2014 ANNUAL MEETING
October 16-17, 2014
Portland, OR  The Benson Hotel, A Coast Hotel

FINAL PROGRAM

www.vascularweb.org/pnvs
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Pacific Northwest Vascular Society thanks the following corporate partners for the financial support of the meeting:

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32nd Annual Meeting

October 16–17, 2014
Portland, OR
The Benson Hotel, A Coast Hotel
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2014 PNWVS EXECUTIVE OFFICERS AND COUNCILORS

James Watson, MD. President & Vascular Surgeon
Jerry Chen, MD. Immediate Past-President & Vascular Surgeon
Benjamin Starnes, MD. President-Elect & Vascular Surgeon
Erica Mitchell, MD. Secretary-Treasurer & Vascular Surgeon
Timothy Liem, MD. Senior Councilor & Vascular Surgeon
Niten Singh, MD. Senior Councilor & Vascular Surgeon
Brian Ferris, MD. Middle Councilor & Vascular Surgeon
Nam Tran, MD. Middle Councilor & Vascular Surgeon
Keith Baxter, MD. Junior Councilor & Vascular Surgeon
Glen Rosenborough, MD. Junior Councilor & Vascular Surgeon
CONTACT INFORMATION

The Executive Council reminds its membership that the new contact information for the Pacific Northwest Vascular Society is:

Pacific Northwest Vascular Society Headquarters
Heather Roderick, Society Administrator
1411 5th St.
Anacortes, WA 98221

Telephone: 360-420-6906
Fax: 360-261-6077
Email: pnwvascular@gmail.com
Web: www.vascularweb.org/pnvs
MEETING AT A GLANCE

Thursday, October 16th

3:00pm – 8:00pm  Registration Open - Mayfair Foyer
5:30pm – 6:00pm  Executive Council Meeting – The Wine Room
6:00pm – 7:00pm  Business Meeting – Kent Room
7:00pm – 9:00pm  Welcome Reception & Poster Session – Mayfair Room

Gore and Associates

Friday, October 17th

6:00am – 12:30pm  Registration Open - Mayfair Foyer
7:00am – 8:00am  Breakfast Buffet with Exhibits – Mayfair Room
7:00am – 4:00pm  Exhibits Open – Mayfair Room
7:45am  Presidential Welcome by James Watson, MD and Toshio Inahara, MD Founder of PNWVS
8:00am – 9:00am  Scientific Session I – Kent Room
9:00am – 9:30am  Resident Debate: Renal Artery Stenting for Treatment of Renovascular Hypertension is Dead or Should Be!
For the motion (Swedish) vs. Against the motion (OHSU)
9:30am – 10:00am  Coffee Break & Exhibits – Mayfair Room
10:00am – 11:00am  Scientific Session II
11:00am – 11:30am  Resident Debate: Branched Aortic Endografts are Ready for Prime Time
For the motion (UW) vs. Against the motion (UBC)
11:30am – 12Noon  Invited Lecture: “Emergency Vascular Trauma Injuries Head to Toe”
Donald Trunkey, MD., Oregon Health & Science University
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<td>12Noon - 1:00pm</td>
<td>Buffet Lunch &amp; Visit Exhibits – Mayfair Room</td>
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<td>1:00pm - 2:00pm</td>
<td>Scientific Session III</td>
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| 2:00pm - 2:30pm | Resident Debate: The Endovascular Literature with Respect to Critical Limb Ischemia Can Be Trusted  
For the motion (UW) vs. Against the motion (OHSU) |
| 2:30pm - 3:00pm | Coffee Break with Exhibits – Mayfair Room                             |
| 3:00pm - 4:00pm | Scientific Session IV                                                |
| 4:00pm - 4:30pm | Resident Debate: Surveillance and Prophylactic Repair of Dialysis Access is Appropriate and Cost Effective  
For the motion (VM) vs. Against the motion (Madigan) |
| 4:30pm - 5:30pm | Rapid Fire, Case Presentations & Technical Tips                      |
| 5:30pm - 7:00pm | Closing Reception and Resident Awards –  
Fireplace Lobby                                                       |
| 7:00pm - 9:00pm | Tour of the Legendary Portland Food Carts  
Hosted by OHSU                                                        |
NEW MEMBERS 2014

Amir Azarbal, MD.
Beejay Felicano, MD.
Christian Hamlat, MD.
Benjamin Lerner, MD.
Peter Krieshman, MD.
Damon Pierce, MD.
Sherene Shalhub, MD.

Learn more and apply for membership here.
PAST MEETINGS

Seattle, WA 1984
Portland, OR 1985
Tacoma, WA 1986
Vancouver, BC 1987
Coeur D’Alene, ID 1988
Victoria, BC 1989
Seattle, WA 1990
Portland, OR 1991
Tacoma, WA 1992
Vancouver, BC 1993
Coeur D’Alene, ID 1994
Victoria, BC 1995
Seattle, WA 1996
Portland, OR 1997
Tacoma, WA 1998
Vancouver, BC 1999
Coeur D’Alene 2000
Victoria, BC 2001
Seattle, WA 2002
Portland, OR 2003
Tacoma, WA 2004
Vancouver, BC 2005
Spokane, WA 2006
Victoria, BC 2007
Portland, OR 2008
Seattle, WA 2009
Kelowna, BC 2010
Seattle, WA 2011
Vancouver, BC 2012
Coeur D’ALene, ID 2013
PAST OFFICERS

Toshio Inahara, MD, President 1983
Kaj H. Johansen, MD, Secretary-Treasurer
Kaj H. Johansen, MD, Program

Toshio Inahara, MD, President 1984
Kaj H. Johansen, MD, Secretary-Treasurer
George A. Berni, MD, Program

Toshio Inahara, MD, President 1985
Kaj H. Johansen, MD, Secretary-Treasurer
John W. Kenagy, MD, Program

Richard N. Kleaveland, MD, President 1986
Leland J. Harris, MD, Secretary-Treasurer
Kenton C. Bodily, MD, Program

Henry K. Litherland, MD, President 1987
Leland J. Harris, MD, Secretary-Treasurer
Henry D. Hildebrand, MD, Program

John W. Kenagy, MD, President 1988
Leland J. Harris, MD, Secretary-Treasurer
Charles A. Anderson, MD, Program

Henry D. Hildebrand, MD, President 1989
Kenton C. Bodily, MD, Secretary-Treasurer
R. Eugene Zierler, MD, Program

Lloyd Taylor, MD, President 1990
Kenton C Bodily, MD, Secretary-Treasurer
Gregory L. Moneta, MD, Program
PAST OFFICERS

D. Eugene Strandness, MD, President 1991
Kenton C. Bodily, MD, Secretary-Treasurer
Henry K. Litherland, MD, Program

George A. Berni, MD, President 1992
Milton H. Brinton, MD, Secretary-Treasurer
Charles A. Anderson, MD, Program
John M. Porter, MD, President 1993
Milton H. Brinton, MD, Secretary-Treasurer
Gregory L. Moneta, MD, Program

Joseph G. Sladen, MD, President 1994
Milton H. Brinton, MD, Secretary-Treasurer
R. Eugene Zierler, MD, Program

Kaj H. Johansen, MD, President 1995
Terence M. Quigley, MD, Secretary-Treasurer
Gregory L. Moneta, MD, Program

Gregory L. Moneta, MD, President 1996
Terence M. Quigley, MD, Secretary-Treasurer
Ted R. Kohler, MD, Program

Charles A. Anderson, MD, President 1997
Terence M. Quigley, MD, Secretary-Treasurer
David C. Taylor, MD, Program

Milton H. Brinton, MD, President 1998
David C. Taylor, MD, Secretary-Treasurer
James M. Cook, MD, Program

Eugene Zierler, MD President 1999
David C. Taylor, MD, Secretary-Treasurer
York N. Hsiang, MD, Program
PAST OFFICERS

Terence M. Quigley, MD, President 2000
David C. Taylor, MD, Secretary-Treasurer
Mark H. Meissner, MD, Program

Edmond J. Raker, MD, President 2001
James M. Cook, MD, Secretary-Treasurer
Jerry Chen, MD, Program

David Taylor, MD, President 2002
James M. Cook, MD Secretary-Treasurer
Stephen Murray, MD, Program
Gary Matsumoto, President 2003
James M. Cook, Secretary-Treasurer
James Watson, Program

York N. Hsiang, President 2004
Mark H. Meissner, Secretary-Treasurer
Mark H. Meissner, Program

Jay Cook, MD, President 2005
Mark H. Meissner, MD, Secretary-Treasurer
Jeff Gilbertson, MD, Program

James Peck, MD, President 2006
Mark H. Meissner, MD, Secretary-Treasurer
Gregory J. Landry, MD, Program

Mark Meissner, President 2007
Gregory J. Landry, MD, Secretary-Treasurer
Gerrit Winkelaar, MD, Program

Stephen Murray, MD, President 2008
Gregory J. Landry, MD, Secretary-Treasurer
Benjamin Starnes, MD, Program
PAST OFFICERS

Gerrit Winkelaar, MD, President 2009
Gregory J. Landry, MD, Secretary-Treasurer
Erica Mitchell, MD, Program

Jeffrey Gilbertson, MD, President 2010
Benjamin Starnes, MD, Secretary-Treasurer
Benjamin Starnes, MD, Program

Gregory J. Landry, MD, President 2011
Benjamin Starnes, MD, Secretary-Treasurer
Benjamin Starnes, Program

Daniel Pepper, MD, President 2012
Benjamin Starnes, MD, Secretary-Treasurer
Benjamin Starnes, MD, Program

Jerry Chen, MD President 2013
James C. Watson, President Elect
Erica Mitchell, MD, Secretary Treasurer

SAVE THE DATE

2015 ANNUAL MEETING
October 1–2, 2015
Seattle, WA Renaissance Seattle Hotel
INVITED LECTURER

Emergency Vascular Trauma Injuries
Head to Toe

Donald Trunkey, MD.
Oregon Health & Science University

11:30am – 12:00pm

Trauma surgeons thrive on a certain level of
chaos; part of the job is providing care for patients
with complex, critical injuries. In his experience
as an active combat military surgeon, Donald
Trunkey, MD, Professor Emeritus and former Chair,
Department of Surgery OHSU, has seen them all.

Donald Trunkey, MD is a co-author of Current Therapy of Trauma and Surgical
Critical Care. Dr. Trunkey received his medical degree from the University of
Washington and completed his residency in general surgery at the University of
California, San Francisco. Dr. Trunkey has previously served as Chief of Surgery
at San Francisco General Hospital, Professor and Chairman of the Department
of Surgery at Oregon Health Sciences University, and President of the American
Association for the Surgery of Trauma. He has also held several positions with
the American Board of Surgery, the American Burn Association, the American
College of Surgeons, the American Medical Association, the American Surgical
Association, the American Trauma Society, National Aeronautics and Space
Administration, and the International Society of Surgery, among many others.
Dr. Trunkey has served on the editorial boards of several prestigious professional
publications and is the author of 174 journal articles, 203 book chapters, and 25
books, and is the recipient of numerous awards.
PAST GUEST LECTURERS

Robert Barnes, MD, University of Arkansas 1986
K. Wayne Johnston, MD, University of Toronto 1987
Richard Kempczinski, MD, University of Cincinnati 1988
Brian L. Thiele, MD, Pennsylvania State University 1989
Jonathan B. Towne, MD, Medical College of Wisconsin 1990
Paul M. Walker, MD, University of Toronto 1991
Dennis F. Bandyk, MD, University of South Florida 1992
Robert L. Kistner, MD, Straub Clinic, Honolulu 1993
Allan R. Downs, MD, University of Manitoba 1994
Ralph B. Dilley, MD, Scripps Clinic, La Jolla 1995
Peter Gloviczki, MD, Mayo Clinic, Rochester 1996
Frank Veith, MD, Montefiore Medical Center, Bronx 1997
Kenneth Cherry, MD, Mayo Clinic, Rochester 1998
Robert Zwolak, MD, Dartmouth-Hitchcock, Lebanon 1999
Jerry Goldstone, MD, Case Western Reserve, Cleveland 2000
Carlos Donayre, Harbor UCLA, Torrance 2001
Ronald Dalman, MD, Stanford University 2002
Dennis Bandyk, MD, University of South Florida 2003
Thomas Lindsay, MD, University of Toronto 2004
Joseph L. Mills, MD, University of Arizona 2005
Wesley Moore, MD, UCLA School of Medicine 2006
David Gillespie, MD, Walter Reed Medical Center, Bethesda 2007
David Cossman, MD, Cedar-Sinai Medical Center, Los Angeles 2008
Cherrie Z. Abraham, MD, McGill University, Montreal 2009
Mark Fillinger, MD, Dartmouth-Hitchcock Medical Center, Hanover 2010
Joseph L. Mills, MD, University of Arizona 2011
Daniel F. Bandyk, MD, University of California - San Diego School of Medicine 2012
Thomas L. Forbes, MD Professor of Surgery, Western University, Chief of Vascular Surgery, London Health Sciences Centre 2013
INTENDED AUDIENCE

The PNWVS meeting is designed for:

- Vascular surgeons
- Fellows/residents in vascular surgery and general surgery programs
- Physicians in related specialties
- Interventional radiologists working in the vascular imaging and intervention field
- Physician assistants and nurses involved in the care of vascular surgical patients
- Vascular technologists and vascular lab administrators
- Medical students interested in vascular surgery or vascular surgery related research
- Researchers, administrators, practice managers and allied health professionals with an interest in the science and treatment of vascular disease

PROGRAM LEARNING OBJECTIVES

At the end of this program, participants should be able to:

Cerebrovascular Disease

- Describe the clinical and technical management principles for asymptomatic carotid artery disease
- Describe the clinical and technical management principles for symptomatic carotid artery disease
- Describe current management principles for carotid and vertebral artery dissection
- Identify new methodologies for the diagnosis and treatment of vascular disease as it relates to cerebrovascular disease
PROGRAM LEARNING OBJECTIVES

**Open Surgical and Endovascular Techniques of the Aorta and Aortic Branches**

- Describe the clinical and technical management principles for thoracic aortic aneurysms and great branch vessels
- Describe the clinical and technical management principles for abdominal aortic aneurysms and visceral vessels
- Describe the clinical and technical management principles for aortic and branch vessel dissection
- Identify key features in the clinical and technical management of complications related to repair of thoracic and abdominal aortic aneurysms
- Explain the surgical approaches for both occlusive and aneurysmal visceral artery disease
- Identify new methodologies for the diagnosis and treatment of vascular disease as it relates to aortic aneurysm disease
- Analyze opportunities for system improvement in managing patients with acute and chronic aortic syndromes

**Peripheral Vascular Disease**

- Describe the clinical and technical management principles for patients with Peripheral Artery Disease and claudication
- Describe the clinical and technical management principles for patients with critical limb ischemia
- Identify useful adjunctive treatment modalities to assist in wound healing chronic wounds associated with Peripheral Artery Disease
- Analyze opportunities for system improvement in managing patients with vascular disease and chronic wounds to improve limb preservation
PROGRAM LEARNING OBJECTIVES

Acute and Chronic Venous Disease Treatment

• Apply techniques of venous recanalization to their current practice
• Evaluate various quality of life measures and calculate what is most meaningful for their practice
• Describe the current therapy for acute VTE and evaluate which treatment is most appropriate for a given clinical setting
• Assess the current state of IVC filter use/retrieval and surveillance strategies
• Identify new methodologies for the diagnosis and treatment of vascular disease as it relates to acute and chronic venous disease

Hemodialysis Access

• Apply techniques of fistula creation to their current practice
• Describe factors influencing surgical and endovascular outcomes after fistula creation
• Identify new methodologies for the diagnosis and treatment of vascular disease as it relates to end-stage renal disease
• Describe new technologies for dialysis access
• Analyze opportunities for system improvement in managing patients with dialysis access needs

Non-atherosclerotic Vascular Disease

• Identify clinical presentation, risk factors and clinical and technical management principles for vascular graft infections
• Describe management strategies and techniques for exposing and repairing traumatic vasculature injuries
ACCREDITATION STATEMENT

This program has been reviewed and approved under Section 1 (Accredited Group Learning Activities) of the Framework of CPD Options of the Maintenance of Certification program for a total of 7.25 hours.

This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification program of The Royal College of Physicians and Surgeons of Canada.

This activity has been approved by the Canadian Society for Vascular Surgery.

