performance scoring is being validated, as we assess this simulator for cognitive and technical surgical education.

**CONCLUSIONS:** Off-pump coronary artery bypass confers lower morbidity with equivalent mortality and patient costs compared to conventional on-pump coronary artery bypass among elderly patients. Off-pump coronary artery bypass should be considered an acceptable alternative to conventional bypass for myocardial revascularization in elderly patients.
Table 1

<table>
<thead>
<tr>
<th>Outcome</th>
<th>CABG (n = 1,589)</th>
<th>OPCAB (n = 404)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packed Red Blood Cells (units)</td>
<td>2.0 ± 1.7</td>
<td>1.6 ± 1.0</td>
<td>0.05</td>
</tr>
<tr>
<td>Hospital LOS (days)</td>
<td>12.39 ± 11.1</td>
<td>12.20 ± 10.6</td>
<td>0.75</td>
</tr>
<tr>
<td>Postoperative LOS (days)</td>
<td>9.52 ± 10.5</td>
<td>9.0 ± 10.0</td>
<td>0.41</td>
</tr>
<tr>
<td>Major Complication</td>
<td>320 (20.1%)</td>
<td>63 (15.6%)</td>
<td>0.04</td>
</tr>
<tr>
<td>Operative Mortality</td>
<td>81 (5.1%)</td>
<td>24 (5.9%)</td>
<td>0.53</td>
</tr>
<tr>
<td>Total Cost ($)</td>
<td>36,755 ± 34,650</td>
<td>35,031 ± 34,635</td>
<td>0.43</td>
</tr>
</tbody>
</table>

BACKGROUND: Statins may have pleiotropic effects, independent of their ability to reduce lipid levels. Recent data has suggested that statins improve early survival and cardiovascular outcomes after coronary artery bypass graft surgery. The effectiveness of statin therapy in normolipidemic cardiac surgery patients is presently unclear.

METHODS: We evaluated 3056 consecutive patients who underwent cardiac surgery between April 2004 and April 2009. Perioperative statin therapy was defined as continued treatment both before (at least 6 months) and after the index surgery (included as a discharge medication). Hyperlipidemia (HL) was defined as a total cholesterol level >200 within 6 months prior to surgery. Four groups were analyzed: (i) statin-un-treated normolipidemics, NL− (n = 1032); (ii) statin-treated normolipidemics, NL+ (n = 206); (iii) statin-un-treated hyperlipidemics, HL− (n = 638); (iv) statin-treated hyperlipidem-ics, HL+ (n = 1160). Adjusted hazard ratios (aHR) accounted for patient demographics, known preoperative cardiac risk factors, surgical characteristics and concomitant medications. Mortality was ascertained by retrospective database review and the Social Security Death Index. Survival curves were compared using the log-rank test.

RESULTS: Mean follow-up was 2.2 years. Crude rates of 30-day mortality were 3.0% (32/1052), 0% (0/206), 8.0% (51/638), and 0.7% (8/1160) for NL−, NL+, HL− and HL+, respectively. Overall all-cause crude mortality rates were 9.6% (101/1052), 3.9% (8/206), 17.2% (110/638) and 6.5% (75/1160) for NL−, NL+, HL− and HL+, respectively (see Figure 1 for survival curves). Compared to NL−, the adjusted HRs for all-cause mortality were 0.29 (0.14, 0.62), 1.09 (0.80, 1.48), 0.49 (0.35, 0.69) for NL+, HL− and HL+, respectively. Statin therapy in normolipidemic patients undergoing cardiac surgery independently reduced overall all-cause mortality (aHR 0.34 [0.16–0.71], P = 0.004, see Figure 2).

CONCLUSIONS: Perioperative statin therapy is associated with reduced long-term mortality in patients undergoing cardiac surgery, irrespective of baseline lipid status. This clinical evidence suggests that the beneficial effects of statins may extend beyond their lipid-lowering ability.
11:10 am – 12:00 pm  C. WALTON LILLEHEI POINT/COUNTERPOINT SESSION, Hacienda Ballroom
Attending Surgeons Should Be Held to an 80-Hour Workweek
Moderator: Michael S. Mulligan
Pro: Scott A. Shappell
Con: Irving L. Kron

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

12:30 pm – 2:00 pm  FAMILY LUNCHEON, Herb Garden & Recreation Field

7:00 pm – 10:00 pm  KIDS & TEENS BANQUET, Garden Room (AGES 5–18)

7:00 pm – 11:00 pm  PRESIDENT’S RECEPTION AND BANQUET (Black Tie Optional)
Reception: Hacienda Foyer and Plaza
Banquet: Hacienda Ballroom
W ESTERN T HORACIC S URGICAL A SSOCIATION

C ONSTITUTION AND B YLAWS

THE WESTERN THORACIC SURGICAL ASSOCIATION

Founded as The Samson Thoracic Surgical Society

C ONSTITUTION

A RTICLE I. N AME
The name of this Corporation is The Western Thoracic Surgical Association (hereinafter “the Association”).

A RTICLE II. P URPOSES
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.

A RTICLE III. M EMBERSHIP

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 four types of membership: Active, Senior, Honorary and Charter, as defined in the By-Laws.

Ojai Valley Inn, Ojai, California 36TH ANNUAL MEETING

Section 3.
A candidate for active membership must:

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

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

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

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

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

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

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

Section 6.
The privilege of continuing membership shall be subject to adherence to the provisions of the Constitution and By-Laws of the Association.
ARTICLE IV. 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 V. 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 VI. 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 VII. AMENDMENTS

Proposed amendments to the Constitution shall be submitted in writing to the members at least 30 days prior to a regular business meeting at which the proposed amendments shall be presented to the membership. Notice of such proposed amendments shall be mailed to each member at least thirty days prior to the next regular meeting at which the vote shall be taken. An affirmative vote of two-thirds of the members present is required to adopt an amendment to the Constitution.
ARTICLE I. APPLICATION FOR ACTIVE MEMBERSHIP
Section 1. Applicant.

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

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

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

Section 2. Candidate.

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

Section 3. Election to Membership.

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

Section 4. Notice of Election.

Every newly elected member shall be furnished by the Secretary with an official notice of election, accompanied by a copy of the Constitution and By-Laws. A Certificate of Membership signed by the President, the Secretary, and the Chairman of the Membership Committee bearing the Seal of the Association shall be presented to the newly elected members at the first session of the next regular meeting immediately following their election.

ARTICLE II. MEMBERS
Section 1. Active Members.

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

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

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

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

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

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

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

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

**Section 2. Senior Members.**

Senior membership shall be obtained by written request and Council approval for members retired from active practice at age 60 or shall be automatic at age 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.

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**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 CARPOVASCULAR SURGERY shall be an honorary member of the Association and ex-officio member of the Council without vote.

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

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

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

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

ARTICLE III. OFFICERS

Section 1. Nomination and Election.
Candidates for election as Vice President, Secretary, Treasurer and 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) members 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 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.

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.

ARTICLE X. GUESTS

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

Section 4. Participation of Guests.
Guests shall be expected to withdraw when the business of the Association is to be conducted, as an announcement by the President.

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

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

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

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

Revised: June 1999
June 2000
June 2001
June 2007
June 2009

Guidelines for Expert Witness Testimony

The Western Thoracic Surgical Association joins with other specialty organizations in emphasizing the obligation of objectivity when its members respond to requests to serve as expert witnesses in the judicial system. The perceived need for a guideline outlining policies and standards for expert testimony was recognized by the Council following a report by the Association’s Ethics Committee of a complaint against a member. Within the legal system the definition of an “expert” is far less stringent than what the medical profession might acknowledge. In a trial the attorneys introduce the qualifications of their experts and their testimony generally embodies relevant facts, the expert’s knowledge and experience, and the expert’s best judgment. Attacks on the credibility of an expert witness are termed impeachments and tactics can be employed during cross-examination to question the expert’s qualifications. It is this issue that the Association wishes to specifically address, the qualifications of an expert. An expert witness should have current experience and ongoing knowledge about the areas of clinical medicine in which they are testifying as well as familiarity with practices during the time and place of the episode being considered as well as the circumstances surrounding the occurrence. The expert witness should be an impartial practicing physician. He or she must not become an advocate or a partisan in a legal proceeding. Truthfulness is essential and misrepresentation or exaggeration of facts or opinions in an attempt to establish an absolute right or wrong may be harmful both to the individual parties involved and to the profession as a whole. The expert’s view 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
Abdul R. Al-Shamma, Kilauea, Hawaii
Buford H. Burch, Walnut Creek, California
Douglas W. Cardozo, Santa Rosa, California
P. Richard Carter, Las Vegas, Nevada
Joseph B. Ford, Jr., Fresno, California
Carl J. Impellitteri, Mesilla Park, New Mexico
U. Scott Page, Portland, Oregon
Harry G. Parsons, Weimar, California
Theodore Sadler, Jr., Grand Junction, CO
John M. Salyer, Indian Wells, California