Through an agreement between the Royal College of Physicians and Surgeons of Canada and the American Medical Association, physicians may convert Royal College MOC credits to AMA PRA Category 1 Credits™. Information on the process to convert Royal College MOC credit to AMA credit can be found at www.ama-assn.org/go/internationalcme.
Scientific Program
WELCOME SESSION

7:45 – 8:00am

Presidential Welcome
James C. Watson, MD
Toshio Inahara, MD, 1983 PNWVS President & PNWVS Founder

8:00am

SCIENTIFIC SESSION I: Cerebrovascular Disease
MODERATOR: James C. Watson, MD, Pacific Northwest Vascular Society President, Clinical Instructor UW Medicine & Surgeon Swedish Heart & Vascular Institute

1) 8:00 – 8:15am

Hybrid Repair of the Aortic Arch
C Burke MD, MP Sweet MD, BW Starnes MD, GS Aldea MD, JD Pal MD
Presenter: Matthew Sweet, MD
University of Washington

2) 8:15 – 8:30am

Carotid Duplex Peak Systolic Velocity Does Not Predict Intraplaque Hemorrhage
AL Rodriguez MD, TS Hatsukami MD, E Eugenio, GL Tang MD
Presenter: April L. Rodriguez, MD
University of Washington

3) 8:30 – 8:45am

Natural History of Indeterminate Blunt Cerebral Vascular Injury
JD Crawford MD, KM Allan BS, K Patel AF Azarbal MD, TK Liem MD, EL Mitchell MD, GL Moneta MD, GJ Landry MD
Presenter: Kevin M. Allan, BS, Medical Student, Department of Vascular Surgery
Oregon Health and Sciences University
4) 8:45 – 8:50am
Case: A Hybrid Approach to the Treatment of a Head and Neck Venous Malformation
AL Rodriguez MD, MH Meissner MD
Presenter: April L. Rodriguez, MD
University of Washington

5) 8:50 – 8:55am
Case: Extensive Large Vessel Calcification in the Setting of Presumptive Takayasu Arteritis
BT Garland MD, N Singh MD, BW Starnes MD
Presenter: BT Garland, MD
University of Washington

8:55 – 9:00am
Case Q&A

9:00 – 9:30am
Resident Debate: Renal Artery Stenting for Treatment of Renovascular Hypertension Is Dead or Should Be!
For the motion: David Brown, MD, Swedish Medical Center vs.
Against the motion: Khanh Nguyen, MD, Oregon Health & Sciences University

9:30 – 10:00am
Coffee Break and Exhibits
10:00am

**SCIENTIFIC SESSION II: Open Surgical and Endovascular Techniques of the Aorta and Aortic Branches**

MODERATOR: Benjamin W. Starnes, Pacific Northwest Vascular Society President-Elect, Professor of Surgery and Chief of Vascular Surgery, UW Medicine

6) 10:00 – 10:15am

**Influence of Gender on Abdominal Aortic Aneurysm Repair In The Community** *

D Nevidomskyte MD, S Shalhub MD MPH, N Singh MD, E Farokhi MD, N Tran MD, MH Meissner MD  
Presenter: Davia Nevidomskyte, MD  
University of Washington

7) 10:15 – 10:30am

**Preoperative Risk Score for the Prediction Of Mortality Following Repair of Ruptured Abdominal Aortic Aneurysms** *

BT Garland MD, P Danaher PhD, NT Tran MD, E Quiroga MD, N Singh MD, BW Starnes MD  
Presenter: BT Garland, MD  
University of Washington

8) 10:30 – 10:45am

**The Incidence of Ischemic Colitis After Repair of Ruptured Abdominal Aneurysms is Decreasing in the Endovascular Era**

SK Desikan MD, N Singh MD, SR Steele, N Tran MD, E Quiroga MD, BT Garland MD, BW Starnes MD.  
Presenter: SK Desikan MD  
University of Washington
9) 10:45 – 11:00am
**Blunt Abdominal Aortic Injury: A Multicenter Study**
Presenter: Sherene Shalhub, MD
University of Washington

11:00 – 11:30am
**Resident Debate: Branched Aortic Endografts are Ready for Prime Time**
For the motion: Ty Garland, MD, University of Washington vs.
Against the motion: Steven Johnson, MD, University of British Columbia

11:30 – 12 Noon
**Invited Lecture: “Emergency Vascular Trauma Injuries Head to Toe”**
Donald Trunkey, MD, Oregon Health & Science University

12 Noon – 1:00pm
**Lunch**

1:00pm
**SCIENTIFIC SESSION III: Peripheral Vascular Disease**
MODERATOR: Niten Singh, MD, Pacific Northwest Vascular Society, Senior Councilor & Associate Professor Surgery UW Medicine

10) 1:00 – 1:15am
**Determining the Toe-Brachial Index in Young Healthy Adults**
RY Yu BSc, WL Quong BSc, A Fung Bsc, YN Hsiang MD
Presenter: Rollin Yu, MD
University of British Columbia
11) 1:15 – 1:30pm
**Increased Rates of Lower Extremity Revascularization May Not Lower Amputation Rates**
AF Azarbal MD, S Harris MD, EL Mitchell MD, TK Liem MD, GJ Landry MD, R McLafferty MD, GL Moneta, MD
Presenter: Sheena Harris, MD
Portland VA Medical Center and Oregon Health and Science University

12) 1:30 – 1:45pm
**Aortobifemoral Graft Infection: Is Unilateral Limb Excision Definitive?**
JD Crawford MD, AF Azarbal MD, TK Liem MD, GJ Landry MD, GL Moneta MD, EL Mitchell MD
Presenter: Matt Roos, MD
Oregon Health and Sciences University

13) 1:45 – 2:00pm
**Alternative Strategies To Manage Groin Lymphoceles**
Presenter: EJ Raker, MD
Virginia Mason Medical Center

2:00 – 2:30pm
**Resident Debate: The Endovascular Literature with Respect to Critical Limb Ischemia Can Be Trusted**
For the motion: Daiva Nevidomskyte MD, University of Washington vs.
Against the motion: Matt Roos, MD, Oregon Health and Sciences University

2:30 – 3:00pm
**Coffee Break-Exhibits**
3:00pm

SCIENTIFIC SESSION IV: Acute and Chronic Venous Disease Treatment, Hemodialysis Access, & Non-atherosclerotic Vascular Diseases
MODERATOR: Timothy K. Liem, MD, Pacific Northwest Vascular Society, Senior Councilor & Associate Professor Surgery, OHSU

14) 3:00 – 3:15pm
Spontaneous Pneumothorax Precedes Vascular and Colon Abnormalities in Vascular Ehlers-Danlos Syndrome
D Sanchez BS, S Shalhub MD MPH, AC Cecchi MS, JH Black III MD, NB McDonnell MD Ph, DM Milewicz MD PhD
Presenter: Desiree Sanchez, BS
University of Washington

15) 3:15 – 3:30pm
Outcomes in the Management of Renal-Pelvic Congestion Syndrome
DP Nathan MD, MH Meissner MD
Presenter: Derek Nathan, MD
University of Washington

16) 3:30 – 3:45pm
Surgical Revision for Non-maturing Arteriovenous Fistulas
TK Liem MD, FM Hacker BS, AA Price, AF Azarbal MD, GJ Landry MD, EL Mitchell MD, GL Moneta MD
Presenter: Timothy Liem, MD
Oregon Health & Science University

17) 3:45 – 4:00pm
Neurogenic Thoracic Outlet Syndrome: A Misnomer!
Presenter: Kaj Johansen, MD, PhD, FACS
Swedish Medical Center
4:00 – 4:30pm

Resident Debate: Surveillance and Prophylactic Repair Of Dialysis Access is Appropriate and Cost Effective
For the motion: Owen Young, MD, Virginia Mason Medical Center vs. Against the motion: Josh Smith, MD, Madigan Army Medical Center

4:30pm

Rapid Fire, Case Presentations & Technical Tips
MODERATORS: Nam T. Tran, MD. Middle Councilor, Associate Professor Surgery UW Medicine & Brian Ferris, MD, Middle Councilor, Vascular Surgeon Lake Washington Vascular

18) 4:30 – 4:35pm

EVAR: The Gift That Keeps on Giving
Presenter: James C. Watson, MD, Clinical Instructor Pacific Northwest Vascular Society President UW Medicine & Surgeon Swedish Heart & Vascular Institute

19) 4:35 – 4:40pm

Transthoracic Hybrid Repair of a Complex Saccular Thoracic Arch Aneurysm by Vessel Reconstruction and Tevar
D Pierce MD, D Neuzil MD, M Cecchini MD, G Lisse MD MPH
Presenter: Damon Pierce, MD Virginia Mason Medical Center

20) 4:40 – 4:45pm

Hybrid Treatment Of Mycotic Aortic Arch Aneurysm, A Case Report
H Hajari, MD
Presenter: Homayon Hajari, MD Northwest Permanente PC Vascular and Endovascular Surgery Kaiser Sunnyside Medical Center
21) 4:45 – 4:50pm  
**Endovascular Therapy For AneuRx Graft Migration**  
Presenter: SL Tan MD PhD  
Swedish Medical Center, Vascular & Surgical Care Northwest

22) 4:50 – 4:55pm  
**Giant Symptomatic Right Subclavian Artery Aneurysm**  
GA Wallace MD, NT Tran MD  
Presenter: Gabriel Wallace, MD  
Harborview Medical Center, University of Washington

23) 4:55 – 5:00pm  
**Endovascular Repair of Bilateral Iliac Artery Aneurysms with a Trifurcated Endograft**  
KR Kniery MD, FG Vladimir MD  
Presenter: Kevin Kniery, MD  
Madigan Army Medical Center

24) 5:00 – 5:05pm  
**Laparoscopic Management of Median Arcuate Ligament Syndrome: Case Report**  
V Gunn MD, K Baxter BSc MSc MD FRCSC  
Presenter: Virginia Gunn, MD, MHSc  
University of British Columbia

25) 5:05 – 5:10pm  
**Compression of the Superior Mesenteric Artery by the Median Arcuate Ligament: A Unique Cause of Chronic Mesenteric Ischemia**  
P Kreishman MD, Q Hatch MD, C Andersen MD  
Presenter: Peter Kreishman, MD  
Madigan Army Medical Center
26) 5:10 – 5:15pm
**Greater Saphenous Vein Aneurysms: A Rare Cause of Groin Swelling and Pulmonary Embolism** *
JD Crawford MD, JP Jundt MD, MI Foley MD, CC Huang MD, MF Barnatan MD, AD Nicoloff MD
Presenter: Judah Gold-Markel, PA-C
Legacy Health System

27) 5:15 – 5:20pm
**Cystic Adventitial Disease of the Common Femoral Vein with Profunda Femoris Vein Reconstruction** *
E Nearing MD, D Neuzil MD, D Pierce MD, E Raker MD
Presenter: Emmanuel E. Nearing, II, MD
Virginia Mason Medical Center

5:20 – 5:40pm
**Panel Discussion**

5:45 – 7:30pm
**Closing Reception**
Abstracts
ABSTRACTS

#1. HYBRID REPAIR OF THE AORTIC ARCH
C Burke MD, MP Sweet MD, BW Starnes MD, GS Aldea MD, JD Pal MD
Presenter: Matthew Sweet, MD
University of Washington
Seattle, Washington

BACKGROUND: The surgical treatment of aortic arch pathology remains a formidable challenge. Mortality rates of traditional open repair have been reported as high as 10% in some series. Endovascular treatment of abdominal and descending thoracic aortic pathology is well described, with results equaling, and exceeding in some cases, open repair. This has led some to attempt to translate these endovascular technologies to the aortic arch. These techniques range from “hybrid” repairs to total endovascular treatment.

OBJECTIVES: We reviewed our series of patients that have been treated for aortic arch pathology with a hybrid repair, namely an open debranching procedure followed by endovascular stenting in the arch with Zone 1 or Zone 0 landing zones. From May 2008 to June 2014, we treated a total of 10 patients in this fashion. All patients were deemed poor candidates for open repair, one was symptomatic and one was ruptured. Seven patients had primary aneurysms of the aortic arch and 3 patients had previously had an ascending aortic replacement for type A dissection and had developed aneurysmal degeneration of their arch.

RESULTS: Technical success was achieved in 9 out of 10 patients. Two patients had concomitant CABG procedures. Eight of 10 patients survived to hospital discharge. Two patients died in the peri-operative period. One patient with a ruptured aneurysm died on the OR table. One patient died on POD 1 due to MI. Five patients were discharged home following their procedure, with 3 patients requiring skilled nursing facility admission. One patient died 3 months post-operatively after a complicated and prolonged recovery. There was one stroke observed in the study period. One patient developed spinal cord ischemia and a transient neurologic deficit, but ultimately fully recovered. There were two myocardial infarctions noted in the study period, one of which was fatal. One patient developed a type 1A endoleak that is without option for re-intervention. His aneurysm has remained stable. One patient was lost to follow-up during the study period. Treatment success, defined as aneurysm exclusion and return to pre-op functional status, was achieved in 7 out of 10 patients.

CONCLUSION: Our results represent a “real world” single center experience using hybrid technologies to treat aortic arch pathology in patients deemed prohibitive risk for open repair. These data indicate that technical success can be achieved using these techniques. Intermediate-term data indicate these patients can survive several years with hybrid repair. However, there is still significant morbidity associated with these challenging patients. Devices and surgical techniques will continue to require refinement in order to optimize results in these difficult clinical scenarios.
#2. CAROTID DUPLEX PEAK SYSTOLIC VELOCITY DOES NOT PREDICT INTRAPLQUE HEMORRHAGE
AL Rodriguez MD, TS Hatsukami MD, E Eugenio, GL Tang MD
Presenter: AL Rodriguez, MD
University of Washington
Seattle, Washington

BACKGROUND: Intraplaque hemorrhage (IPH) and fibrous cap rupture (FCR), as identified by carotid magnetic resonance imaging, are associated with an increased risk of ischemic neurologic events. However, obtaining an MRI on all patients is not cost effective. Flow modeling studies suggest that high peak systolic velocity (PSV) may be associated with the development of IPH and possibly cap thinning. Our objective was to determine if PSV measured on carotid duplex can identify patients who are high risk for IPH or FCR and would therefore benefit from further imaging with MRI.

METHODS: This was a retrospective study of 67 subjects who had a carotid duplex within 6 months of carotid MRI at our institution between 1995 and 2004. We collected data on PSV from the carotid duplex, as well as the NASCET degree of stenosis, minimum lumen area, presence of IPH or FCR from carotid MRI.

RESULTS: We found no correlation between PSV and the presence of either IPH or FCR. There was a statistically significant correlation between PSV and minimum lumen area (p=0.013, coefficient of variable -0.14) as well as between NASCET stenosis and minimum lumen area (p=0.0004, coefficient of variable -0.22).

CONCLUSION: This data suggest that carotid duplex velocities may not be a good screening tool to identify patients who would benefit from further imaging with MRI. It also confirms that PSV from carotid duplex and NASCET stenosis as measured by MRI correlate with minimum lumen area.
#3. NATURAL HISTORY OF INDETERMINATE BLUNT CEREBRAL VASCULAR INJURY
JD Crawford MD, KM Allan BS, K Patel, AF Azarbal MD, TK Liem MD, EL Mitchell MD, GL Moneta MD, GJ Landry MD
Presenter: Kevin Allen, BS, Medical Student
Oregon Health and Sciences University
Portland, Oregon

BACKGROUND: Blunt cerebrovascular injury (BCVI) is rare but potentially devastating with a stroke rate of 10-59% and disproportionately affects young adults. The severity of injury is well-defined by the Denver classification. However, despite a robust classification scheme there remains a large cohort of patients presenting with indeterminate findings on initial imaging of unknown significance. We reviewed our recent experience with indeterminate BCVIs (iBCVI) to study the outcomes of this patient cohort.

METHODS: A retrospective review using CPT and ICD-9 codes and a prospective trauma registry database were used to identify patients with BCVI at our institution between 2005-2014. Injuries secondary to penetrating trauma, iatrogenic injury or extension of aortic dissection were excluded. BCVIs with a distinct grade of injury on initial imaging as defined by the Denver criteria were also excluded. Any patient with iBCVI by initial imaging was included. Primary outcomes were freedom from stroke or transient ischemic attack (CVA/TIA), rate of resolution and overall survival.

RESULTS: We identified 67 patients with 98 BCVIs. Indeterminate imaging findings were present in 44 arteries in 36 patients. The carotid artery was involved in 47% and vertebral 53% of cases. Mean injury severity score (ISS) and Glasgow coma scale (GCS) for patients was 25.9 and 10.4. Initial imaging was by CTA in 93% of cases. Sixty-four percent of injuries were followed with subsequent imaging using CTA (41%), duplex (27%) and angiography (20%). On follow-up imaging 86% of iBCVI resolved or were unchanged and 14% worsened. Medical therapy with therapeutic anticoagulation or an antiplatelet was instituted in 77% of injuries. Twenty percent of patients received no medical therapy due to contraindications. One patient was treated with carotid artery coiling for worsening dissection. No open surgical interventions were performed. Overall rate of CVA/TIA events was 6.8% all occurring in patients with carotid injury. Overall survival was improved in patients with vertebral compared to carotid injuries (NS). There was no difference in overall survival in treatment with dual medical therapy compared to antiplatelet therapy alone. Overall and 30-day mortality was 20% and 11%, respectively. Median length of clinical follow-up was 99 days.

CONCLUSION: The Denver classification for BCVI is well-validated, however many patients fall outside of this scheme due to indeterminate imaging characteristics. This is the first study to evaluate outcomes and natural history of iBCVI, a common clinical conundrum. These findings demonstrate a majority of iBCVI will remain unchanged or resolve when followed and that the frequency of CVA/TIA is low but more common with carotid injuries. Lastly, treatment with dual medical therapy compared to antiplatelets alone has no apparent mortality or neurologic benefit.
#4. A HYBRID APPROACH TO THE TREATMENT OF A HEAD AND NECK VENOUS MALFORMATION
AL Rodriguez MD, MH Meissner MD
Presenter: April Rodriguez, MD
University of Washington
Seattle, Washington

BACKGROUND: Venous malformations are the most common of all vascular anomalies and treatment is variable depending on location and extent of the malformation. Endovascular treatment using coils, glue or sclerosants has been used as well as open surgical excision.

METHODS: To describe a hybrid approach to repair of a large head and neck venous malformation, for which endovascular access, glue embolization and surgical resection was utilized.

RESULTS: A 45-year-old female with an extensive head and neck venous malformation presented for repeat treatment. In the past she had undergone five rounds of ultrasound guided sclerotherapy due to discomfort from swelling with activity. During her last treatment she was found to have a communication between a venous channel and her left internal jugular vein. At that time the decision was made to undergo a hybrid procedure using glue embolization followed by excision. The patient underwent balloon occlusion of the left internal jugular vein followed by glue embolization of the venous malformation in her neck. The venous malformation was then excised surgically. There were no complications throughout the case and the patient went home the same day.

CONCLUSION: Venous malformations can be successfully treated using a hybrid approach in which endovascular techniques are utilized as well as open surgical resection. Depending on anatomy, location and symptoms this may be the preferred method to addressing certain venous anomalies.
EXTENSIVE LARGE VESSEL CALCIFICATION IN THE SETTING OF PRESUMPTIVE TAKAYASU ARTERITIS
BT Garland MD, N Singh MD, BW Starnes MD
Presenter: BT Garland, MD
University of Washington
Seattle, Washington

BACKGROUND: Takayasu arteritis is a large vessel vasculitis that often results in pulselessness due to fibrotic stenoses. Calcification in the absence of renal failure or hyperparathyroidism is rare in this setting, but has been attributed to disorders in calcium trafficking in a chronic inflammatory state. We report an unusual case of rapidly progressive aortic calcification in the setting of presumptive Takayasu arteritis.

CASE REPORT: A twenty-five year old woman presents with bilateral lower extremity claudication. After extensive medical work-up, she was managed expectantly for the clinical diagnosis of burned-out Takayasu arteritis with negative serum markers. Four years later she underwent angioplasty and bilateral iliac stenting for disabling claudication, but by the age of thirty-three her symptoms returned, now with renovascular hypertension. CT angiogram showed extensive coral-reef aortic calcification, and DEXA scan revealed severe osteopenia. Surprisingly, there was no evidence of primary hyperparathyroidism or renal dysfunction and all rheumatologic serologies were negative for active disease. She was treated with aspirin and lisinopril, but despite continued negative rheumatologic markers, her paravisceral aortic calcification progressed and she developed symptoms of mesenteric ischemia. Aortic pressure gradient across the paravisceral calcification was measured at greater than 100mmHg. As medical therapy had proven ineffective, she underwent multidisciplinary review and was offered surgical intervention due to her rapidly progressive disease. She underwent descending thoracic aorto-bi-iliac with SMA and bilateral renal artery bypass. Antegrade perfusion was maintained throughout the operation, shunting from the descending thoracic aorta to the visceral vessels. She tolerated the procedure well and recovered with ankle-brachial indices greater than one and no further symptoms.