36TH ANNUAL MEETING
Ojai Valley Inn, Ojai, California

PAST PRESIDENTS

David J. Dugan
1974-1977

Bertrand V. Meyer
1980-1981

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
1988-1989

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
WESTERN THORACIC SURGICAL ASSOCIATION

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. Dutty
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

Ojai Valley Inn, Ojai, California

36TH ANNUAL MEETING

David A. Fullerton
2008–2009
In 1984, on the tenth anniversary of its founding, the Samson Thoracic Surgical Society changed its name to the Western Thoracic Surgical Association in order to better describe its scope and to gain professional recognition as the major surgical specialty organization it had become. Thereafter, the Council sought a means to perpetuate the name of Paul C. Samson, the patron and inspiration of the society during its early years. Mindful of Paul's legendary warmth and generosity to young surgeons and his lifelong dedication to both graduate and postgraduate surgical education, it was decided to link his name with the activities of the Association that pertained to these interests and in 1985 the Samson Endowment Fund was created.

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

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

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>George E. Miller, Jr.</td>
<td>Pebble Beach, CA</td>
</tr>
<tr>
<td>1997</td>
<td>Edward A. Smeloff</td>
<td>Sacramento, CA</td>
</tr>
<tr>
<td>1999</td>
<td>Jack M. Matloff</td>
<td>Los Angeles, CA</td>
</tr>
<tr>
<td>2002</td>
<td>Albert Starr</td>
<td>Portland, OR</td>
</tr>
<tr>
<td>2004</td>
<td>Leonard L. Bailey</td>
<td>Loma Linda, CA</td>
</tr>
<tr>
<td>2005</td>
<td>Bruce A. Reitz</td>
<td>Stanford, CA</td>
</tr>
<tr>
<td>2007</td>
<td>W. Gerald Rainer</td>
<td>Denver, CO</td>
</tr>
<tr>
<td>2009</td>
<td>Richard P. Anderson</td>
<td>Seattle, WA</td>
</tr>
<tr>
<td>2010</td>
<td>John A. Hawkins</td>
<td>Salt Lake City, UT</td>
</tr>
</tbody>
</table>

### DONALD B. DOTY EDUCATIONAL AWARD

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.

<table>
<thead>
<tr>
<th>Year</th>
<th>Institution</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>LDS Hospital</td>
<td>Salt Lake City</td>
</tr>
<tr>
<td>2006</td>
<td>James I. Fann</td>
<td>Stanford, CA</td>
</tr>
<tr>
<td>2007</td>
<td>Gordon A. Cohen</td>
<td>Seattle, WA</td>
</tr>
<tr>
<td>2008</td>
<td>John D. Mitchell</td>
<td>Aurora, CO</td>
</tr>
<tr>
<td>2009</td>
<td>Robbin G. Cohen</td>
<td>Los Angeles, CA</td>
</tr>
<tr>
<td>Year</td>
<td>Location</td>
<td>President</td>
</tr>
<tr>
<td>------</td>
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<td>--------------------</td>
</tr>
<tr>
<td>1975</td>
<td>The Santa Barbara Biltmore Hotel, Santa Barbara, California</td>
<td>David J. Dugan, Oakland, California</td>
</tr>
<tr>
<td>1976</td>
<td>The Banff Springs Hotel, Banff, Alberta, Canada</td>
<td>David J. Dugan, Oakland, California</td>
</tr>
<tr>
<td>1978</td>
<td>Hotel Del Coronado, Coronado, California</td>
<td>John E. Connolly, Irvine, California</td>
</tr>
<tr>
<td>1979</td>
<td>Sun Valley Lodge, Sun Valley, Idaho</td>
<td>Norman E. Shumway, Stanford, California</td>
</tr>
<tr>
<td>1982</td>
<td>Hotel del Coronado, Coronado, California</td>
<td>Paul A. Ebert, San Francisco, California</td>
</tr>
</tbody>
</table>
PAST MEETING HIGHLIGHTS