CONCLUSIONS: Extensive calcification in the setting of large vessel vasculitis is rare and only described in single case reports. Progressive disease without evidence for active inflammation suggests other mechanisms, such as a disorder of calcium trafficking. While surgical bypass is an effective treatment for extensive aortic calcification, further research into mechanisms of mineral metabolism in the setting of chronic inflammation may lead to adjunctive medical therapy for this highly morbid and rapidly progressive disease.
#6. INFLUENCE OF GENDER ON ABDOMINAL AORTIC ANEURYSM REPAIR IN THE COMMUNITY
D Nevidomskyte MD, S Shalhub MD MPH, N Singh MD, E Farokhi MD, N Tran MD, MH Meissner MD
Presenter: D Nevidomskyte, MD
University of Washington
Seattle, Washington

BACKGROUND: Women have been shown to experience inferior outcomes following intact and ruptured abdominal aortic aneurysm (AAA) treatment in endovascular (EVAR) and open surgical repair (OSR) groups. The goal of our study was to compare gender-specific presentation, management and early outcomes after AAA repair using a statewide registry.

METHOD: We utilized the Washington State Surgical Care and Outcomes Assessment Program (VI-SCOAP) registry data collected in 19 hospitals from July 2010 to September 2013. Demographics, presentation, procedural data and outcomes between men and women undergoing elective and emergent AAA repair were analyzed. Comparisons were made using Pearson $\chi^2$ test for categorical variables and Student $t$-test for continuous variables with $P$ value <.05 considered to be statistically significant.

RESULTS: We identified 1231 patients (19.6% women) who underwent repair of an intact (n = 1064, 86.4%) or ruptured AAA (n = 167, 13.6%) over a 3-year period. 972 (79%) had EVAR and 259 (21%) had OSR. Men and women were of equivalent age (73.1 vs 73.4, $p = .59$) and there were no differences in comorbidities or AAA family history. Women had smaller aneurysm diameters (6.2 ± 1.8 vs 5.8 ± 1.1 cm, $p < .01$) at the time of presentation and men had slightly higher incidence of rupture at larger aneurysm size. Men were more likely to undergo EVAR, with the difference originating from elective treatment category (82.1% vs 74.1%, $p = .01$). Overall, women had higher 30-day mortality (6.6% vs 3.5%, $p = .03$) and significantly higher mortality rates in elective EVAR (3.1% vs 0.6%, $p = .01$), but not ruptured or elective OSR groups. Following elective EVAR women were less likely to be discharged to home after longer hospital stays (3 days vs 2 days, $p < .01$).

CONCLUSION: Despite presentation at a similar age, with a smaller aneurysm diameter, and lower incidence of rupture, women experience substantially worse hospital outcomes driven by elective endovascular procedures. In addition, utilization of endovascular techniques in women still remains lower compared to men. Improvement of elective outcomes in women will likely depend on technical advancements in repair techniques and management strategies that may differ between genders.
#7. PREOPERATIVE RISK SCORE FOR THE PREDICTION OF MORTALITY FOLLOWING REPAIR OF RUPTURED ABDOMINAL AORTIC ANEURYSMS
BT Garland MD, P Danaher PhD, NT Tran MD, E Quiroga MD, N Singh MD, BW Starnes MD
Presenter: BT Garland, MD
University of Washington
Seattle, Washington

BACKGROUND: Scoring systems for predicting mortality in patients with ruptured abdominal aortic aneurysms (rAAA) have been derived and validated only for open repair. Many of these scores include intraoperative variables such as use of a suprarenal aortic cross clamp which limits their utility in preoperative planning as well as patient and family counseling. The purpose of this study was to develop and validate a practical mortality risk score using preoperative variables for patients with rAAA for both open (rOR) and endovascular repair (rEVAR), and compare it to other previously published scoring criteria.

METHODS: Data on all patients with rAAA presenting to our institution between Jan 1, 2002 and Oct 31, 2013 were collected. Linear discriminate analysis was used to train and test multiple predictive algorithms consisting of preoperative patient variables. Integer points were derived from the odds ratio for mortality (OR) based on each independent predictor of mortality from which we derived the preoperative rAAA mortality risk score. Comparison was made to other predictive models by calculating the area under the receiver operating characteristic curves.

RESULTS: 303 patients presented during the study period. Fifteen patients died either in the ED, en route to surgery, or after choosing comfort care. Overall 30-day mortality for patients undergoing rOR was 54% and those undergoing rEVAR 22%. Preoperative variables most predictive of mortality were preoperative SBP <70mmHg (OR 2.7, p<.05), pH <7.2 (OR 2.6, p<.05), age <76 (OR 2.1, p<.05) and creatinine >2(OR 3.7, p<.05). Patient stratification according to the preoperative rAAA mortality risk score (range, 0-4) accurately predicted mortality and identified those at low and high risk for death. While the VSGNE score, Glasgow aneurysm score and Edinburg score were validated in our contemporary dataset for both open and endovascular repair, our preoperative risk score was most predictive with AUC of 0.67.

CONCLUSIONS: Existing scoring systems predict mortality after rAAA repair in our cohort but rely on intraoperative variables. Our rAAA mortality risk score is based on four variables readily assessed preoperatively, allows accurate prediction of in-hospital mortality after repair of rAAAs in the EVAR-first era and does so more accurately than those previously described.
OBJECTIVE: Ischemic colitis (IC) is a well-described complication of ruptured abdominal aortic aneurysms (rAAA). The purpose of this study was to compare the incidence of IC in patients with rAAA undergoing open (OR) vs. endovascular aneurysm repair (EVAR) at a single institution. In addition, we analyzed incidence of ischemic colitis pre- and post-implementation of a formal rupture AAA protocol.

METHODS: A retrospective analysis of prospectively collected data on all patients presenting with rAAA to our institution between Jan 2002 and Oct 2013 was performed. Variables were analyzed for association with IC. Comparisons were made using Pearson’s chi-squared test for categorical variables, Student t-test for continuous variables, and logistic regression for multivariate analysis. Significance was set at p<0.05.

RESULTS: 303 patients with rAAA presented over the 10 year study period. 191 patients underwent open repair and 89 patients underwent endovascular repair. 23 patients died either in the emergency department, en route to the operating room, or after choosing comfort care. Predictive factors of IC included EBL, corresponding need for resuscitation, and duration of procedure. Of the patients undergoing open repair, the rate of ischemic colitis was 21% (40/191). This was significantly higher than patients who underwent EVAR, 6.7% (6/89), p=0.000. Type of intervention did not influence 30 day mortality in patients with IC. However, only 17% (1/6) of patients who had IC following EVAR required colectomy vs. 48% (19/40) of patients with IC following OR (p=0.21). Implementation of our formal REVAR protocol decreased the incidence of IC significantly from 37.1% (36/97) to 6.4% (10/157), p=0.000.

CONCLUSIONS: Incidence of ischemic colitis has decreased significantly in the endovascular era, but continues to portend a poor prognosis. Implementation of a formal, multidisciplinary REVAR protocol decreases the incidence of IC.
#9. BLUNT ABDOMINAL AORTIC INJURY: A MULTICENTER STUDY
S Shalhub MD MPH, BW Starnes MD, ML Brenner MD MS, WL Biffl MD, A Azizzadeh, MD, K Inaba MD, D Skiada, MD, B Zarzaur, MD MPH, C Nawaf MD, EA Eriksson MD, SM Fakhry MD, JS Paul MD, KL Kaups MD MSc, DJ Ciesla MD, SR Todd MD, MJ Seamon MD, LM Capano-Wehrle MPH, GJ Jurkovich MD, RA Kozar, MD
Presenter: Sherene Shalhub, MD
University of Washington
Seattle, Washington

BACKGROUND: Blunt Abdominal Aortic Injury (BAAI) is a rare injury. The objective of the current study was to examine the presentation and management of BAAI at a multi-institutional level.

METHODS: The Western Trauma Association Multi-Center Trials conducted a study of BAAI from 1996 to 2011. Data collected included demographics, injury mechanism, associated injuries, interventions, and complications.

RESULTS: Of 392,315 blunt trauma patients, 113 (0.03%) presented with BAAI at 12 major trauma centers (67% male, median age 38 years old, range 6-88, median ISS 34, range 16-75). The leading cause of injury was motor vehicle collisions (60%). Hypotension was documented in 47% of the cases. The most commonly associated injuries were spine fractures (44%), and pneumothorax/hemothorax (42%). Solid organ, small and large bowel injuries occurred in 38%, 35%, and 28% respectively. BAAI presented as free aortic rupture (32%), pseudoaneurysm (16%), and injuries without aortic external contour abnormality on computed tomography (CT) such as large intimal flaps (34%) or intimal tears (18%). Open and endovascular repairs were undertaken as first choice therapy in 43% and 15% of cases respectively. Choice of management varied by type of BAAI: 89% of intimal tears managed non-operatively and 96% of aortic ruptures treated with open repair. Overall mortality was 39%, the majority (68%) occurring in the first 24 hours due to hemorrhage or cardiac arrest. The highest mortality was associated with zone II aortic ruptures (92%). Follow up was documented in 38% live discharges.

CONCLUSION: This is the largest BAAI series reported to date. BAAI presents as a spectrum of injury ranging from minimal aortic injury to aortic rupture. Non-operative management is successful in uncomplicated cases without external aortic contour abnormality on CT. Highest mortality occurred in free aortic ruptures, suggesting that alternative measures of early non-compressible torso hemorrhage control are warranted. Level of Evidence and study type: Level IV, Multicenter retrospective review.
#10. DETERMINING THE TOE-BRACHIAL INDEX IN YOUNG HEALTHY ADULTS
RY Yu BSc, WL Quong BSc, A Fung Bsc, YN Hsiang MD
Presenter: Rollin Yu, MD
University of British Columbia
Vancouver, British Columbia

BACKGROUND: Despite growing interest in utilizing the toe-brachial index (TBI) for clinical assessment of patients, there has not been any published study on the normal TBI in young, healthy individuals to determine a reference range. The purpose of this study was to determine the TBI in healthy young adults and compare the measured value with the currently accepted clinical value.

METHODS: Medical Students from the undergraduate class were prospectively recruited. Physical measurements (height, weight), health behaviors (physical activity quantity and type, smoking status, alcohol consumption), and medical history (medications, relevant diagnoses, family history) were collected. Bilateral brachial, toe and ankle blood pressures (using both dorsalis pedis and posterior tibial arteries) were measured. TBI was calculated as the mean toe blood pressure divided by the highest systolic brachial blood pressure.

RESULTS: 40 medical students with a mean age of 24.7 ± 2.1 years without any comorbid conditions were studied. There were no current or past smokers. Participants maintained relatively healthy lifestyles (hours of activity per week: 5.1 ± 3.3; BMI: 21.7 ± 2.4). Caffeine and alcohol consumption was modest (10.6 ± 8.5 and 1.8 ± 2.7 drinks per week respectively). The mean systolic brachial blood pressure was 121 ± 9 mmHg (right), and 116 ± 9 mmHg (left). The TBI was 0.95 ± 0.11 (right) and 0.97 ± 0.13 (left) for males, and 0.86 ± 0.13 (right) and 0.86 ± 0.20 (left) for females.

CONCLUSION: The distribution of TBI in this healthy population differs significantly from the referenced normal range of 0.6-1.0. Our findings suggest that the accepted value of 0.6 for the low-normal limit is too low; this level may promote underdiagnosis of peripheral vascular disease, and represent foregone opportunities for early intervention. We recommend that the TBI reference range be modified to increase the clinical utility of this measurement.
#11. INCREASED RATES OF LOWER EXTREMITY REVASCULARIZATION MAY NOT LOWER AMPUTATION RATES
AF Azarbal MD, S Harris MD, EL Mitchell MD, TK Liem MD, GJ Landry MD, R McLafferty MD, GL Moneta, MD
Presenter: Sheena Harris, MD
Portland VA Medical Center and Oregon Health and Science University

INTRODUCTION: A recent Medicare database study of nearly 100,000 patients undergoing major lower extremity amputations (MLEA) for peripheral arterial disease (PAD) demonstrated that increased regional rates of lower extremity revascularization (LER) are associated with lower rates of MLEA. However, it is unclear whether this data represents underutilization of LER in certain regions or differences in patient factors that limit LER options.

METHODS: The medical records of all patients undergoing MLEA for PAD between 8/1/2011-11/1/2013 at our institution were reviewed. Patient demographic data, initial presentation, vascular supply, imaging, and subsequent surgical/endovascular interventions were assessed. The reason for limb-salvage failure was assessed in each case.

RESULTS: 82 patients underwent 95 MLEA over a 27 month period. 18 (19%) patients underwent surgical or endovascular LER without subsequent wound healing and progressed to amputation. 25 (26%) patients presented with non-salvageable infection or tissue loss, predominantly due to diabetic foot infections, and were not candidates for LER. 26 (27%) patients presented with critical limb ischemia (25 tissue loss, 1 rest pain) and did not have LER options, almost exclusively due to lack of a distal target vessel. 17 (18%) patients were non-ambulatory and underwent primary amputation. 4 (4%) patients underwent amputation for non-healing wounds/minor amputations without angiographic evaluation of LER options and 5 (5%) patients chose primary amputation over LER.

CONCLUSION: At 19%, the rate of LER prior to MLEA at our institution is lower than most regions identified in a large Medicare database study. More aggressive revascularization would be unlikely to significantly lower the rates of MLEA in our population. Lower rates of LER prior to MLEA in our population reflect a high proportion of patients presenting with non-salvageable tissue loss and non-reconstructable PAD, for whom LER is not an option.
#12. AORTOBIFEMORAL GRAFT INFECTION: IS UNILATERAL LIMB EXCISION DEFINITIVE?

J Crawford MD, AF Azarbal MD, TK Liem MD, GJ Landry MD, GL Moneta MD, EL Mitchell MD

Presenter: Jeffrey D. Crawford, MD
Oregon Health and Sciences University
Portland, Oregon

BACKGROUND: Aortic graft infections are rare occurring in 0.2-5% of open aortic reconstructive cases and even less frequently in endovascular aortic interventions. Graft infections can result in thrombosis, pseudoaneurysm, rupture, aortoenteric fistula or sepsis. An infected aortobifemoral (ABF) graft often presents with only one infected limb. Consequently, unilateral excision of the infected limb may be performed leaving the aortic body and contralateral limb prosthetic in place. There is no consensus regarding the appropriate management of patients with a single infected ABF limb. This study aims to study outcomes of a modern cohort of patients undergoing unilateral limb excision for infected ABF.

METHODS: A retrospective review using CPT and ICD-9 codes was used to identify patients treated at our institution with unilateral limb excision for infected ABF from 2001-July 2014. Patients with endovascular grafts were excluded. Primary outcomes were freedom from contralateral ABF limb excision and overall survival. Secondary outcomes were length of stay and post-operative complications.

RESULTS: We identified 15 patients treated for infected ABF with unilateral graft excision. Indications for ABF were aortoiliac occlusive disease in 11 and aneurysm in 4 patients. The original operation was performed at an outside facility in 9 patients. Median time from ABF to infected ABF limb was 71.6 months. Excision of the infected limb and revascularization was performed in all cases (femoral-femoral bypass in 10, interposition graft in 3 and axillary-femoral bypass 2 patients). Reconstruction involved femoral vein in 8 patients, cryopreserved femoral vein in 1, reversed saphenous vein in 1, PTFE in 3 and Gore-Tex in 2 patients. Seven patients had a myofascial flap groin closure. Staphylococcus was the predominate causative organism by intraoperative culture. All patients were discharged on extended antibiotic therapy. Six patients (40%) returned with contralateral limb infection with median time to presentation of 20.2 months. Patients requiring contralateral limb excision had a 30-day mortality of 13% compared to 0% for patients with only unilateral limb infection. Overall mortality for the series was 40% with median length of follow-up of 23.8 months.

CONCLUSION: This is the first study to evaluate outcomes of unilateral limb excision for infected ABF. We demonstrate that unilateral limb infection develops late, unilateral excision is associated with high rate of contralateral limb infection (40%) requiring complete graft excision and associated high mortality. We therefore recommend 1) close surveillance following unilateral limb excision for infected ABF to detect signs of contralateral limb infection 2) consideration of early complete excision of the infected aortic prosthesis in select patients and 3) revascularization with autogenous conduit for the treatment of infected, unilateral ABF.
#13. ALTERNATIVE STRATEGIES TO MANAGE GROIN LYMPHOCELES
EJ Raker MD
Presenter: EJ Raker, MD
Virginia Mason Medical Center
Seattle, Washington

BACKGROUND: Groin lymphoceles remain a vexing problem in open vascular surgery.

METHOD: Retrospective review.

RESULTS: Several methods are available to deal with groin lymphoceles. We describe a
talc-based method as well as a method based on myofascial flap.

CONCLUSION: Early intervention provides the best strategy in preventing groin
lymphoceles from developing infection, an issue that is especially important when dealing
with prosthetic grafts.
#14. SPONTANEOUS PNEUMOTHORAX PRECEDES VASCULAR AND COLON ABNORMALITIES IN VASCULAR EHLERS-DANLOS SYNDROME

D Sanchez BS, S Shalhub MD MPH, AC Cecchi MS, JH Black III MD, NB McDonnell MD PhD, DM Milewicz MD PhD
Presenter: Desiree Sanchez, BS

ABSTRACT: Introduction Vascular Ehlers-Danlos syndrome (vEDS) is a connective tissue disorder that leads to arterial dissection and rupture, and colon and uterine perforation. Spontaneous pneumothorax (PTX) is a minor diagnostic criteria of the syndrome. The aim is to describe the prevalence and temporal relationship of spontaneous pneumothorax (PTX) and/or hemothorax (HTX) in vEDS patients in relation to the presentation of arterial pathology manifestation and colon perforation.

METHODS: Patients with confirmed molecular diagnosis of vEDS were enrolled in a longitudinal multi institutional observational natural history study from 2000 to 2012. Data collected included demographics, clinical and family histories, pulmonary, gastrointestinal and arterial pathology, morbidity, and mortality.

Results: A total of 96 cases (39% males, median age 39 years, range 8-79) were enrolled. PTX/HTX was documented in 16 (16.6%) cases. The PTX/HTX preceded the vascular pathology manifestation and colon perforation in 12 cases (75%) by a mean of 7 years (range 0-26). In the majority of cases the PTX/HTX preceded the diagnosis of vEDS (81%) which was then delayed until arterial pathology or colon perforation occurred (63%).

CONCLUSION: The prevalence of PTX/HTX in the vEDS population is substantially higher than that reported in the general population and in the majority of cases occurs prior to the arterial or colon manifestations of vEDS or diagnosis. A spontaneous PTX/HTX in a young patient should prompt suspicion for an undiagnosed connective tissue disorder, including vEDS. Early diagnosis of vEDS could potentially lead to improved survival.
#15. OUTCOMES IN THE MANAGEMENT OF RENAL-PELVIC CONGESTION SYNDROME

DP Nathan MD, MH Meissner, MD
Presenter: Derek Nathan, MD
University of Washington
Seattle, Washington

BACKGROUND: Identifying patients with renal-pelvic congestion syndrome who will benefit from surgical or endovascular therapy is difficult.

METHODS: A retrospective study of patients evaluated for renal-pelvic congestion syndrome at a single institution between November 2009 and January 2014 was performed. Patients underwent operative or non-operative management at the discretion of the attending surgeon. Primary outcome was symptom resolution or improvement. Secondary outcomes included procedural morbidity and need for secondary intervention.

RESULTS: Nineteen patients with a mean age of 38.3 +/- 10.4 years were evaluated for renal-pelvic congestion syndrome. Eighteen patients were female with a mean number of 3.5 +/- 2.2 gestations. Four patients had previously undergone procedures for renal-pelvic congestion syndrome, including left common iliac vein stenting (n=2) and left ovarian vein embolization (n=2). Duplex ultrasonography and axial imaging were obtained in all cases. Diagnostic venography was performed in five patients. Four of the 19 patients underwent non-operative management: 3 had clinical symptoms but no radiologic findings, and 1 had no clinical symptoms but had radiologic findings of renal-pelvic congestion syndrome. The fifteen patients who underwent operative management all had left flank pain or chronic pelvic pain, and imaging demonstrating nutcracker syndrome, ovarian vein diameter greater than 6 mm, or pelvic varicosities. Treatment consisted primarily of left ovarian vein embolization and sclerotherapy (n=6), left renal vein transposition (n=4) left ovarian vein transposition (n=1), left common iliac vein stent (n=1), left renal vein stent (n=1), internal iliac vein branch embolization and sclerotherapy (n=1), and sclerotherapy of labial varicosities (n=1). One patient underwent an additional intervention, consisting of stenting of left renal vein transposition, and 4 patients had recurrent symptoms and were recommended further interventions, which are pending, including right ovarian vein embolization (n=2), embolization of pelvic varicosities (n=1), and sclerotherapy of lower extremity varicosities due to pelvic escape points (n=1). There were no procedure-related complications. Ten (66%) of the patients who underwent operative management had improvement or resolution of symptoms.

CONCLUSION: Renal-pelvic congestion syndrome can be a difficult condition to diagnose and treat. In patients with symptoms and imaging findings of renal-pelvic congestion syndrome, various surgical and endovascular therapies can be performed with safety and improvement in symptoms. A not insignificant percentage of patients undergo or will undergo secondary interventions in the management of this syndrome.
#16. SURGICAL REVISION FOR NON-MATURING ARTERIOVENOUS FISTULAS
TK Liem MD, FM Hacker BS, AA Price, AF Azarbal MD, GJ Landry MD, EL Mitchell MD, GL Moneta MD
Presenter: Timothy K. Liem, MD
Oregon Health & Science University
Portland, Oregon

ABSTRACT: Background: Arteriovenous fistulas (AVF) are the preferred access for patients who require hemodialysis. However, some AVFs require additional surgery to augment maturation. This study determined the effectiveness of AVF revision and the clinical characteristics of patients with poorly maturing fistulas.

METHODS: All AVFs performed over a 5-year period (January 2006 – December 2011) were reviewed, classified as radial-cephalic (RC), brachial-cephalic (BC), brachial-basilic transposition (BVT), and brachial-brachial (BB). Technical factors and co-morbidities for AVFs that matured without assistance were compared with fistulas that required revision or were abandoned. Data were evaluated on a per-patient basis (Chi-square and t-test, P-value <.05).

RESULTS: 292 AVFs were created in 250 patients. 134/250 fistulas (53.6%) matured without assistance, within an average of 71 days. Patients with AVFs that matured without revision were more likely to be male (60.6% vs 42.1%, P<.01), have a lower BMI (26.9 vs 29.8, P<.01), and a larger preoperative vein diameter (3.83mm vs 3.42mm, P<.02). The most common cause for abandoning a fistula was thrombosis (62%). 54 of 116 non-matured AVFs were revised (70% RC, 26% BC, 4% BVT). The more common revisions were branch ligation (52%), superficial transposition (31%), and anastomotic revision (30%). 89% required one, 9% two, and 2% required three revisions to achieve maturation. Average time from index AVF creation to maturation in revised patients was 209 days, with 42/54 patients (79.2%) developing a usable fistula, increasing the overall maturation rate to 70.4%.

CONCLUSIONS: In selected patients with poorly maturing fistulas, surgical revision will result in a usable fistula in the majority. However, these interventions are associated with significant delays.
#17. NEUROGENIC THORACIC OUTLET SYNDROME: A MISNOMER!
Presenter: Kaj Johansen, MD, PhD, FACS
Swedish Medical Center
Seattle, Washington

BACKGROUND: The term «neurogenic thoracic outlet syndrome» (NTOS)transmits the long-standing conviction that this condition arises as a consequence of dysfunction of the cervical nerve roots and the trunks, cords and branches of the brachial plexus. And the focus on treatment of this condition has historically been directed toward decompressing the nerves of the brachial plexus. I advance the alternative suggestion that, in the main, the upper extremity nerves are normal in patients with neurogenic thoracic outlet syndrome, and that the focus of treatment insteadshould be directed toward the abnormal scalene muscles which invest those nerves.

METHODS: Review of the results of 1200 primary operations for NTOS carried out over the past 18 years, the first 600 of which focused on first rib resection plus scalenotomy/scalenectomy, and the second 600 of which have focused on total scalenectomy and first rib preservation. In addition, the results of the use of intrascalenecanesthetic or botulinum toxin A, and the literature addressing the issue of whether or not first rib resection is required, are reviewed.

RESULTS: By followup clinical assessment and by QuickDASH score, no difference exists in outcome, patient satisfaction or return to work, whether or not the first rib was removed. Other authors (Chang and Stoney 1991, Sanders 1992) concur. Clearly more favorable outcomes result when the anterior, middle and minimus scalene muscles are removed completely rather than simply incised. Results of scalene muscle inactivation by EMG- or ultrasound-guided local anesthetic injection is a very highly sensitive and specific diagnostic test confirming that NTOS is present. Intrascalenoe Botox chemodenervation not uncommonly results in complete relief of prior symptoms of NTOS for a period of 3 months. The development of recurrent NTOS symptoms in patients who have previously undergone first rib resection underscores the inadequacy of rib removal alone as a treatment for NTOS. The fact that a positive scalene block with local anesthetic in such patients predicts a favorable outcome with reoperation and brachial plexus neurolysis (Ambrad-Chalela et al, 2004)underscores the primacy of scalene muscle pathology in NTOS.

CONCLUSIONS: Rather than the cause of NTOS, the first rib is actually better considered a victim of the condition. Its removal alone does not suffice as treatment for this condition. Diagnostically and therapeutically, the focus for the proper treatment of NTOS should be on the pathologic scalene muscles. Their complete removal, and appropriate protection of the brachial plexus from postoperative scarring, should suffice in the management of the vast majority of patients with NTOS. The condition could more appropriately be named «myogenic thoracic outlet syndrome».
#18. EVAR: THE GIFT THAT KEEPS ON GIVING
Presenter: James C. Watson, MD
The Polyclinic
Seattle, Washington

BACKGROUND: Elective Endovascular Aortic Repair (EVAR) has the advantage of lower perioperative morbidity and mortality when compared with open repair. However, this comes with the need for lifelong surveillance, the added risk of late complications and the frequent need for reintervention.

METHODS: We report the case of the fourth EVAR done at Stanford, in 1997, and the subsequent interventions required.

RESULTS: After the index procedure the patient required an early separate placement of a proximal cuff at Stanford as well as four subsequent interventions including open aneurysm repair and additional interventions for component separation and bleeding.

CONCLUSION: Endovascular aortic aneurysm repair has small early morbidity and mortality advantages compared with open repair but when complications occur these advantages can disappear. There is clearly still a role for open aortic aneurysm repair.
#19. TRANSTHORACIC HYBRID REPAIR OF A COMPLEX SACCULAR THORACIC ARCH ANEURYSM BY BRANCH VESSEL RECONSTRUCTION AND TEVAR

D Pierce MD, D Neuzil MD, M Cecchini MD, G Lisse MD MPH
Presenter: Greg Lisse, MD
Virginia Mason Medical Center
Seattle, Washington

ABSTRACT: We performed a repair in a 67-year-old gentleman of a 6 centimeter aortic arch aneurysm using an antegrade TEVAR approach following transthoracic aortic branch vessel reconstruction. Prior to thoracic endografting, we performed a carotid subclavian bypass with ringed PTFE and innominate and left carotid artery bypass with bifurcated Dacron graft placed off of the ascending aorta. A thoracic endograft was then deployed via a 10mm Dacron conduit. Completion arteriogram demonstrated exclusion of the aneurysm and successful patency of our bypass grafts. This represents a unique transthoracic hybrid approach for repair of a complex ascending aortic arch aneurysm.

BACKGROUND: We performed a novel repair of a 6 centimeter ascending fusiform aortic aneurysm using an antegrade TEVAR approach following sternotomy and open debranching. The patient is a 67 year old man who was asymptomatic at presentation with a past medical history significant for hyperlipidemia and hypertension. We began his repair by performing a midline sternotomy with and pericardiotomy, then dissected the left subclavian and common carotid arteries. We then performed an end-to-end anastamosis of a 7mm ring PTFE graft to the subclavian artery followed by an anastamosis to the left common carotid. We then spatulated a 24x12 Dacron graft with a 10mm Dacron conduit. We then semi-cross clamped the ascending aorta and anastamosed our conduit to the left common carotid and innominate artery. We then cannulated the right femoral artery for deployment of a 36mm wide x 20cm long graft onto zone 0 of the thoracic aorta, just proximal to the innominate artery. We then placed a 38 x 15 graft inside of this and landed it right at the proximal innominate origin with the struts just past this but no cloth covering our graft. Completion angiogram demonstrated excellent flow into both vertebral arteries, common carotid arteries, and brain. To our knowledge, this is the first case report of such an operative approach, and importantly demonstrates the technical feasibility of antegrade TEVAR deployment in zone 0 through an intrathoracic graft repair.
#20. HYBRID TREATMENT OF MYCOTIC AORTIC ARCH ANEURYSM – A CASE

H Hajari MD
Presenter: Homayon Hajari, MD
Northwest Permanente PC Vascular and Endovascular Surgery, Kaiser Sunnyside Medical Center
Clackamas, Oregon

INTRODUCTION: Primary mycotic aneurysms are uncommon and account for 1-3 % of all thoracic aneurysms. Open surgery with debridement with insitu repair or extra anatomic bypass is considered as the first line therapy for most mycotic aneurysms of the aortic arch reserving Endovascular repair for (2) systemically unwell or unfit patients. In this case report, we describe the hybrid endovascular repair treatment of a primary mycotic aortic arch aneurysm.

CASE REPORT: 67 year old male with long standing chronic lymphocytic leukemia, hypogamaglobinemia and restrictive pericarditis and presented with fever, cough, hoarseness and recurrent bacteremia.

Three months earlier he has presented with a 6 weeks history of night sweats, weight loss, malaise, low back pain and new onset left hip pain. Given the history of malignancy a CT scan was obtained. The CT showed a distal abdominal aortic aneurysm with bilateral CIA aneurysm with fat stranding and peri-vessel inflammation. At that time, blood cultures were positive for strep pneumonia. He was initially treated with intravenous antibiotics and after control of sepsis, he underwent ligation of the infra renal aorta with excision of distal aorta and bilateral common iliac arteries and axillo bifemoral bypass graft. Intraoperative cultures confirmed strep pneumonia as the causative organism. He was then treated with 6 weeks of intravenous ceftriaxone and IVIG. At the time of his infrarenal aortic infection, CT scan demonstrated a small ulcer in the aortic arch, 2.3 cm X 2.1 cm. He then presented with fever, cough, hoarseness and malaise. Blood cultures grew a new bacteria (Moraxella) felt to be pulmonary in origin. CT showed expanding mycotic arch aneurysm 6 cm X 5.4 cm X 6.2 cm. He was deemed to be unfit for open surgery. He was treated with 6 weeks of Meropenem and Vancomycin. After 6 weeks a white cell nuclear scan showed no uptake surrounding the aorta. A repeat CT showed further expansion of the aneurysm 6.8 cm X 7.2 cm X 6.5 cm. He underwent hybrid repair, with arch debranching and endoluminal stent graft repair of the arch and proximal descending aorta. Post-operative course was complicated by multiple bilateral small cerebral infarcts on diffusion MRI. He was discharged on post-operative day 8. Postoperatively he completed 6 weeks of intravenous antibiotics and has continued on lifelong oral antibiotic to cover both organisms plus IVIG. Six months post-operatively, his hoarseness has resolved and he has mild memory loss and mild cognitive impairment with a follow up CT scan that shows near complete resolution of his aortic arch aneurysm.

DISCUSSION: Mycotic aneurysms of the aortic arch are rare and remain a life threatening condition. In patients unfit for open surgery, endovascular repair is reasonable if sepsis can be controlled. Similar anecdotal reports exist in the literature with similar successful medium term results.
#21. ENDOVASCULAR THERAPY FOR ANEURX GRAFT MIGRATION
Presenter: SL Tan, MD, PhD
Vascular & Surgical Care Northwest
Seattle, Washington

BACKGROUND: Migration of AneuRx aortic stent grafts has been well documented. The standard treatment for migration is surgical explantation. We report two cases where unique endovascular methods were used to reverse or prevent further migration in patients who were poor surgical candidates.

METHODS: CASE 1: An AneuRx stent graft migrated upward, partially occluding both renal arteries. The graft was repositioned downward by inserting a guidewire and catheter across the flow divider and gently applying tension. Further upward migration of the stent graft was prevented by placing renal stents into the renal arteries, but leaving the ends of the stents protruding into the aortic lumen.

CASE 2: An AneuRx stent graft migrated 3 cm downward, resulting in a Type I endoleak. Because the neck diameter was 40 mm, no abdominal aortic graft was available to exclude the aneurysm. Instead, a Cook TX2 graft was modified by cutting off the lowest stent segment. Aptus screws were used to affix one end of the TX2 graft to the aorta and the other to the AneuRx stent graft.

RESULTS: In both cases, AneuRx migration was successfully treated without surgical explantation of the stent graft. Both patients were followed for at least eighteen months without further observed migration or complications from the procedures.

CONCLUSION: The emergence of new endovascular technologies present opportunities for treating migration of stent grafts while avoiding their explantation.
#22. GIANT SYMPTOMATIC RIGHT SUBCLAVIAN ARTERY ANEURYSM
GA Wallace MD, NT Tran MD
Presenter: Gabriel Wallace, MD
Harborview Medical Center
University of Washington
Seattle, Washington

BACKGROUND: A 67 year old male presented to our institution with progressive right shoulder pain and right hand numbness. His history was notable only for a hypercoaguable disorder with remote DVT, PE, and mesenteric thrombosis for which he was therapeutically anticoagulated with warfarin. Physical examination showed normal perfusion of the right upper extremity with palpable right brachial and radial pulses. Chest xray revealed an asymmetric density in the right lung apex, which led to a CTA of the chest revealing a bilobar aneurysm of the right subclavian arterial aneurysm measuring 6.8 x 4.8 x 5.0cm with atherosclerotic calcifications and containing mural thrombus. Aneurysms of the left subclavian artery, descending aorta, and infrarenal aorta were also appreciated.

METHODS: The patient was evaluated and was not a candidate for endovascular repair due to location of the aneurysm as well as likely localized compression of his brachial plexus and carotid artery. Thus, he underwent open surgical repair with ligation of the aneurysm and arterial bypass using a bifurcated Dacron graft anastomosed to the proximal innominate artery, right common carotid artery, and right axillary artery via midline sternotomy with superolateral extension to the right neck and a separate right infraclavicular incision.

RESULTS: The operation was uncomplicated and the patient discharged to home on postoperative day 5. At 6 weeks post op, his presenting symptoms had resolved and Duplex ultrasonography revealed normal and symmetrical upper extremity segmental systolic pressures and a patent bypass graft with normal velocities in the graft and distal arteries. At 8 months out he continues to do well and remains symptom free.

CONCLUSION: Subclavian arterial aneurysm is a rarely encountered peripheral arterial aneurysm and should be repaired to prevent the complications of embolization, thrombosis and rupture. This can be safely and effectively accomplished with open surgical technique. Patients with peripheral arterial aneurysms should also be evaluated for the concurrent presence of other arterial aneurysms.
ABSTRACTS

#23. ENDOVASCULAR REPAIR OF BILATERAL ILLIAC ARTERY ANEURYSMS WITH A TRIFURCATED ENDOGRAFT
KR Kniery MD, FG Vladimir MD
Presenter: Kevin Kniery, MD
Madigan Army Medical Center
Tacoma, Washington

BACKGROUND: One of the foremost challenges with endovascular aortic repair (EVAR) of abdominal aortic aneurysms (AAA) has been unfavorable anatomy of the proximal and distal vessels. Approximately 40% of AAAs are associated with a unilateral iliac aneurysm, and 10% of AAAs have bilateral iliac aneurysms. Traditionally bilateral common iliac aneurysms preclude you from undergoing EVAR and necessitate an open repair. The difficulty arises when a patient has a AAA and bilateral iliac aneurysms and is not an operative candidate, what is the best treatment for them? Can you preserve internal iliac artery (IIA) flow with an endovascular repair? A few small studies have shown it is relatively safe to embolize the bilateral IIA, with a few and relatively minor complications such as buttocks claudication and impotence. Although there are the patients with severe coronary artery disease (CAD) and a poor ejection fraction that are thought to be at higher risk for severe complications such as ischemic colitis and pelvic devascularization. The current options to preserve IIA patency include; unilateral IIA embolization followed by an internal iliac branch graft device, unilateral IIA embolization with a trifurcated graft, relocation of the IIA origin, IIA bypass, bellbottom grafts, and external-to-internal iliac stent grafts with femoro-femoral cross-over.