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

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

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

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

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

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

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

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

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

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

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

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

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

1999  The Resort at Squaw Creek, Olympic Valley, California
President  Kent W. Jones  Salt Lake City, Utah
Secretary  Vaughn A. Starnes  Los Angeles, California
Local Arrangements Chairman  J. Edward Okies  Portland, Oregon
Samson Resident Prize Essay Award  Leonard Y. Lee  New York, New York

2000  The Orchid at Mauna Lani, The Big Island, Hawaii
President  Bradley J. Harlan  Sacramento, California
Secretary  Vaughn A. Starnes  Los Angeles, California
Local Arrangements Co-Chairs  Paul B. Kelly and Linda M. Kelly  Fair Oaks, California
Samson Resident Prize Essay Award  Murray H. Kwon  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

2003  La Costa Resort, Carlsbad, California
President  Edward D. Verrier  Seattle, Washington
Secretary  R. Scott Mitchell  Stanford, California
Local Arrangements Chairman  Douglas E. Wood  Seattle, Washington
Samson Resident Prize Essay Award  Albert J. Chong  Seattle, Washington

2004  Wailea Marriott, Wailea, Maui, Hawaii
President  Vaughn A. Starnes  Los Angeles, California
Secretary  R. Scott Mitchell  Stanford, California
Local Arrangements Chairman  Winfield J. Wells  Los Angeles, California
Samson Resident Prize Essay Award  Frederick A. Tibayan  Stanford, California

2005  Fairmont Empress Hotel, Victoria, BC, Canada
President  Steven W. Guyton  Seattle, Washington
Secretary  John A. Hawkins  Salt Lake City, Utah
Local Arrangements Chairman  W. R. Eric Jamieson  Vancouver, BC, Canada
Samson Resident Prize Essay Award  Matthew G. Whitten  Salt Lake City, Utah
Donald B. Doty Award  LDS Hospital  Salt Lake City, Utah

2006  Sun Valley Resort, Sun Valley, Idaho
President  R. Scott Mitchell  Stanford, California
Secretary  John A. Hawkins  Salt Lake City, Utah
Local Arrangements Chairman  Thomas A. Burdon  Stanford, California
Samson Resident Prize Essay Award  T. Brett Reece  Charlottesville, VA
Donald B. Doty Award  James I. Fann  Stanford, California
Norman E. Shumway Award  John A. Hawkins  Salt Lake City, Utah
PAST MEETING HIGHLIGHTS

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

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

2009  The Fairmont Banff Springs, Banff, Canada
President         David A. Fullerton  
                 Aurora, Colorado
Secretary         Thomas A. Burdon  
                 Palo Alto, California
Local Arrangements Chairman     Michael J. Weyant  
                 Aurora, Colorado
Samson Resident Prize Essay Award     David C. Mauchley  
                 Denver, Colorado
Donald B. Doty Award       Robbin G. Cohen  
                 Los Angeles, California
Norman E. Shumway Award     Anthony D. Caffarelli  
                 Stanford, California

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. Buchberg, MD, Los Angeles, CA
Before and After – Myocardial Preservation
             Shahbudin Rahimtoola, MD, Los Angeles, CA

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

1983  The Thymus: Master Gland of the Immune System  
Robert A. Good, MD, PhD, New York, NY
The Mediastinal Imaging Techniques  
James B.D. Mark, MD, Stanford, CA
Surgical Approaches to the Mediastinum  
Philip C. Jolly, MD, Seattle, WA
Surgical Oncology of Mediastinal Tumors  
John R. Benfield, MD, Los Angeles, CA

1984  The Surgical Management of Aortic Dissection  
Paul A. Ebert, MD, San Francisco, CA
Routine Use of the Internal Mammary Artery Conduit for Coronary Bypass:  
Late Clinical and Angiographic Follow-Up Studies  
U. Scott Page, MD, Portland, OR
Cardiac Trauma  
F. William Blaisdell, MD, Sacramento, CA
Physiologic Principles of Coronary Blood Flow as Applied to the Cardiac  
Surgical Patient  
Julien J.E. Hoffman, MD, San Francisco, CA

1985  Cardiac Support Devices  
J. Donald Hill, MD, San Francisco, CA
Cardiac Transplantation – Present Status and Future Prospects  
Jack G. Copeland, III, MD, Tucson, AZ
Will the Real Cass Study Stand up?  
Richard P. Anderson, MD, Seattle, WA

1986  Cell Membranes – Implications on Cancer Control  
Jonathan Singer, MD, San Diego, CA
Pathophysiology of Left Ventricular Dysfunction in a Surgical Perspective  
Kirk Peterson, MD, San Diego, CA

1987  Anti-Platelet Therapy – Practical Clinical Strategies for Bypass Graft  
Patients  
Laurence A. Harker, MD, La Jolla, CA
Platelets, Vasospasm, and Aspirin – Thoughts on the Pathogenesis and  
Prevention of Arteriosclerosis  
Laurence A. Harker, MD, La Jolla, CA

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. Kouchookos, 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, Stanford, CA

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

2008  Allogeneic Stem Cell Transplantation for Malignant and Nonmalignant
      Hematologic Disorders
      Rainer F. Storb, Seattle, Washington

2009  Cardiac Surgery and Translational Research—A Critical Partnership in
      Critical Condition
      Francis G. Spinale, Charleston, South Carolina
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Unlike other organizations to which you make philanthropic contributions, the Thoracic Surgery Foundation for Research and Education works directly for your specialty. TSFRE supports research and education initiatives to increase knowledge and enhance treatment of patients with cardiothoracic diseases; develops the skills of cardiothoracic surgeons as surgeon-scientists and health policy leaders; and, strengthens society’s understanding and trust in the profession.

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If you have not yet made your annual gift to TSFRE, now is the time! If you make an annual gift of appreciated stocks, bonds or mutual funds, you avoid capital gains tax and earn an income tax deduction by donating rather than selling these assets. This may be better for you than a gift of cash.

If you have been thinking of making a charitable contribution to TSFRE, this may be the time to consider a planned gift. Often, this type of giving enables an individual to give a larger gift at a cost that is actually lower than if the gift were to be made outright. You may also find that planned giving enables you to meet other personal financial goals while making significant charitable gifts.

You may give to TSFRE through a revocable instrument, such as a bequest in your will, or through an irrevocable instrument like a charitable lead trust or a charitable remainder trust. You may also give through a life insurance policy or your retirement plan.

For more information about your annual gift or a deferred gift, contact the Thoracic Surgery Foundation for Research and Education at 900 Cummings Center, Suite 221-U, Beverly, Massachusetts, 01915.
2010 TSFRE RESEARCH AWARD RECIPIENTS

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

Nicholas D. Andersen, MD, Duke University Medical Center
“Calcium Signaling Regulates Cardiomyocyte Growth in Hypoplastic Left Heart Syndrome”

David N. Anderson, MD, Memorial Sloan Kettering Cancer Center
“SCCRO (DCUN1D1) Is Essential for Cellular Transformation”

Alejandro Bribiesco, BS, MD, Washington University
“Role of Non-Alloimmune Stimuli in Airway Epithelial Cell Differentiation After Lung Transplantation”

William Hiesinger, MD, University of Pennsylvania
“Myocardial Angiogenic Tissue Engineering Via Ex-Vivo Modified Stem Cell Matrix”

TSFRE RESEARCH GRANTS provide operational support of original research efforts by cardiothoracic surgeons who have completed their formal training, and who are seeking initial support and recognition for their research program. Awards of up to $40,000 a year for up to 2 years are made each year to support the work of an early-career cardiothoracic surgeon (within 5 years of first faculty appointment).

Mark Onaitis, MD, Duke University
“The Mechanism of Sox2 in Lung Cancer Development”

Thomas B. Reece, MD, University of Colorado
“The Role of Specific Adenosine Receptor Activation in Ischemic Preconditioning of the Spinal Cord”

Brendon M. Stiles, MD, Weill Medical College, Cornell University
“Disseminated Tumor Cells in the Bone Marrow of Patients with Surgically Resectable Non-Small Cell Lung Cancer: Comparative Genomic Analysis to Matched Primary Tumors”

NINA STARR BRAUNWALD CAREER DEVELOPMENT AWARD provides a biennial award of $115,000 for two years to support the research career development of a woman cardiac surgeon who holds a full-time faculty appointment and who is within 10 years of completion of thoracic surgery residency.

Jennifer C. Hirsch, MD, MS, University of Michigan
“Development of a Congenital Heart Assessment of Sensory and Motor Status (CHASMS) Instrument for Infants Following Cardiac Surgery”
2010 EDUCATION AWARD RECIPIENTS

SIMULATION IN THORACIC SURGERY EDUCATION GRANTS

Provides grants to support the demonstration study for the application of simulation in thoracic surgery education.