METHOD: We report a case of a 79-year-old woman who presented with flank pain and hematuria and on CT scan was found to have large bilateral common iliac artery aneurysms (right 5.6cm, left 5.1 cm) along with a AAA (4.1cm). Her medical history was significant for morbid obesity; severe CAD with multiple prior myocardial infarctions with drug eluting stents in place, severe COPD, and a current smoker. She first underwent a right IIA embolization using coils Nester/Tornado four weeks prior. Then a modified Cook main body graft 22x82 was deployed in the left common iliac artery. This was followed by a Viabahn extension graft that was placed into the left internal iliac to preserve flow to the iliac arteries using two 13x50 grafts. A 24x82 Cook graft was then deployed at the level of the aortic aneurysm. A left limb iliac extension was placed using a 24x74 graft. A right limb iliac extension was placed using a 13x107 and 13x56 graft. The left common femoral artery was reconstructed using a bovine pericardium patch.

RESULTS: She did well postoperatively without any sequelae associated with bilateral iliac embolization. On postoperative imaging her aneurysms were excluded while maintaining IIA blood flow and no early evidence of an endoleak.

CONCLUSION: Common iliac aneurysms are classically repaired open, but in patients with severe comorbidities that preclude an open surgery there are safe ways to exclude the aneurysms while preserving the IIA blood flow with an endovascular repair.
#24. LAPROSCOPIC MANAGEMENT OF MEDIAN ARCUATE LIGAMENT SYNDROME: CASE REPORT

V Gunn MD, K Baxter MD
University of British Columbia
Vancouver, British Columbia

BACKGROUND: Median arcuate ligament syndrome (MALS) describes the symptoms of postprandial pain, weight loss and abdominal bruit that result from compression of the celiac artery or celiac ganglion by the median arcuate ligament. This is a controversial diagnosis, as the pathophysiology, diagnosis and treatment of the syndrome remain unclear. Treatment options include celiac artery decompression, celiac artery revascularization and celiac ganglion resection.

CASE REPORT: We describe a case of successful surgical treatment of MALS in a 19-year-old female. This patient had a 4-year history of recurrent episodes of abdominal pain. Her workup included extensive gastroenterologic evaluation, in addition to genetic testing for cystic fibrosis. CT imaging demonstrated celiac artery compression by the median arcuate ligament. High velocities through her celiac artery was found by Doppler ultrasound, and a celiac artery stenosis with a 26 mm Hg pressure gradient was found on conventional angiogram. With the diagnosis of MALS, the patient underwent laparoscopic release of the median arcuate ligament and a celiac ganglionectomy. The patient had an uneventful recovery and was discharged home on post-operative day 3. She had immediate symptom relief, and continues to be asymptomatic 1 year later.

CONCLUSION: Although results from treatment of MALS are often inconsistent, this report describes a successful case of surgical decompression and serves to review the literature describing the diagnosis and management of MALS.
#25. COMPRESSION OF THE SUPERIOR MESENTERIC ARTERY BY THE MEDIAN ARCUATE LIGAMENT: A UNIQUE CAUSE OF CHRONIC MESENTERIC ISCHEMIA

P Kreishman MD, Q Hatch MD, C Andersen MD
Presenter: Peter Kreishman, MD, Madigan Army Medical Center
Tacoma, Washington

BACKGROUND: Chronic Mesenteric Ischemia is a significant and potentially morbid cause of post-prandial abdominal pain, weight loss, and malnutrition. Most commonly, Chronic Mesenteric Ischemia arises as a result of atherosclerotic disease of the visceral aortic segment and the orifice of the superior mesenteric artery (SMA). We present a unique case of Chronic Mesenteric Ischemia caused by compression of the SMA by the median arcuate ligament.

METHOD: Our patient is a 58-year-old male with hypertension, hyperlipidemia, and a history of smoking who presents with several years of mild postprandial abdominal pain with progression for 3 months prior to presentation. The pain was severe and periumbilical, occurring 30-60 minutes after meals. His symptoms progressed to food fear, and he had lost 8 pounds the month prior to presentation. After unremarkable upper and lower endoscopy, abdominal CT was performed showing occlusion of the celiac trunk, High-grade non-atherosclerotic stenosis of the SMA, and a prominent median arcuate ligament surrounding the celiac axis and compressing the proximal SMA. Mesenteric duplex ultrasound confirmed stenotic velocities in the SMA and celiac trunk with reversal of flow in the common hepatic artery. There was no atherosclerosis in the SMA or visceral aortic segment. The patient was diagnosed with Median Arcuate Ligament Syndrome with compression of the SMA and was taken for laparotomy and median arcuate ligament release. After exposure of the supraceliac aorta the lesser sac was entered through the gastrocolic ligament, and the body of the pancreas was mobilized inferiorly. The median arcuate ligament completely encased the celiac axis and was carefully divided, exposing the origins of the celiac artery and SMA. Intraoperative duplex ultrasound revealed complete decompression of the proximal SMA. The celiac trunk remained stenotic but celiac revascularization was not performed. The patient was discharged to home on postop day #5 after an uneventful hospital course.

RESULTS: The patient’s post-prandial abdominal pain resolved completely. CT angiography revealed normal SMA anatomy and persistent high-grade stenosis of the celiac trunk. In the absence of symptoms, we did not pursue celiac stenting.

CONCLUSION: Median Arcuate Ligament Syndrome (MALS) involving the SMA is a rare cause of chronic mesenteric ischemia, causing symptoms more severe than typical MALS. Median arcuate ligament release with selective revascularization is an effective treatment strategy.
#26. GREATER SAPHENOUS VEIN ANEURYSMS: A RARE CASE OF GROIN SWELLING AND PULMONARY EMBOLISM
JD Crawford MD, JP Jundt MD, MI Foley MD, CC Huang MD, MF Barnatan MD, AD Nicoloff MD
Presenter: Jeffery D. Crawford, MD
Legacy Health Care System
Portland, Oregon

Greater saphenous vein aneurysms (GSVA) are a rare clinical entity often misdiagnosed as a lipoma, inguinal lymphadenopathy or inguinal hernia only to be correctly diagnosed at the time of operation. Rarely, an unrecognized GSVA may result in complications such as greater saphenous vein thrombosis, deep vein thrombosis (DVT), pulmonary embolism (PE), or death. We describe the case of a 38 year-old female who initially presented to a referring institution with bilateral groin swelling diagnosed as bilateral hernias. She was taken to the operating room for an elective left inguinal hernia repair with intraoperative diagnosis of greater saphenous vein aneurysm. No intervention was performed, the procedure was aborted and she was discharged home. Fourteen hours later the patient presented to the emergency room in extremis. The diagnosis of PE was made based on history and electrocardiogram findings. She was treated with immediate administration of tissue plasminogen activator, cardiopulmonary resuscitation, and extracorporeal membrane oxygenation (ECMO). Computed tomography angiogram of the chest demonstrated saddle embolus and venous duplex ultrasound diagnosed bilateral GSVA. She was continued on anticoagulation, weaned from ECMO and taken to the operating room for ligation of bilateral GSVA. The patient had a full recovery following the procedure and discharged to home 14 days after admission. This dramatic case presentation and literature review highlight several key concepts relevant to the management of GSVA: 1) GSVA are commonly misdiagnosed until operative exploration; 2) Venous aneurysms, including GSVA below the diaphragm are a significant risk factor for development of DVT and PE. Venous aneurysm should be considered in the differential diagnosis of groin masses and symptoms such as ease of compressibility, unusual location and presence of varicose veins. Duplex ultrasound is the preferred diagnostic modality and once the diagnosis is made we recommend ligation and removal of the saphenous vein aneurysm to minimize risk of DVT and PE.
BACKGROUND: Cystic adventitial disease (CAD) is a rare and often misdiagnosed pathology of the venous system. There are many reports on arterial CAD: the external iliac, femoral, ulnar, and popliteal arteries among others. The true incidence of venous CAD is unknown due to its rare occurrence and the literature is sparse with only case reports. This commonly leads to misdiagnosis as deep venous thrombosis and misdirected therapies. Several management options have been suggested ranging from percutaneous aspiration to complete surgical resection of the cyst with reconstruction.

METHOD: We report on a case of a 49-year-old male with acute onset cyanosis and swelling of the left lower extremity secondary to a 3 cm cyst causing near complete obstruction of the common femoral vein.

RESULTS: He underwent resection of the common femoral vein cyst with reconstruction using the profunda femoris vein.

CONCLUSION: We believe that surgical resection with reconstruction, as necessary, is the preferred treatment for symptomatic venous CAD. This recommendation is supported by the high recurrence rates of incomplete resection and failure of conservative therapies.
LOEYS-DIETZ SYNDROME, PREGNANCY AND AORTIC DEGENERATION
JD Crawford MD, MS Slater MD, TK Liem MD, GJ Landry MD, GL Moneta MD, EL Mitchell MD
Presenter: JD Crawford, MD
Oregon Health and Sciences University
Portland, Oregon

ABSTRACT: Loeys-Dietz Syndrome (LDS) is a rare autosomal dominant connective tissue disorder (CTD) caused by heterozygous mutations in the genes encoding transforming growth factor beta receptors (TGFBR) 1 and 2. The syndrome, characterized by vascular, skeletal, craniofacial and cutaneous manifestations, predisposes patients to aggressive and widespread vascular disease including aortic root dilation and arterial dissection. Women with LDS are prone to aortic dissection and uterine rupture during pregnancy and the postpartum period. Additionally, aortic disease is believed more aggressive during pregnancy as a result of estrogen-induced changes in the aortic media. We describe the case of a 29 year-old G2P1 woman at 28 weeks gestation presenting with abdominal pain. Work-up revealed a 7cm ascending aortic aneurysm and a DeBakey type 1 aortic dissection extending to the aortic bifurcation. Surgical management included concomitant Cesarean-section delivery of a live born premature infant, tubal ligation, ascending aortic replacement with reconstruction of the arch vessels and aortic valve replacement. This is the first reported case of aortic dissection with visceral involvement occurring in a patient with both LDS and pregnancy. This case highlights key concepts regarding etiology and management of acute aortic pathology in the setting of pregnancy and/or LDS including: the effects of pregnancy on aortic pathology, management of aortic pathology during pregnancy, diagnostic criteria for LDS and management of aortic pathology in patients with LDS and CTD.
POSTER #2
LISTERIA MONOCYTOGENES INFECTION OF A POPLITEAL ARTERY STENT GRAFT
AS Walker MD, CA Andersen MD, LJ Daab MD
Presenter: Joshua Smith, MD
Madigan Army Medical Center
Tacoma, Washington

ABSTRACT: Listeria monocytogenes is a pathogen associated with meningitis in the immunosuppressed patient. The pathogen is usually found in soft cheeses and raw milk. We present a case of an infected popliteal artery stent graft with Listeria monocytogenes. The report focuses on the diagnosis and treatment with surgical explantation and vascular reconstruction.
IMPACT OF ADJUNCT DISTAL REvascularization DURING COMMON FEMORAL ENDARTERECTOMY

BA Eslahpazir MS BSME, AT Rahman, JD Crawford MD, EL Mitchell MD, AF Azarbal MD, TK Liem MD, GL Moneta MD, GJ Landry MD
Presenter: Benjamin A. Eslahpazir MS
Oregon Health & Science University, Division of Vascular Surgery
Portland, Oregon

BACKGROUND: Treatment of peripheral arterial disease (PAD) with common femoral endarterectomy (CFE) in the presence of either inflow or outflow disease, is frequently encountered by the vascular surgeon. Concomitant CFE is often performed as an adjunct to revascularization during a distal bypass, an inflow procedure or as treatment alone. However, there is a paucity of long-term outcome or patency data of the CFE in these various situations. The aim of this study is to evaluate outcomes of the CFE when performed alone versus CFE with distal revascularization (DsR).

METHODS: A retrospective chart review using CPT codes identified 82 patients with 93 limbs treated with CFE alone or CFE+DsR at our institution between January 2005 and June 2014. Primary outcomes were freedom from revascularization, freedom from readmission and overall survival. Secondary outcomes were length of stay, post-operative complications, revisions of CFE segment and symptomatic improvement using the Rutherford-recommended 43 scale system. Categorical data were compared using Chi-Square analysis and continuous variables using one-way ANOVA. Survival analyses were computed using Kaplan-Meier and compared with Mantel-Cox Log Rank test.

RESULTS: Patients were divided into two groups: CFE alone (n=63) v CFE+DsR (n=30). Patients undergoing CFE+DsR had an overall higher Rutherford classification score compared to CFE alone (4.83±4.98 v 3.67±0.95) and were more likely to present with critical limb ischemia (86.7% v 42.9%). CFE without DsR was associated with superior symptomatic improvement (66.7%) compared to CFE+DsR (37.5%). Freedom from ipsilateral revascularization in the entire lower extremity was significantly improved for the CFE group compared to CFE+DsR (p=0.021). Freedom from readmission was also significantly improved for the CFE group (p=0.014). Length of stay was 7.4 days with CFE alone compared to 13.4 days with CFE+DsR (p<0.001). Similarly, the rate of post-operative complications was 25% in CFE alone versus 45% in CFE+DsR (p=0.028). However, there was no difference in need for revision of the CFE segment in the two groups (X2=0.389, p=0.53). Also, overall survival was not significantly different between the two groups (p=0.53).

CONCLUSION: This is the first study to directly evaluate the CFE segment during CFE alone v CFE+DsR. These findings confirm that patients with poor outflow requiring CFE+DsR have worse outcomes and less symptomatic improvement. However, the CFE segment is equally durable with or without implantation of a distal bypass graft.
POSTER #4
ENDOVASCULAR REPAIR OF CONCURRENT RUPTURED INFECTED THORACIC AND ABDOMINAL AORTIC ANEURYSMS: CASE REPORT
V Gunn MD, J Chen MD
Presenter: Virginia Gunn, MD
University of British Columbia
Vancouver, British Columbia

BACKGROUND: Infected aneurysms are rare, accounting for only 1-3% of all aortic aneurysms. Conventional surgical resection and debridement is associated with a high mortality rate, up to 43%. As such, endovascular management is an attractive alternative. We describe a case of endovascular repair of simultaneously ruptured infected thoracic and abdominal aortic aneurysms.

CASE: An 81-year old male with a 2-month history of recurrent abdominal and back pain was found to have a ruptured descending thoracic aneurysm ending 10 mm from the celiac axis, as well as a ruptured infrarenal abdominal aneurysm starting 13mm from the lowest renal artery. The infrarenal abdominal aneurysm was repaired by a combination of a PTFE-covered stent and aortic cuff endografts. The thoracic aortic aneurysm was treated with a thoracic endograft (30 x 80mm).

CONCLUSION: This case serves to review the literature and demonstrate that endovascular repair of infected aneurysms is a feasible alternative to open repair.
SURVEILLANCE FOR MORTALITY AND QUALITY OF LIFE IN PATIENTS WITH CYSTIC FIBROSIS

Mortality

- Mortality rates in Cystic Fibrosis (CF) have decreased significantly over the past decades due to improved medical care and management.
- However, despite this improvement, mortality remains higher in CF compared to the general population.
- The leading causes of death in CF include respiratory failure, liver disease, and infections.
- In addition to mortality, the quality of life in CF patients is also a significant concern.
  - The quality of life in CF patients is influenced by various factors including the severity of lung disease, the presence of liver disease, and the frequency of hospitalizations.
  - Individuals with more severe lung disease tend to have lower quality of life scores.
  - The presence of liver disease and frequent hospitalizations also have a negative impact on the quality of life.

Quality of Life

- Quality of life in CF patients is assessed using various questionnaires and scales.
- The most commonly used scales include the CFQ-R (Cystic Fibrosis Questionnaire-Revised), the St. George’s Respiratory Questionnaire, and the CFQ-7.
- Scores on these scales indicate the level of satisfaction with different aspects of life, such as physical health, emotional well-being, and social functioning.
- Low scores on these scales indicate a lower quality of life.

Conclusion

- Surveillance for mortality and quality of life in CF patients is crucial for understanding the impact of the disease on patients’ lives.
- Monitoring these outcomes helps in tailoring medical interventions and support to improve both the survival and quality of life in CF patients.

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POSTER #6
M.E.S.S. (MANGLED EXTREMITY SEVERITY SCORE): TIME FOR A REBOOT?
KH Johansen MD, PhD and ST Hansen Jr. MD
Presenter: Kaj Johansen MD, PhD
Swedish Medical Center
Seattle, Washington

BACKGROUND. In 1990 we published MESS (Mangled Extremity Severity Score), a clinical grading system designed to be determined early in the course of a trauma patient with a severely injured lower extremity. Based on 4 clinical criteria (extent and severity of bony/soft tissue injury, duration and severity of limb ischemia, presence and degree of shock, patient age), MESS was designed, and subsequently validated, to determine whether in such patients limb salvage should be attempted or alternatively that the patient should proceed to immediate primary amputation.

METHODS. Review of 72 papers published in the peer-reviewed medical, surgical or trauma literature (1991-2014) in which MESS is featured or referenced. These papers included trauma experiences in 12 different countries, in urban and rural settings and in both civilian and combat scenarios.

RESULTS. A large majority of papers using the MESS algorithm found it to be highly (or at least satisfactorily) predictive of the success of limb salvage efforts for a MESS value less than or equal to 7 — as originally indicated in our 1990 J. Trauma paper. A small minority criticized the concept of MESS, the methodology utilized to develop its algorithm or suggested suboptimal outcomes in clinical decision making associated with its use.

Over the past 5 years, this review demonstrates a trend toward an increasing likelihood of successfull limb salvage for MESS values >7.

CONCLUSIONS. In our original publication we emphasized that MESS was a clinical decision-making algorithm based on a «snapshot in time» based on urban trauma care in the late 1980s. Particularly in the context of several different theaters of war, trauma care has advanced remarkably in the quarter-century since MESS was published. It seems a certainty that some traumatized lower extremities which clearly needed primary amputation in 1990 warrant a robust effort at limb salvage 25 years later.

Accordingly, we call for a reassessment, through a rigorous prospective assessment, of current validated principles underscoring the decision to attempt limb salvage or alternatively to proceed with primary amputation in contemporary lower extremity, patients.

It’s time for MESS 2.0!
POSTER #7
ENDOVASCULAR REPAIR OF A BLUNT, TRAUMATIC AORTIC INJURY IN A PEDIATRIC PATIENT
MS Lallemand MD, T Curry MD
Presenter: MS Lallemand, MD
Madigan Army Medical Center
Tacoma, Washington

BACKGROUND: In the modern era of CT Scanning, blunt traumatic injuries that do not lead to immediate exsanguination, are being detected with increasing frequency. The literature supporting the use of endovascular techniques to repair these injuries, especially in the setting of other intraabdominal injuries, is sparse. The literature of this approach in pediatric patients is almost non-existent.