Leora B. Balsam, MD, New York University
"Simulator for Conventional and Limited Access Mitral Valve Surgery"

Raphael Bueno, MD, Brigham and Women’s Hospital

Joanna Chikwe, MD, Mount Sinai Medical Center
"High Fidelity Simulation in Preparing Medical Students for Integrated Cardiothoracic Residency Training"

Yolonda L. Colson, MD, PhD, Brigham and Women’s Hospital
"Exportable Crisis Management Assessment Curriculum (ECMAC)"

Richard Feins, MD, University of North Carolina
"Multicenter Cardiac Simulator Beta Testing"

M. Blair Marshall, MD, Georgetown University Hospital
"Development of Task Specific Cardiothoracic Simulation Models for Independent Study and Skill Acquisition"

Shari L. Meyerson, MD, University of Arizona
"Validation of a Thoracoscopic Lobectomy Simulator"

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<td>Muhlbaier Lawrence</td>
<td>CF2</td>
</tr>
<tr>
<td>Murthy Sudish</td>
<td>18</td>
</tr>
<tr>
<td>Nicolson Susan</td>
<td>CF21</td>
</tr>
<tr>
<td>Nowicki Edward</td>
<td>13, 17</td>
</tr>
<tr>
<td>Nussbaum Marcy</td>
<td>11</td>
</tr>
<tr>
<td>O'Brien Sean</td>
<td>8</td>
</tr>
<tr>
<td>Oguntolu Olusola</td>
<td>CF2</td>
</tr>
<tr>
<td>O'Hara Carl</td>
<td>CF15</td>
</tr>
</tbody>
</table>
Author | Program Number
--- | ---
Onaitis Mark | CF14
Oostdyk Alicia | 14
Orringer Mark | CF12
Overholt Edward | CF18
Park Bernard | CF9
Parrish Andrea | CF20
Parsa Cyrus | CF1
Pass Harvey | 20
Patel Nirav | 6
Patel Shivani | 15
Permut Lester | CF20
Pacentino Valentino | CF8
Powell Charles | CF10
Puskas Ferenc | 5
Rajeswaran Jeevanantham | 18
Rankin J. Scott | 8, CF2
Reames Mark | 11
Reardon Christine | CF15
Reece T. Brett | 21, CF6
Reece Thomas | 5
Rice Thomas | 18
Rizk Nabil | CF9
Robicsek Francis | 11
Romp Robert | CF18
Rosseli Eric | 17
Rossignac Jarek | CF19
Rusch Valerie | CF9
Russo Mark | 4
Rybicki Lisa | 18
Sahik Joseph | 13
Sapru Anil | CF23
Schenkman Kenneth | CF20
Schmitto Jan | CF4
Schuchert Matthew | 14
Schwartz Charles | 6
Setton Matan | 10
Shafii Alexis | 13
Shah Rachit | 14
Sheng Shubin | 8
Shrager Joseph | 9
Silverberg Robert | 22
Singla Smit | 9
Skipper Eric | 11
Sloan Karin | CF15
Smith Michael | CF11
Smith P Brian | 10
Smith Peter | 8
Smith Phillip | 5
Sohn Helen | 3
Solomon Brian | 20
Sonett John | CF10
Sood Adithya | 15
Spentzas Thomas | CF18
Spray Thomas | CF19, CF21
Saroum Sotiris | 11
Svensen Kristen | CF21
Siegel Robert | 11
Stone Neil | 22
Stratton Charles | CF2
Subramanian Sreekuman | 17
Subramanian Valavanur | 6
Sundareswaran Kartik | CF19
Svensson Lars | 17
Sylvestor Juhe | CF13
Takahashi Ryuichi | CF3
Tchantchealishvili Vakhtang | CF4
Tong Betty | CF14
Trehan Naresh | 6
Trochtenberg D | CF2
Tsirigotis Dimitrios | CF8.5
Ueda Toshikiko | CF3
Vaduganathan Muthiah | 1, 22
Villamizar Nestor | CF8
Wagner Patrick | CF9

Ojai Valley Inn, Ojai, California
## IS YOUR WTSA MEMBERSHIP INFORMATION CURRENT?

**DO YOU HAVE:**

- A new email address at your office or home?
- A new address or phone number?

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

(Please Print)

<table>
<thead>
<tr>
<th>First Name</th>
<th>M</th>
<th>Last Name</th>
<th>Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email Address</td>
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<td></td>
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</tr>
</tbody>
</table>

### OFFICE ADDRESS

Institution

<table>
<thead>
<tr>
<th>Address</th>
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</table>

<table>
<thead>
<tr>
<th>City</th>
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<th>Zip</th>
<th>Country</th>
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</table>

Office Phone

<table>
<thead>
<tr>
<th>Office Phone</th>
<th>Office Fax</th>
</tr>
</thead>
</table>

### HOME ADDRESS

<table>
<thead>
<tr>
<th>Address</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>City</th>
<th>State</th>
<th>Zip</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Home Phone</th>
<th>Home Fax</th>
</tr>
</thead>
</table>

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: 978-324-0498 or mail to:

**Western Thoracic Surgical Association**

900 Cummings Center, Suite 221-U

Beverly, MA 01915
### SCHEDULE OF EVENTS

#### WEDNESDAY, June 23, 2010

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 a.m. – 1:00 p.m.</td>
<td>Council Meeting</td>
<td>Libbey Boardroom</td>
</tr>
<tr>
<td>1:00 p.m. – 6:00 p.m.</td>
<td>Registration</td>
<td>Hacienda Foyer</td>
</tr>
<tr>
<td>1:00 p.m. – 6:00 p.m.</td>
<td>Speaker Ready</td>
<td>Hacienda Hallway</td>
</tr>
<tr>
<td>7:00 p.m. – 9:00 p.m.</td>
<td>New Members Reception</td>
<td>Herb Garden Pool</td>
</tr>
<tr>
<td>7:00 p.m. – 9:00 p.m.</td>
<td>Kids &amp; Teens Reception (Ages 5 – 18)</td>
<td>Common Pool</td>
</tr>
</tbody>
</table>

#### THURSDAY, June 24, 2010

<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>Arbolada Parking Lot</td>
</tr>
<tr>
<td>7:00 a.m. – 8:00 a.m.</td>
<td>Continental Breakfast</td>
<td>Anacapa Ballroom</td>
</tr>
<tr>
<td>7:00 a.m. – 11:00 a.m.</td>
<td>Family Hospitality</td>
<td>Oak Café</td>
</tr>
<tr>
<td>7:00 a.m. – 12:00 p.m.</td>
<td>Registration</td>
<td>Hacienda Foyer</td>
</tr>
<tr>
<td>7:00 a.m. – 12:00 p.m.</td>
<td>Exhibits</td>
<td>Anacapa Ballroom</td>
</tr>
<tr>
<td>7:00 a.m. – 12:00 p.m.</td>
<td>Speaker Ready</td>
<td>Hacienda Hallway</td>
</tr>
<tr>
<td>8:00 a.m. – 9:00 a.m.</td>
<td>Scientific Session I</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>9:00 a.m. – 9:10 a.m.</td>
<td>New Member &amp; Samson Prize Finalist Introductions</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>9:10 a.m. – 9:55 a.m.</td>
<td>Presidential Address</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>9:55 a.m. – 10:20 a.m.</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Anacapa Ballroom</td>
</tr>
<tr>
<td>10:30 a.m. – 11:40 a.m.</td>
<td>Scientific Session II</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>11:40 a.m. – 12:30 p.m.</td>
<td>Controversies in Thoracic Surgery</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>12:45 p.m. – 5:00 p.m.</td>
<td>Ronald Reagan Presidential Library Tour*</td>
<td>Transportation to Depart from Front Entrance of Hotel</td>
</tr>
<tr>
<td>6:30 p.m. – 10:00 p.m.</td>
<td>*Taste of Ojai Street Festival Theme Dinner</td>
<td>Herb Garden &amp; Recreation Field</td>
</tr>
</tbody>
</table>