METHOD: This case-report presents a 14-year-old male who sustained a crush injury to the abdomen after being pinned between two motor vehicles, resulting in a traumatic injury to the aorta, as well as injuries to his small bowel and colon. He presented with ABIs of 0.7 bilaterally. The patient was found to have a large, central, retroperitoneal hematoma, which was not explored operatively. He underwent angiography and a 12mm, adult, peripheral arterial stent was placed across the defect in order to repair the injury.

RESULTS: The patient improved and subsequently recovered and is currently doing well. In this case, we found that the use of an endovascular approach to repair traumatic aortic injuries was safe and effective. This was complicated by the patient’s young age and growth potential, and the fact that stents designed for this age group are virtually non-existent.

CONCLUSION: An Endovascular approach for repair of traumatic aortic injuries is, in the short-term, safe and feasible, even in the pediatric population. The long-term outcome of this patient, or other patients in this subset is not well understood, particularly as this patient continues to grow and mature. There will need to be further follow up and evaluation in order to determine if this placement effects the growth of his aorta, if there are long term sequelae, or if the stent will need to be retrieved and possibly up-sized as the patient continues to grow and mature.
POSTER #8
FATAL SALMONELLA AORTITIS IN A PATIENT WITH VASCULAR TYPE EHLERS-DANLOS SYNDROME
D Nevidomskyte MD, C Latimer MD, S Shalhub MD MPH, D Reichenback MD, CL Fligner MD, MH Meissner MD
Presenter: D Nevidomskyte, MD
University of Washington
Seattle, Washington

BACKGROUND: Salmonella is the most common cause of infectious aortitis with high mortality rate due to the mycotic aneurysm rupture. The majority of the cases involve sites of pre-existing atherosclerotic aortic disease. A high index of suspicion is necessary for prompt diagnosis.

METHOD: We describe a unique case of fatal Salmonella aortitis leading to acute mycotic aneurysm rupture in a 53-year-old man with vascular Ehlers-Danlos syndrome (vEDS).

RESULTS: The patient was first diagnosed with vascular type EDS at the age of 36 and was followed for multiple vascular complications in the past. Most recently he presented after a trip to India with acute onset abdominal pain and was diagnosed with a new Type B thoracic aortic dissection (TBAD), which was managed medically. Over the next month he developed intermittent low-grade fever, abdominal pain, malaise, and night sweats. Follow up imaging and blood cultures were unremarkable. Due to ongoing symptoms patient was being reevaluated in the emergency room, when he suffered a cardiopulmonary arrest with unsuccessful resuscitation. Post mortem examination revealed a TBAD with acute mycotic aneurysm rupture distal to the left subclavian artery causing massive left hemothorax. Histology demonstrated necrotizing aortitis and gram-negative rods within the aortic wall, and the thrombus of the false lumen. Salmonella Kentucky not endemic to the region was isolated from pericardial fluid. This patient most likely harbored asymptomatic transient Salmonella bacteremia after having a short-lived diarrheal illness while visiting India. Bacterial colonization at the poorly perfused and partially thrombosed proximal portion of the TBAD led to necrotizing inflammation, subsequent aortic wall degeneration and acute mycotic aneurysm rupture.

CONCLUSION: This case exemplifies the ominous combined nature of both vEDS and Salmonella aortitis. Although surgical intervention in cases of infectious aortitis has improved survival and is a treatment of choice, the mortality rate remains high. This patient’s underlying vEDS would likely have made him a very high-risk surgical candidate. Endovascular repair is an emerging alternative and might be feasible in select patients.
POSTER #9
EVAR CANDIDACY IMPACTS THIRTY-DAY MORTALITY FOR REVAR BUT NOT FOR OPEN REPAIR OF RUPTURED ABDOMINAL AORTIC ANEURYSMS
BW Starnes MD, BT Garland MD, S Desikan MD, N Tran MD, E Quiroga MD, N Singh, MD
Presenter: Benjamin W. Starnes, MD
University of Washington
Seattle, Washington

OBJECTIVE: Few studies have looked at the impact of anatomic suitability for EVAR as it relates to overall mortality for ruptured AAA (rAAA). We reviewed our experience managing these patients with particular emphasis on imaging and endovascular candidacy as it relates to 30-day mortality.

METHODS: Data on all patients with rAAA presenting between January 1, 2002 and October 31, 2013 were collected. 95,751 images were reviewed by a single physician blinded to outcome or procedure with specific notation made on EVAR candidacy. Data were compared using Pearson Chi-Square Statistic with significance set at p<0.05.

RESULTS: 303 patients with rAAA presented over the study period. Of these, 235 patients had a pre-operative CT scan (78%). 215 had scans that were considered “evaluable”. Fifteen patients died either in the ED, en route to surgery, or after choosing comfort care. Of all 215 patients, 156 (73%) were considered candidates for EVAR (Get Franks Paper here). Mean aneurysm diameter was 82.4mm (range 37-182mm). Mean aortic neck diameter was 26.7mm (range 15-65) and length 17.2 (range 0-105). Table 1 describes 30-day mortality of patients based on procedure and candidacy for EVAR. When comparing all patients who underwent EVAR, EVAR candidates versus non-candidates had a significant survival advantage (77.6% vs 0%), p=0.0001. When comparing all patients who underwent open repair, there was no difference in mortality based on EVAR candidacy (49.2% vs 46.9%), p= 0.82.

CONCLUSIONS: Three fourths of patients with rAAA are candidates for EVAR using current devices. Patients with anatomy suitable for EVAR and subsequently undergoing EVAR have a significant survival advantage over those undergoing open repair and over those undergoing EVAR without suitable anatomy. Mortality for ANY open repair is high and does not differ based on EVAR candidacy. Those patients with anatomy unsuitable for EVAR should not undergo an attempt at endovascular repair with standard devices as the result is uniformly fatal at 30 days.
POSTER #10
OPERATING OUTSIDE OF THE COMFORT ZONE. A YOUNG WOMEN WITH A PROGRESSIVE, UNKNOWN COLLAGEN-VASCULAR DISORDER
BW VanderWel MD, SC Nicholls MD, TS Tan PhD
Presenter: Brandon VanderWel, MD
Swedish Medical Center
Seattle, Washington

ABSTRACT: We are presenting a patient who has required complex and unconventional vascular surgery management. Ms. D was a previously healthy female who presented at the age of 34 with a thoracic aortic aneurysm. Her family history is positive for her mother dying of aortic aneurysm rupture at 47 years old and a grandmother dying of sudden cause in her 4th decade. Exhaustive testing has only indicated that she has an unknown collagen-vascular disorder.

Age 34: Presented with an ascending aortic aneurysm requiring repair and suspension of aortic valve. Shortly after, the repair failed and she required a root replacement with porcine aortic valve replacement and reimplantation of coronary vessels.

Age 38: She underwent descending aortic repair from the upper descending thoracic aorta to the distal abdominal aorta with reimplantation of the celiac trunk, SMA, and renal arteries via Carrel patch. All the repairs were patent except the right renal artery. CTA at that time noted dissection of the great vessels and bilateral iliac arteries.

Age 44: Routine survey found the aorta to have grown to 5.6 cm, and underwent an arch replacement and elephant trunk procedure. She was lost to follow up before her thoracoabdominal aneurysm could be repaired.

Age 45: Presented one year later in renal failure and respiratory failure requiring intubation, and was found to have aneurysmal dilation of the Carrel patch obstructing the solitary left kidney. Ureteral stents were placed and her renal and respiratory failure resolved.

Age 47: Presented with abdominal pain and was found to have a colovaginal fistula secondary to diverticulitis and received a sigmoidectomy with colostomy. Three months later she again presented with abdominal pain and was found to have a 9.5 cm thoracic aortic aneurysm and a 6.0 cm abdominal aortic aneurysm at the Carrel patch. Her further management will be described in detail.
Constitution & Bylaws
Bylaws of Pacific Northwest Vascular Society
A Washington Nonprofit Corporation
(Revised 10/19/2012)

ARTICLE I
NAME OF CORPORATION
The name of the corporation shall be the “Pacific Northwest Vascular Society,” and it may sometimes be referred to in these Bylaws as the “Corporation.”

ARTICLE II
PURPOSES
The purposes for which the Corporation is formed are those set forth in its Articles of Incorporation.

ARTICLE III
PRINCIPAL OFFICE
The principal office of the Corporation shall be the office of the current secretary-treasurer. The Corporation may have such other offices as may, from time to time, be designated by its Board of Directors.

ARTICLE IV
MEMBERSHIP
A. VOTING RIGHTS. Each active member in good standing shall be entitled to one vote on each matter submitted to a vote of the members.

B. MEMBERSHIP. Membership shall be limited to physicians having an active practice in vascular disease. Members must meet one of the following requirements

1. Be certified by The American Board of Surgery.
2. Be a Fellow of The American College of Surgeons, or of the Royal College of Surgeons of Canada.
3. Hold a Certificate of Added Qualifications in Vascular and Interventional Radiology from the American Board of Radiology (or Canadian equivalent).
4. Be a member of the Society of Interventional Radiology.
5. Hold a Subspecialty Certificate in Cardiovascular Disease from the American Board of Internal Medicine (or Canadian equivalent).
6. Be a Fellow of the American College of Cardiology or the Society for Vascular Medicine and Biology.

Additionally, members must meet the requirements of one of the four classes of membership set out below.

C. CLASSIFICATION OF MEMBERSHIP. The members of the Corporation shall be divided into the following classes and shall be selected for membership based upon the criteria set out in connection with each class.

1. ACTIVE MEMBERS. All active members shall be physicians fulfilling membership requirements residing in the States of Alaska, Idaho, Washington, Oregon, Hawaii, and Montana, or the provinces of Alberta, British Columbia, and Saskatchewan, Canada.

Active members must fulfill at least one of the following criteria:

a. Hold a certificate of competence in general vascular surgery, vascular and interventional radiology, or cardiology as recognized in the United States or Canada;
b. Previous major contribution to the field of vascular disease;
c. Membership in the Society for Vascular Surgery, the International Society for Cardiovascular Surgery, the Society of Interventional Radiology, or the Society for Vascular Medicine and Biology;
d. Should a person desiring membership meet none of the above criteria, that person may submit a list a major vascular reconstructions or interventions which have been performed, and which should include, but need not be limited to, at least fifty (50) consecutive major vascular reconstructions or interventions, which list will be reviewed by the Membership Committee of the Corporation and if approved by the Membership Committee, the applicant’s name shall be in turn approved by the Board of Directors of the Corporation and the membership, pursuant to Paragraph D. of this Article.

2. ASSOCIATE MEMBERS. Associate membership shall be available to those who do not qualify for active membership, but who have an interest in vascular diseases. Candidates for such membership shall be proposed in writing to the Membership Committee through the Secretary-Treasurer and shall be selected pursuant to Paragraph D. of this Article.
3. SENIOR MEMBERS. Senior membership status shall be granted to active members who have retired from the active practice of medicine who have requested transfer of their membership status to senior status by submission of such request in writing to the Board of Directors. Senior members shall be excused from paying corporate dues.

4. HONORARY MEMBERS. Honorary members shall consist of individuals who have made significant contributions to the discipline of vascular disease or to the Corporation. Candidates for honorary membership shall be proposed in writing to the Membership Committee of the Corporation through the Secretary-Treasurer and shall be approved by the Board of Directors and the general membership pursuant to Paragraph D. of this Article. Honorary members shall be excused from paying corporate dues and shall not be required to meet the minimum annual meeting attendance requirements.

5. FOUNDING MEMBERS. All members joining the Corporation in the 1983 and 1984, shall be additionally classified as founding members.

D. SELECTION OF MEMBERSHIP. Any physician meeting the general membership requirements for membership may submit an application for membership in the Corporation, which shall be available from the Secretary-Treasurer of the Corporation upon request of any member. Completed application forms signed by the individual requesting membership, one sponsor member and two endorser members shall be delivered to the Secretary-Treasurer of the Corporation at least four (4) months prior to the annual meeting, provided however, the signatures of a sponsor member and two endorser members shall not be required on founding members’ applications. A non-refundable application fee determined by the Board of Directors shall be assessed each applicant. Applications received by the Secretary-Treasurer shall be reviewed by the Membership Committee of the Corporation which shall recommend acceptance or denial of the applicant’s request for membership in the Corporation. The names of all individuals who are recommended for membership by the Membership Committee shall be submitted to a vote of the Board of Directors and, if approved by the Board of Directors, shall in turn be submitted to a vote of the membership at the Corporation’s annual meeting, and shall be accepted as members upon receipt of a three-quarters (3/4) affirmative vote of the members present at the annual meeting.

E. CERTIFICATES OF MEMBERSHIP. Certificates or other evidence of membership in the Corporation may be issued. They shall exhibit the member’s name, his class of membership, and shall be signed by the President and Secretary-Treasurer of the Board of Directors of the Corporation.
F. STATUS OF MEMBERSHIP. Membership in the Corporation shall be personal, shall not survive the death of any individual member, and may not be transferred by any means. A member may resign at any time by written notice to the Corporation.

A member may be expelled for unprofessional or unethical conduct under the following circumstances. Charges of unprofessional or unethical conduct against any member of the Corporation which challenge that physician’s right to continued membership may be submitted by any member to the Board of Directors of the Corporation. Such charges must set forth specific grounds for such unprofessional or unethical conduct and must be in writing. The member whose conduct is being challenged shall be notified of the charge in writing and shall be provided with an opportunity to reply to the charge. Both the challenge and the member’s response shall be submitted to a vote of the Board of Directors who may expel such member by the affirmative vote of two-thirds (2/3) or more of the Directors. The Board of Directors’ vote shall be announced at the next annual meeting and may be overruled by a three-fourths (3/4) vote of those members present at the annual meeting.

In the event any active member’s dues shall remain unpaid for a period of one (1) year, such member shall be dropped from membership after giving notification to that member at least three (3) months prior to the effective date of lapse of such member’s membership.

G. ANNUAL MEETING. The annual meeting of the members shall be held at such time and at such place as shall be determined by the Board of Directors and shall be announced to the membership by written or printed notice stating the place, day and hour of any meeting, which shall be delivered either personally or by mail to the members not less than ten (10) nor more than thirty (30) days prior to the date of such meeting.

The deliberations of the Board of Directors shall be reported by the Secretary-Treasurer to the membership at the annual meeting. The reports of the Nominating Committee and Membership Committee as well as other committees shall also be presented to the membership during the annual meeting.

H. MEMBERSHIP ACTION WITHOUT MEETING. From time to time, other business may be transacted by ballot of the membership tabulated one month from date of mailing, subject to ratification by the full membership at the next annual meeting.
I. SPECIAL MEETINGS. Special meetings of the membership may be held at such time and at such place as shall be determined by the Board of Directors and shall be announced to the membership by written or printed notice stating the place, day and hour of any meeting which shall be delivered either personally or by mail to the members not less than ten (10) nor more than thirty (30) days prior to the date of such meeting.

J. QUORUM. The members present at a meeting shall constitute a quorum to transact the business of a meeting of the membership except as otherwise provided in the Articles of Incorporation or these Bylaws.

K. DUES. Initiation fees, dues and assessments shall be levied by the Board of Directors and approved by the membership at the annual meeting of the Corporation provided, however, honorary members and senior members shall be exempt from the payment of dues.

L. SCIENTIFIC SESSIONS. Corporation may, from time to time, sponsor scientific meetings, which may be attended by any physician, whether or not such physician is a member of the Corporation.

ARTICLE V
BOARD OF DIRECTORS

A. GENERAL POWERS. The affairs of the Corporation and its business and property shall be managed by its Board of Directors.

B. NUMBER AND QUALIFICATION OF BOARD OF DIRECTORS. The number of Board of Directors shall be not less than four (4) nor more than ten (10) and shall consist of the President, the President-Elect, the immediate Past President, the Secretary-Treasurer, and six (6) Directors who shall be elected at large from the membership.

C. TERM OF OFFICE. The members of the Board of Directors who are members by virtue of their office in the Corporation shall serve a term coincident with their term of office. The members of the Board of Directors who are Directors-at-large shall be elected to three-year terms. Initially, three-at-large members of the Board of Directors shall be elected, one to serve a three-year-term, one to serve a two-year-term, and one to serve a one-year-term. Due consideration shall be given to regional representation in electing such Directors.
D. REGULAR MEETINGS. The Board of Directors shall hold an annual meeting at the annual meeting of the membership of the Corporation, which shall be held without any other notice than this Bylaw. The Board of Directors may provide, by resolution, the time and place for holding additional regular meetings without other notice than such resolution. Financial support will be provided for active duty members of American and Canadian Armed Forces. The amount of support will be determined by the Executive Committee.

E. SPECIAL MEETINGS. Special meetings of the Board of Directors may be called at the discretion and pleasure of the President or upon written notice of any two (2) members of the Board of Directors. Such meetings shall be held at the principal office of the Corporation or at such other place as the director or directors calling the meeting of the Board of Directors shall be limited to the purpose or purposes stated in the notice of the meeting provided, however, if all members of the Board of Directors are present, other matters may be taken up by unanimous consent.

F. NOTICE. Notice of all meetings of the Board of Directors, with the exception of the regular annual meeting, shall be given to the Board members and Advisory Board members at least two (2) days before the meeting by written notice delivered either personally or sent by mail or electronic communication to each director at his address as shown on the records of the Corporation. Any director may waive notice of any meeting. The attendance of a director at any meeting shall constitute a waiver of notice of such meeting, except where a director attends a meeting for the express purpose of objecting to the transaction of any business to be transacted at the meeting need not be specified in the notice or waiver of notice of such meeting unless specifically required by law or by the Bylaws.

G. QUORUM. A minimum of one half (1/2) of the Board of Directors shall be required to constitute the quorum for transaction of business at any meeting of the Board of Directors. If less than this number of directors is present at any meeting, the majority of the directors present may adjourn the meeting from time to time without further notice.

H. BOARD DECISIONS. The act of a majority of the directors present at a meeting at which a quorum is present shall be the act of the Board of Directors.

I. COMPENSATION. Members of the Board of Directors shall not receive any stated salaries for their services. Nothing herein contained however shall be construed to preclude any director from serving the Corporation in any other capacity and receiving compensation therefor. By resolution of the Board of Directors, a fixed sum and expenses of attendance, if any, may be allowed for attendance at any regular or special meetings of the Board of Directors.
J. MINUTES. Minutes of all proceedings of the Board of Directors shall be maintained by the Secretary of the Corporation.