#### FRIDAY, June 25, 2010

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 a.m. – 12:00 p.m.</td>
<td>Registration</td>
<td>Hacienda Foyer</td>
</tr>
<tr>
<td>7:00 a.m. – 12:00 p.m.</td>
<td>Simultaneous Breakfast Sessions*</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>7:00 a.m. – 12:00 p.m.</td>
<td>Exhibits</td>
<td>Anacapa Ballroom</td>
</tr>
<tr>
<td>7:00 a.m. – 12:00 p.m.</td>
<td>Continental Breakfast</td>
<td>Hacienda Foyer</td>
</tr>
<tr>
<td>7:00 a.m. – 12:00 p.m.</td>
<td>Family Hospitality</td>
<td>Oak Café</td>
</tr>
<tr>
<td>7:30 a.m. – 12:00 p.m.</td>
<td>Postgraduate Course</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>7:30 a.m. – 11:00 a.m.</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Anacapa Ballroom</td>
</tr>
<tr>
<td>7:45 a.m. – 7:55 a.m.</td>
<td>Scientific Session III</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>7:55 a.m. – 8:00 a.m.</td>
<td>David J. Dugan Award Presentation</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>8:00 a.m. – 8:50 a.m.</td>
<td>Postgraduate Course</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>8:50 a.m. – 10:30 a.m.</td>
<td>Scientific Session III</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>10:30 a.m. – 11:00 a.m.</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Anacapa Ballroom</td>
</tr>
<tr>
<td>11:00 a.m. – 12:00 p.m.</td>
<td>Scientific Session IV</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>1:00 p.m. – 6:00 p.m.</td>
<td>Golf Tournament*</td>
<td>George C. Thomas, Jr., Championship Golf Course</td>
</tr>
<tr>
<td>2:00 p.m. – 4:00 p.m.</td>
<td>Tennis Tournament*</td>
<td>Tennis Center</td>
</tr>
</tbody>
</table>

#### SATURDAY, June 26, 2010

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 a.m. – 11:30 a.m.</td>
<td>Speaker Ready Room</td>
<td>Hacienda Hallway</td>
</tr>
<tr>
<td>6:00 a.m. – 12:00 p.m.</td>
<td>Registration</td>
<td>Hacienda Foyer</td>
</tr>
<tr>
<td>6:30 a.m. – 7:30 a.m.</td>
<td>Continental Breakfast</td>
<td>Anacapa Ballroom</td>
</tr>
<tr>
<td>6:30 a.m. – 10:30 a.m.</td>
<td>Exhibits</td>
<td>Anacapa Ballroom</td>
</tr>
<tr>
<td>7:00 a.m. – 8:15 a.m.</td>
<td>Concurrent Forums</td>
<td>Hacienda Hallway</td>
</tr>
<tr>
<td>7:00 a.m. – 8:15 a.m.</td>
<td>A) Adult Cardiac Session</td>
<td>Hacienda Hallway</td>
</tr>
<tr>
<td>7:00 a.m. – 8:15 a.m.</td>
<td>B) General Thoracic Session</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>7:00 a.m. – 8:15 a.m.</td>
<td>C) Congenital Heart Disease Session</td>
<td>Libbey Boardroom</td>
</tr>
<tr>
<td>7:00 a.m. – 11:00 a.m.</td>
<td>Family Hospitality</td>
<td>Oak Café</td>
</tr>
<tr>
<td>8:25 a.m. – 8:30 a.m.</td>
<td>Paul Samson’s Significance to WTSA</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>8:30 a.m. – 9:50 a.m.</td>
<td>Scientific Session V</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>9:50 a.m. – 10:10 a.m.</td>
<td>Coffee Break, Visit Exhibits &amp; Posters</td>
<td>Anacapa Ballroom</td>
</tr>
<tr>
<td>10:10 a.m. – 11:10 a.m.</td>
<td>Scientific Session VI</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>11:10 a.m. – 12:00 p.m.</td>
<td>C. Walton Lillehei Point-Counterpoint</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>12:00 p.m. – 12:30 p.m.</td>
<td>Business Meeting (Members Only)</td>
<td>Hacienda Ballroom</td>
</tr>
<tr>
<td>12:30 p.m. – 2:30 p.m.</td>
<td>Family Luncheon</td>
<td>Herb Garden &amp; Recreation Field</td>
</tr>
<tr>
<td>7:00 p.m. – 10:00 p.m.</td>
<td>Kids &amp; Teens Banquet (Ages 5-18)</td>
<td>Hacienda Foyer and Ballroom</td>
</tr>
<tr>
<td>7:00 p.m. – 11:00 p.m.</td>
<td>President’s Reception &amp; Banquet (Black Tie Optional)</td>
<td>Hacienda Foyer</td>
</tr>
</tbody>
</table>

*Separate Subscription Required