K. COMMITTEES. The President, upon the advice of the Board of Directors, may designate and appoint such committees as he may deem necessary, either as special or permanent committees, to assist him. The following committees shall be permanent committees: Membership Committee, Nominating Committee, Program Committee, Committee on Arrangements for the Annual Meeting, Auditing Committee and Bylaws Committee.

The Membership Committee shall consist of one (1) of the senior-at-large directors, who shall serve as chairman, and one (1) of the junior-at-large directors plus one (1) other member of the Corporation. The Secretary-Treasurer shall be an ex-officio member. The Committee shall recommend individuals to be proposed as members of the Corporation to the Board of Directors.

The Nominating Committee shall consist of the immediate Past President and the one (1) member of the Corporation appointed by the incoming President and shall nominate corporate officers to be submitted to a vote of the membership at the annual meeting. The Secretary-Treasurer shall be an ex-officio member.

The Program Committee, the Committee on Arrangements for the Annual Assembly, and the Auditing Committee shall be appointed annually by the incoming President with the advice of the Board of Directors, and shall serve a term which coincides with the term of the incoming President.

The Auditing Committee shall audit the books of the Corporation and present its report to the Corporation’s membership during the business portion of each annual meeting.

The Bylaws Committee shall consist of one (1) of the senior-at-large directors who shall serve as chairman, and one (1) of the junior-at-large directors plus one (1) member of the Corporation. The Secretary-Treasurer shall be an ex-officio member.

All committees shall be chaired by a member appointed by the President with the advice of the Board of Directors.

Chairman of the Membership Committee and the Bylaws Committee shall be appointed by the President from those members of the Board of Directors required by the Bylaws to be members of the respective committee.

L. GIFTS. The Board of Directors may accept, on behalf of the Corporation, any contributions, gift, bequest, or device for any purpose of the Corporation.
ARTICLE VI
OFFICERS

A. OFFICERS. The officers of the Corporation shall be a President, President-Elect, and Secretary-Treasurer. Such officers shall have the authority and perform the duties as prescribed from time to time by the Board of Directors.

B. ELECTION AND TERM OF OFFICE. The Nominating Committee shall submit a slate of proposed officers to the membership at the annual meeting and nominations may also be made by active members from the floor of the annual meeting. The officers of the Corporation shall be elected by majority vote of the active members from the active members of the Corporation at the annual meeting of the membership provided a quorum is present. The President-Elect shall be elected for a one (1) year term, and thereafter shall fulfill the office of the President for a one (1) year term. The Secretary-Treasurer shall be elected for a three (3) year term. Each such officer shall hold office until his successor has been duly elected and qualified.

C. POWERS AND DUTIES OF OFFICERS. The President shall supervise all activities of the Corporation, execute all instruments on its behalf, and preside at all meetings of the Corporation and the Board of Directors at which he may be present. He shall have such powers and shall perform such duties as may, from time to time, be specified in these Bylaws or in resolutions or other directives of the Board of Directors. He shall coordinate the work of the officers and committees of the Corporation in order that the purposes of the Corporation may be promoted and shall perform such duties as are usually inherent in such office. The President shall appoint the members of all standing and ad-hoc committees not otherwise appointed by those Bylaws, and shall serve as an ex-officio member of such committees. Successors to vacated offices of the Corporation shall be appointed by the President until the position is filled at the next annual meeting.

The President-Elect shall perform the duties of the President in the absence of the President, or in the case of the inability of the President to act, and shall perform such other duties as the President may designate. In the absence or incapacity of both the President and the President-Elect, the position shall be assumed by a President Pro-Term, elected by those members of the Board of Directors present at the meeting.

The Secretary-Treasurer shall keep the minutes of all meetings of the Corporation and of the Board of Directors and shall keep all other records of the Corporation. S/he shall be primarily
responsible for giving notice of all meetings held by the Corporation or the Board of Directors, shall conduct all correspondence of the Corporation, and shall issue written reports of the preceding year’s transactions to all members which shall be read to the Board of Directors and to the membership at the annual meeting. The Secretary-Treasurer shall have custody of all funds of the Corporation and shall keep a full and accurate account of the receipts and expenditures of the Corporation; shall make disbursements in accordance with the approved budget as authorized by the Corporation, the Board of Directors, or any committee; shall maintain bank accounts in the name of the Corporation in depositories designated by the Board of Directors; and shall render periodic financial annual Treasurer’s report for the membership and for audit by the Auditing Committee. The Secretary-Treasurer shall have such other powers and shall perform such other duties as may, from time to time, be specified in resolutions or other directives of the Board of Directors.

D. REMOVAL. Any officer may be removed by the Board of Directors whenever, in its judgment, the best interests of the Corporation would be served thereby.

E. VACANCIES. A vacancy in any office because of death, resignation, removal, disqualification, or other cause may be filled by the President of the Corporation for the unexpired portion of the term.

ARTICLE VII
BOOKS AND RECORDS
The Corporation shall keep correct and complete books of all proceedings of its membership, Board of Directors and committees having and exercising any of the authority of the Board of Directors, and shall keep, at the principal office of the Corporation, a recording giving the names and addresses of the members of the Corporation entitled to vote.

ARTICLE VIII
FISCAL YEAR
The fiscal year of the Corporation shall begin on the 1st day of January of each year and end at midnight on the 31st day of December of such year.
ARTICLE IX
SEAL
The Board of Directors shall provide a corporate seal which shall be a standard form with the name of the Corporation: “Pacific Northwest Vascular Society.”

ARTICLE X
INDEMNIFICATION
The Corporation shall indemnify any present or former director, officer, employee, or agent of the Corporation for expenses and costs (including attorney’s fees), actually and necessarily incurred by him in connection with the defense or settlement of any pending or threatened action, suit, or proceeding to which he is made a party by reason of his being or having been such official, except in relation to matters as to which he shall be finally judged to be liable for willful misconduct amounting to bad faith. Such indemnification shall not be deemed exclusive of any other right to which such indemnified person may be entitled under the Articles of Incorporation of Bylaws or under any agreement or vote of directors, insurance purchased by the Corporation, or other rights.

ARTICLE XI
CONSTRUCTION OF TERMS AND HEADINGS
Words used in these Bylaws shall be read as masculine or feminine gender and as the singular or plural, as the context requires. The captions or headings in these Bylaws are for convenience only and are not intended to limit or define the scope of effect of any provision of these Bylaws.

ARTICLE XII
WAIVER OF NOTICE
Whenever any notice is required to be given under the provisions of RCW Section 24.03 et seq., or under provisions of the Articles of Incorporation or the Bylaws of the Corporation, a waiver thereof in writing signed by the person or persons entitled to such notice, whether before or after the time stated therein, shall be deemed equivalent to the giving of such notice. All such waivers shall be filed with the corporate records or be made a part of the minutes of the relevant meeting.
ARTICLE XIII
AMENDMENTS
The Bylaws and the Articles of Incorporation of the Corporation may be amended, altered, or repealed at the annual meeting of the Corporation by a two-thirds (2/3) affirmative vote of the members present, provided there is a quorum of the membership present at such meeting. For the purpose of amending, altering, or repealing the Bylaws, a quorum shall consist of one-third (1/3) of the Active members of the Corporation.

KNOW ALL MEN BY THESE PRESENTS: The undersigned Secretary of Pacific Northwest Vascular Society does hereby certify that the above and foregoing Bylaws of said Corporation were duly adopted by the Board of Directors as the Bylaws of the Pacific Northwest Vascular Society and that the same do now constitute the Bylaws of said Corporation.

Dated this 19th day of October, 2012
Benjamin W. Starnes, MD
Secretary-Treasurer
2014 Membership
Robert L. Acker, MD, FACS (Senior)
18475 NE Smith Road
Newberg, OR 97132
Tel: 503-284-6943
Fax: 503-284-3977
Email: ackerpa@pol.net

Bruce A. Adye, MD (Active)
520 Mary Street
Suite 520
Evansville, IN 47724-1682
Tel: 812-424-8231
Fax: 812-464-8352
Email: b80@insightbb.com

Richard Alquist, MD (Senior)
1903 E. Rockwood Boulevard
Spokane, WA 99203

Charles A. Andersen, MD, FACS (Active)
Madigan Army Medical Center
Chief, Vascular Surgery
MAMC / Department of Surgery
Tacoma, WA 98431
Tel: 253-952-2135
Fax: 253-952-8816
Email: cande98752@aol.com

John S. Arthur, MD, FACS (Active)
Kitsap Thoracic & Vascular Inc, PS
PO Vox 2186, #101
Bremerton, WA 98310-0255
Tel: 360-479-2400
Fax: 360-479-2401
Email: jsamdp@aol.com

James W. Asaph, MD, FACS (Senior)
4401 S.W. Westdale Drive
Portland, OR 97221-3158
Tel: 503-215-2300
Fax: 503-215-2333
Email: mrnous@aol.com

Keith Baxter, MD (Active)
Vancouver General Hospital
Room 4211
2775 Laurel St
Vancouver, BC V5Z 1M9
CANADA
Tel: 604-875-5538
Fax: 604-875-5542
Email: keith.baxter@vch.ca

George Beito, MD, FACS (Active)
321 3rd Street
Kirkland, WA 98033
Tel: 425-883-5461
Fax: 425-883-5547
Email: gnbeito@hotmail.com

R. Thomas T. Bergman, MD, FACS (Active)
Wenatchee Valley Medical Center
820 North Chelan Avenue
Wenatchee, WA 98801
Tel: 509-663-8711
Fax: 509-665-2315
Email: tbergman@wvmc.com
Roger P. Bernard, MD (Senior)
45 High Oak Drive
Medford, OR 97504
Tel: 541-779-0293
Fax: 541-779-0293
Email: rolabern@aol.com

George A. Berni, MD (Active)
Harrison Memorial Hospital
1225 Campbell Way, Suite 101
Bremerton, WA 98310
Tel: 360-479-4203
Fax: 360-478-7240
Email: ggberni@wavecable.com

Jeffrey D. Bernstein, MD, FACS (Active)
The Doctors Clinic Salmon Medical Center
2200 NW Myhre Road
Salmon Medical Center
Silverdale, WA 98383
Tel: 360-830-1251
Fax: 360-830-1289
Email: jeffreybernstein@mac.com

Duane S. Bietz, MD (Senior)
1221 SW 10th Avenue
Suite 901
Portland, OR 97205
Tel: 503-296-4136
Fax: 503-233-1602
Email: heartbietz@comcast.net

David H. Bingham, MD (Associate)
Bryan/LGH Hospital
1500 South 48th Street
Suite 400
Lincoln, NE 68506
Tel: 402-481-8500
Fax: 402-481-8501
Email: user238815@aol.com

Kenton C. Bodily, MD, FACS (Active)
Cascade Vascular Associates, PS
1802 S. Yakima Avenue
Suite 204
Tacoma, WA 98405-5304
Tel: 253-383-3325
Fax: 253-572-7875
Email: kbod2004@yahoo.com

William A. Bourland, MD (Active)
Veteran Affairs Medical Center
500 W. Fort Street
Boise, ID 83702
Tel: 208-378-2834

Milton H. Brinton, MD (Active)
The Woodlands Vein And Laser Center
6627 Pinebrook Bridge Lane
Spring, TX 77379
Tel: 281 885 9207
Email: brintonmh@gmail.com
James D. Buttorff, MD, FACS (Active)
Multicare Medical Association
409 South L
Suite 204
Tacoma, WA 98405
Tel: 253 403 8410
Fax: 253-572-7876
Email: cvajdb@harbornet.com

Kim Cantwell, NP (Active)
SW Washington Medical Group, PS
312 SE Stationmill Drive, Suite 160
Vancouver, WA 98664

Pam Charboneau, ARNP (Associate)
Franciscan Vascular Associates – Tacoma
1802 So. Yakima
Suite 204
Tacoma, WA 98405
Email: pamcharboneau@fhshealth.org

Jerry C. Chen, MD (Active)
University of British Columbia
2775 Laurel Street
Suite 4203
Los Angeles, BC V5Z 1M9
CANADA
Tel: 604-875-5535
Fax: 604-875-5542
Email: jerry.chen@vch.ca

Kathleen Clapp, MD (Active)
ZymoGenetics, Inc.

Alexander W. Clowes, MD, FACS (Active)
University of Washington School of Medicine
PO Box  356410
Seattle, WA 98195-6410
Tel: 206-598-9760
Fax: 206-598-1466
Email: clowes@u.washington.edu

James M. Cook, MD (Active)
Radia
1330 Rockefeller Avenue
Suite 520
Everett, WA 98201
Tel: 425-297-5200
Fax: 425-297-5210
Email: jcook@radiax.com

Joseph A. Davis, MD (Active)
Sacred Heart Medical Center
122 West 7th Avenue
Suite 420
Spokane, WA 99204
Tel: 509-838-8286
Fax: 509-625-1888
Email: josephadavis@comcast.net

David M. Deitz, MD, FACS (Active)
South Sound Surgical Associates
3920 Capital Mall Drive SW
Suite 203
Olympia, WA 98502-8702
Tel: 360-754-3507
Fax: 360-236-1457
Email: femtib@aol.com
John N. Diaconou, Vascular Surgeon (Active)
Northwest Vascular Center
710 S. 348th Street
Suite A
Federal Way, WA 98003
Tel: 253-833-8032
Fax: 253-833-8081
Email: johndiaconou@fhshealth.org

D. Lynn Doyle, MD (Senior)
British Columbia
CANADA
Tel: 604-874-7888

William C. Duncan, III, MD, FACS (Senior)
5400 Menefee Drive
Portland, OR 97239
Tel: 503-246-5333
Email: william.duncan@comcast.net

Mark A. Eaton, MD, FACS (Active)
Rogue Valley Medical Center
520 Medical Center Drive
Suite 300
Medford, OR 97504-4316
Tel: 541-282-6680
Fax: 541-282-6681
Email: 555eaton@charter.net

James M. Edwards, MD (Active)
Portland VAMC/OHSU
3710 US Veterans Hospital Road
P-3-OCDa
Portland, OR 97239
Tel: 503-220-8262
Fax: 503-220-3415
Email: edwardsj@ohsu.edu

William E. Faught, MD, FACS (Active)
520 Medical Center Drive
Suite 300
Medford, OR 97504
Tel: 541-280-6680
Email: Melissf@charter.net

Peter M. Feldman, MD, FACS (Active)
2132 S.W. 17th Avenue
Portland, OR 97201-2311
Tel: 503-241-0534

Brian L. Ferris, MD (Active)
Lake Washington Vascular, PLLC
1135 116th Avenue N.E.
Suite 305
Bellevue, WA 98004
Tel: 425-453-1772
Email: drferris@lkvw.com
John J. Ford, Jr., MD, FACS (Senior)
1203 Madrona Avenue
Everett, WA 98203
George S. Fortner, MD (Active)  
Peace Health St. John Medical Center  
1615 Delaware Street  
Suite 200  
Longview, WA 98632  
Tel: 360-425-5160  
Email: gfortner@peacehealth.org

Andrew T. Gentile, MD (Active)  
10100 South East Sunnyside Road  
Clackamas, OR 98015  
Tel: 503-786-8435  
Fax: 503-571-3069

Gerald E. Gibbons, MD (Senior)  
2642 School Street  
Wenatchee, WA 98801  
Tel: 509-663-8711  
Email: gegibbons@nwi.net

Kathleen D. Gibson, MD, FACS (Active)  
Lake Washington Vascular, PLLC  
1135 116th Avenue N.E.  
Suite 305  
Bellevue, WA 98004  
Tel: 425-453-1772  
Fax: 425-453-0603  
Email: drgibson@lkvw.com

Jeffrey J. Gilbertson, MD (Active)  
St. Lukes Cardiothoracic and Vascular Associates  
333 N. First Street  
Suite 280  
Boise, ID 83702  
Tel: 208-345-6545  
Fax: 208-345-1213  
Email: jjon@cardvasc.com

Richard A Gingrich, MD, FACS (Senior)  
14232 NE Fremont  
Portland, OR 97230  
Tel: 503-256-1575  
Fax: 503-253-9848

George W. Girvin, MD, FACS (Senior)  
4203 S. Perry Street  
Spokane, WA 99203

Roger W. Hallin, MD, FACS (Senior)  
12080 S.W. Terwilliger  
Portland, OR 97219  
Fax: 503-635-7688  
Email: tzty41a@teleport.com

Leland J. Harris, MD (Senior)  
WA  
Tel: 425-885-0808  
Fax: 425-453-7792

Thomas Hatsukami, MD (Active)  
University of Washington  
325 9th Avenue  
Box 359908  
Seattle, WA 98104  
Tel: 206-744-8041  
Fax: 206-744-6794  
Email: tomhat@uw.edu
Annette M. Holmvang, MD (Active)
Richmond Hospital
6051 Gilbert Road
Suite 207
Richmond, BC V7C 3V3
CANADA
Tel: 604-276-0952
Fax: 604-231-0583
Email: aholmvang@shaw.ca

Gord T.M. Houston, MD (Active)
7031 Westminster Highway
Suite 307
Vancouver, BC V6X 1A3
CANADA
Tel: 604-270-2726
Fax: 604-270-1434
Email: ghrh@telus.net

York Nien-Hsiung Hsiang, MD (Active)
University of BC
943 West Broadway, #510
Vancouver, BC V5Z 1K3
CANADA
Tel: 604-876-5882
Fax: 604-878-8085
Email: ynhsiang@yahoo.ca

Toshio Inahara, MD, FACS (Senior)
1115 S.W. Summit View Drive
Portland, OR 97225
Fax: 503-297-6817

Alastair Jamieson, MD (Senior)
6978 Fremlin Street
Vancouver, BC V6P 3W4
CANADA

Kenneth A. Janoff, MD, FACS (Active)
Mt. Hood General & Vascular Surgeons
5050 N.E. Hoyt Street
Suite 411
Portland, OR 97213
Tel: 503-239-4324
Fax: 503-239-5572
Email: kathyp411@hotmail.com

Kaj H. Johansen, MD, FACS (Active)
Swedish Heart & Vascular Institute
1145 Broadway
Suite 400
Seattle, WA 98122
Tel: 206-320-3100
Fax: 206-320-3188
Email: kaj.johansen@swedish.org

Morris G. Johnson, MD, FACS (Active)
1400 E. Kincaid Street
Mount Vernon, WA 98274
Tel: 360-428-2586
Fax: 360-428-2560
Email: mjohnson@srclinics.org

Mark L. Johnson, MD, FACS (Active)
1400 E. Kincaid Street
Mount Vernon, WA 98273
Tel: 360-428-2586
Fax: 360-428-6470
Email: mljohnson@svmc.net
Michael A. Judd, MD (Active)  
NW Heart-Lung Surgical Assoc.  
122 West 7th Avenue  
Suite 110  
Spokane, WA 99204-2301  
Fax: 509-838-2960

Andris Kazmers, MD, FACS (Associate)  
521 Monroe Street  
Suite 140  
Petoskey, MI 49770  
Tel: 231-487-1900  
Fax: 231-348-1074  
Email: akazmers@excite.com

John W. Kenagy, MD, FACS (Senior)  
Kenagy and Associates, LLC  
3 Indian Hill Road  
Belmont, MA 2478  
Tel: 617-489-3937  
Email: JOHN@JOHNKENAGY.COM

Todd K. Kihara, MD, FACS (Active)  
Franciscan Vascular Associates - Tacoma  
1802 S. Yakima Avenue, Suite 204  
Tacoma, WA 98405  
Tel: 253-382-8540  
Fax: 253-382-8545  
Email: toddkihara@phshealth.org

James T. King, Jr., MD, FACS (Active)  
4135 Riva De Tierra Lane  
Las Vegas, NV 89132  
Email: macriv@attbi.com

Richard N Kleaveland, MD (Senior)  
WA  
Fax: 509-625-1888

Ted R. Kohler, MD, FACS (Active)  
Puget Sound Healthcare System 112V  
Department of Veteran Affairs  
1660 South Columbian Way  
Seattle, WA 98108  
Tel: 206-764-2245  
Fax: 206-764-2529  
Email: kohler@u.washington.edu

David Kopriva, MD (Active)  
Regina General Hospital/University of Saskatchewan  
1440 14th Avenue  
Regina, SK S4P 0W5  
CANADA  
Tel: 306-766-6900  
Fax: 306-766-6920  
Email: dkopriva@sasktel.net

Richard Merle Kremer, MD, FACS (Associate)  
PO Box 33330  
Seattle, WA 98133  
Tel: 425-744-1405  
Fax: 425-744-1405  
Email: rmkmd@prodigy.net
**Greg J. Landry, MD, FACS (Active)**
Oregon Health & Science University
3181 SW Sam Jackson Park Road
OP-11
Portland, OR 97239-3098
Tel: 503-494-7593
Fax: 503-494-4324
Email: landryg@ohsu.edu

**Brian C. Lange, MD, FACS (Active)**
801 Broadway
Suite 522
Seattle, WA 98122
Tel: 206-682-6087
Fax: 206-343-7190
Email: blange@vascularassociatesps.com

**Andre J. Lasalle, MD, FACS (Active)**
Rockwood Clinic, PS
910 W. 5th Avenue
Spokane, WA 99220
Tel: 509-838-2531
Email: aklasalle@comcast.net

**David M. Lauter, MD, FACS (Active)**
1600 116th Avenue NE
Suite 304
Bellevue, WA 98004
Tel: 425-453-7888
Fax: 425-453-7899
Email: lauter@laparoscopyNW.com

**David K. Lawlor, MD FRCSC FACS (Active)**
Kelowna General Hospital
5529 Farron Place
Kelowna, BC V1W 5H1
CANADA
Tel: 250-762-7731
Fax: 250-762-7502
Email: Dr.D.Kirk.Lawlor@interiorhealth.ca

**Shung Lee, MD (Active)**
Dooner & Lee Vascular Surgery
1120 Yates Street
Suite 405
Victoria, BC V8V 3M9
CANADA
Tel: 250-384-8154

**Timothy K. Liem, MD, FACS (Active)**
Oregon Health & Science University
3181 SW Sam Jackson Park Road
OP-11
Portland, OR 97239-3098
Tel: 503-494-7593
Fax: 503-494-4324
Email: liemt@ohsu.edu

**James R. Lohse, MD, FACS (Active)**
Peacehealth
2950 Squalicum Parkway
Bellingham, WA 98225
Tel: 360-788-6063
Fax: 360-788-6817
Email: jlohse@peacehealth.org
Shaun Macdonald, MD (Active)
St. Pauls Hospital
1081 Burrard Street
Vancouver, BC V6Z 1Y6
CANADA
Tel: 604-806-8698

Chuck McQuinn, MD (Active)
2347 34th Ave S
Seattle WA 98144
Email: cmcquinn@comcast.net

Gary Matsumoto, MD (Active)
Spokane Surgical Group, Inc.
910 W. 5th Avenue
Suite 550
Spokane, WA 99204
Tel: 509-747-6194
Fax: 509-747-4313

Brian D. Matteson, MD, FACS (Active)
St. Lukes Cardiothoracic and Vascular Associates
333 N. First Street
Suite 280
Boise, ID 83702
Tel: 208-345-6545
Fax: 208-345-1213
Email: bmatteson@slhs.org

W. Burley McIntyre, MD, FACS (Active)
Radia
7003 Dayton Avenue North
Seattle, WA 98103
Tel: 425-258-4624
Fax: 425-259-1063
Email: bmcintyre@radiax.com

Mark H Meissner, MD, FACS (Active)
University of Washington
1959 NE Pacific Street
Dept. of Surgery, Box 356410
Seattle, WA 98195
Tel: 206-598-1059
Fax: 206-598-1466
Email: meissner@u.washington.edu

Erica Leith Mitchell, MD (Active)
Oregon Health & Science University
Division Vascular Surgery
3181 SW Sam Jackson Park Road
OP-11
Portland, OR 97239
Tel: 503-494-7593
Fax: 503-494-4324
Email: mitcheer@ohsu.edu

Gregory L. Moneta, MD, FACS (Active)
Oregon Health & Science University
3181 SW Sam Jackson Park Road
OP-11
Portland, OR 97239
Tel: 503-494-7593
Fax: 503-494-4324
Email: monetag@ohsu.edu

Charles Morrow, MD (Active)
Mt. Hood General & Vascular Surgeons
5050 N.E. Hoyt Street, Suite 511
Portland, OR 97213
Tel: 503-232-0942
Fax: 503-232-4950
Stephan C. Mostowy, MD, FRCS (Active)
Kelowna General Hospital
616 KLO Road, Suite 205
Kelowna, BC V1Y 4X4
CANADA
Tel: 250-762-7731
Fax: 250-762-7502
Email: stephan.mostowy@gmail.com

Dipankar Mukherjee, MD, FACS (Associate)
Vascular Surgical Associates, PC
3022 Williams Drive, Suite 100
Fairfax, VA 22031
Tel: 703-280-5858
Fax: 703-849-0874
Email: muk1953@aol.com

Thomas O. Murphy, MD, FACS (Senior)
161 Maple Lane NW
Gig Harbour, WA 98335-5949
Tel: 253-265-3661
Fax: 253-265-3498
Email: sundance@harbornet.com

Stephen P. Murray, MD (Active)
Providence Inland Vascular Institute
122 West 7th Avenue, Suite 420
Spokane, WA 99204
Tel: 509-838-8286
Fax: 509-625-1888
Email: vsurg@mac.com

Ryan Nachreiner, MD (Active)
Sacred Heart Medical Center
122 West 7th Avenue
Suite 420
Spokane, WA 99204
Tel: 509-838-8286
Fax: 509-625-1888
Email: rnachreiner@inlandvascular.com

Daniel F. Neuzil, MD, FACS (Active)
Virginia Mason Medical Center
816 E. Shelby
Seattle, WA 98102
Tel: 206-223-6637
Fax: 206-625-7245
Email: daniel.neuzil@vmmc.org

Stephen C. Nicholls, MD, FACS (Active)
SW Washington Medical Center
200 NE Mother Joseph Place
Suite 330
Vancouver, WA 98664
Tel: 360-514-1854
Fax: 206-731-6794
Email: stevenic@u.washington.edu

Alexander D. Nicoloff, MD (Active)
501 N. Graham Street, #415
Portland, OR 97227-2006
Tel: 503-413-3580
Aksel G. Nordestgaard, MD, FACS (Active)
NW Vein & Aesthetic Center, PS
7502 Ford Drive
Gig Harbor, WA 98335
Tel: 253-857-8346
Fax: 253-572-7875
Email: a.nordy@comcast.net

Peter F. Noyes, MD, FACS (Active)
748 State Street
Medford, OR 97501
Tel: 541-779-0837
Fax: 541-779-8873
Email: noyespete@juno.com

Robert W. Osborne, MD (Active)
Cascade Vascular Associates, PS
3201 17th Street Pl SE
Puyallup, WA 98374
Tel: 253-279-0254
Fax: 253-572-7875
Email: osborne.rw@gmail.com

Jeff Pasenau, MD (Active)
Kelowna Vascular Associates
616 KLO Road, Suite 205
Kelowna, BC V1Y 4X4
CANADA
Tel: 250-762-7731
Fax: 250-762-7502
Email: jeff@pasenau.com

James J. Peck, MD, FACS (Active)
Oregon Medical Board
1500 SW 1st Avenue, Suite 620
Portland, OR 97201-6051
Tel: 503-679-2988
Fax: 503-297-3138
Email: jamesjpeck@gmail.com

Thomas R. Pellow, MD, FACS (Active)
Sacred Heart Medical Center
122 West 7th Avenue, Suite 420
Spokane, WA 99204
Tel: 509-838-8286
Fax: 509-625-1888
Email: thomas.pellow@providence.org

Daniel Pepper, MD (Active)
Lake Washington Vascular, PLLC
1135 116th Avenue N.E., Suite 305
Bellevue, WA 98004
Tel: 425-453-1772
Fax: 425-453-0603
Email: drpepper@lkwv.com

Rick D. Pittman, MD (Active)
Salem Vein & Aesthetics Center
1535 Liberty Street SE
Salem, OR 97302-4345
Tel: 503-370-8346
Fax: 866-371-8334
Email: drrick@salemvascular.com
2014 MEMBERSHIP

Terence M. Quigley, MD, FACS (Active)
Seattle Pacific Surgeons
1560 N. 115th Street
Suite 102
Seattle, WA 98133
Tel: 206-368-1070
Fax: 206-303-4172
Email: Tquigley@NWHSEA.org

Edmond J. Raker, MD (Active)
Virginia Mason Medical Center
1100 9th Avenue, BUCK 6
Seattle, WA 98101
Tel: 206-223-6950
Fax: 206-341-0049
Email: gtsejr@vmmc.org

M. Kathleen Reilly, MD (Active)
Sacred Heart Medical Center
122 West 7th Avenue
Suite 420
Spokane, WA 99204
Tel: 509-838-8286
Fax: 509-625-1888
Email: kreilly@inlandvascular.com

Justin A. Robinson, MD, FACS (Senior)
Yakima Vascular Associates
4606 Fechter Road
Yakima, WA 98908
Tel: 509-972-5484
Fax: 509-248-9964
Email: spaderbay@hotmail.com

Anthony J. Roon, MD, FACS (Senior)
4014 Mission Beach Drive
Tulalip, WA 98271
Tel: 425-261-3037
Fax: 425-261-3030
Email: ajrfacs@aol.com

Glen S. Roseborough, MD (Active)
Salem CardioVascular Associates, P.C.
885 Mission Street SE
Salem, OR 97302
Tel: 503-485-2337
Fax: 503-587-7823
Email: g.roseborough@salemcardiovascular.com

Anthony J. Salvian, MD (Active)
Pacific Vein Clinic
1214-750 Broadway West
Vancouver, BC V5Z 1J2
CANADA
Tel: 604-874-0532
Fax: 604-874-7806
Email: salvian@pop.interchange.ubc.ca

Lester R. Sauvage, MD (Senior)
The Hope Heart Institute
550 17th Avenue
Suite 410
Seattle, WA 98122-4798
Tel: 206-903-2254
Fax: 206-903-2744
Richard A. Schwartz, MD, FACS (Active)
29555 Bates Toad
Perrysburg, OH 43551
Tel: 360-779-2965

Mohammad Sharif, MD, FACS (Active)
Surrey Memorial Hospital
9656 King George Highway
Surrey, BC V3T 2V5
CANADA
Tel: 604-588-1144
Fax: 604-588-1144
Email: surgsharif@yahoo.com

Niten Singh, MD (Active)
Madigan Army Medical Center
9040 -A- Fitzsimmons Drive
Tacoma, WA 98431-1100
Tel: 253-968-2290
Fax: 253-968-5997
Email: singhn2@uw.edu

Joseph G. Sladen, MD (Senior)
3204 West 26 Avenue
Vancouver, BC V6L 1W1
CANADA
Fax: 604-731-4081
Email: jsladen@interchange.ubc.ca

Christopher Stahler, Jr., MD, FACS (Senior)
Wenatchee Valley Clinic
820 North Chelan Avenue
Wenatchee, WA 98801
Tel: 509-663-8711
Fax: 509-664-7178
Email: skylineMC@aol.com

Benjamin W. Starnes, MD, FACS (Active)
University of Washington
410 Ninth Avenue
Box 359908
Seattle, WA 98106
Tel: 206-744-3033
Fax: 253-968-0232
Email: starnes@uw.edu

David L. Street, MD, FACS (Active)
Oregon Surgical Specialists, PC
520 Medical Center Drive
Suite 300
Medford, OR 97504-4316
Tel: 541-779-0837

Brian D. Stringer, MD (Active)
1915 Randolph Road
Charlotte, NC 28207

Leonard T. Su, MD (Active)
Lake Washington Vascular, PLLC
1135 116th Avenue N.E.
Suite 305
Bellevue, WA 98004
Tel: 425-453-1772
Fax: 425-453-0603
Email: drsu@lkvw.com
Matthew Sweet, MD (Active)
University of Washington
1959 NE Pacific Street
Box 356410
Seattle, WA 98195
Tel: 206-598-1154
Fax: 206-598-1466
Email: mpsweet@uw.edu

Jeffrey B. Symmonds, MD, FACS (Active)
6140 Curtisian Avenue
Boise, ID 83704
Tel: 208-364-3000
Fax: 208-364-3191
Email: jbsymms@cableone.net

Shelley Takahashi, MD (Active)
CA

Swee Lian Tan, MD, PhD, FACS (Active)
Vascular and Surgical Care Northwest
600 Broadway, Suite 112
Seattle, WA 98122
Tel: 206-420-3119
Fax: 206-453-5912
Email: sweelian.tan@swedish.org

Gale Lynn Tang, MD (Active)
University of Washington
Surgica Services 112, VA PSHCS
1660 S. Columbian Way
Seattle, WA 98115
Tel: (206) 764-2245
Fax: (206) 764-2529
Email: gtang@u.washington.edu

Roy A. Taylor, MD (Active)
4540 Cordata Pkwy, Suite 201
Bellingham, WA 98226
Tel: 360-676-1225
Fax: 360-734-5947
Email: rataylor@hinet.org

David C. Taylor, MD (Active)
University of British Columbia
2775 Laurel Street
Suite 4213
Vancouver, BC V5Z 1M9
CANADA
Tel: 604-875-5540
Fax: 604-875-5542
Email: dctaylor@interchange.ubc.ca

Lloyd Taylor, MD (Senior)
Oregon Health & Science University
3181 SW Sam Jackson Park Road
OP-11
Portland, OR 97201
Tel: 503-494-7593
Fax: 503-494-4324
Email: taylorl@ohsu.edu

Des Teso, MD (Active)
Southwest Washington Medical Center
14615 NE 11th Street
Vancouver, WA 98684
Tel: 360-514-1854
Fax: 360-514-6063
Email: dteso@swmedicalcenter.org
David F.J. Tollefson, MD, FACS (Active)
3920 Capitol Mall Drive SW
Suite 302
Olympia, WA 98502
Tel: 360-754-3507
Email: tolledav@hotmail.com

Nam T. Tran, MD (Active)
University of Washington
325 9th Avenue, Box 359980
Seattle, WA 98104
Tel: 206-744-4829
Fax: 206-744-6794
Email: nam@uw.edu

Michael J. Tullis, MD, FACS (Active)
St. Luke’s - Cardiothoracic and Vascular Associates
333 N. First Street, Suite 280
Boise, ID 83702
Tel: 208-345-6545
Fax: 208-345-1213
Email: mjtullis@slhs.org

Robert G. Turnbull, MD (Active)
Professional Corporation
205 Tawa Centre
3017 - 66 Street
Edmonton, AB T6K 4B2
CANADA
Tel: 780-461-6012
Fax: 780-461-5442
Email: rgturnbull@surgicorp.ca

R. Mark Vetto, MD, FACS (Senior)
3330 SW Fairmount Boulevard
Portland, OR 97239
Tel: 503-233-3337
Fax: 503-291-4059
Email: rmarkvetto@aol.com

Felix G. Vladimir, MD (Active)
Multicare Vascular Surgery
2711 Henry RD
Suite 204-B
Tacoma, WA 98403
Tel: 253-403-8410
Fax: 253-848-9861
Email: felixvladimir@gmail.com

Gabriel Wallace, MD (Associate)
University of Washington
Email: wallaceg@u.washington.edu

James C. Watson, MD, FACS (Active)
The Polyclinic
550 17th Avenue
Suite 400
Seattle, WA 98122
Tel: 206-320-3100
Email: james.watson@polyclinic.com
John W. Wiest, MD, FACS (Active)
Pacific Vascular Specialists
9155 SW Barnes Road
Suite 321
Portland, OR 97225
Tel: 503-292-0070
Fax: 503-292-7731
Email: john.wiest@providence.org

W. Kent Williamson, MD (Active)
Pacific Vascular Specialists
9155 SW Barnes Road
Suite #321
Portland, OR 97225
Tel: 503-292-0070
Fax: 503-292-7731
Email: weldon.williamson@providence.org

Gerrit B. Winkelaar, MD, MSc (Active)
University of Alberta
3017 66 Street
Suite 205
Edmonton, AB T6K 4B2
CANADA
Tel: 780-461-6012
Fax: 780-461-5442
Email: gbwinkelaar@shaw.ca

Roman Wong, MD, FACS (Active)
801 Broadway
Suite 522
Seattle, WA 98122
Tel: 206-682-6087
Fax: 206-343-9170

Allen H.B. Yu, MD, FACS (Active)
Vascular Surgery NW, P.S.
11311 Bridgeport Way SW
Suite 203
Lakewood, WA 98499
Tel: 253-572-2844
Fax: 253-572-2841

Michael Zammit, MD, FACS (Active)
Surgical Assoc. of Edmonds
7315 212th Street S.W.
Suite 201
Edmonds, WA 98177
Tel: 425-778-8116
Fax: 425-775-9526

R. Eugene Zierler, MD (Active)
University of Washington
1959 NE Pacific Street
Box 356410
Seattle, WA 98195
Tel: 206-598-9851
Fax: 206-598-1466
Email: gzierler@u.washington.edu
2015 ANNUAL MEETING

October 1–2, 2015
Seattle, WA  Renaissance Seattle Hotel