Vascular Quality Initiative®

Report of the Chair, SVS PSO Board of Governors

Richard P. Cambria, MD

As we begin our fourth year of operation, the Vascular Quality Initiative is now a mature resource for vascular specialists and a model for other societies. As described in this annual report, the VQI met a number of significant milestones in 2013:

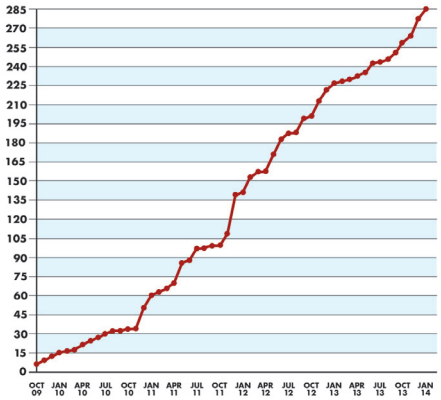
- Participation continues to grow. At year end, 278 centers and 2354 physicians were participating. More than 124,000 procedures have been entered into VQI at a rate of 5,500 procedures per month.
- Two new modules were added this year, for amputation and IVC filter. Software upgrades provide for real-time risk adjusted center comparison reports, user-customized regional and national benchmarking for any variable, and dynamic content that allows centers to participate in customized data collection projects.
- Perhaps most significant is the important milestone that VQI is now poised to conduct post approval studies. Most gratifying among these is the imminent launch of the post approval study for TEVAR in the management of type B aortic dissection. While this has been precipitated by the recent FDA approval of a TEVAR device, the SVS Outcomes Committee has worked for several years to formulate the study tool for this project which will now be conducted through the VQI. Our medical director, Jack Cronenwett, deserves special recognition for negotiating the role of VQI for this important study. I will chair the steering committee supervising this project over the next 5 years.

I would like to acknowledge the work of the many volunteers who have help build the VQI into what it is today.

- Thousands of physicians have committed the time and effort required to make the VQI the robust registry that it is.
- Dozens of vascular surgeons are building regional quality groups, a unique element of the VQI not found in other registries.
- Larry Kraiss has chaired the Arterial Quality Committee since its creation in 2011. Under his leadership new modules have been created and the current modules are being updated.
- In 2013, a Venous Quality Committee was created. Jose Almeida now chairs this committee, which created the IVC filter data form and is working on the new varicose vein module.
- Joe Schneider chairs the participation growth work group which is working closely with the PSO staff, regional group leaders and M2S sales force to recruit new members.
- Fred Weaver chairs the industry/external relations work group that is actively seeking corporate support for the VQI.
- Mike Dalsing chairs the economics work group which is working to include cost data in reports for hospital administration and is creating strategies for dealing with third party payers.

As my term as chair of the Governing Council comes to an end in June, I continue to be inspired by the commitment and enthusiasm of everyone involved in the VQI. Working together, all have helped to bring a magnificent concept into reality.

Growth of Participating Centers



Quality Initiative for Endovascular Treatment of Descending Aortic Dissection

Jack L. Cronenwett MD, *Medical Director*

During the past 6 months, new TEVAR devices made by W. L. Gore and Medtronic for treating descending aortic dissection have been approved by the FDA. Approval was granted after safety and effectiveness was demonstrated in pre-market studies of treatment of acute, complicated dissection. In addition, approval was broadened to include treatment of chronic and non-complicated dissection, with the proviso that the efficacy of TEVAR treatment of descending aortic dissection would be more fully analyzed through post-market study of these, and future dissection-specific TEVAR devices.

For the past year, representatives of the SVS PSO, FDA, device manufacturers, and scientific advisors from surgical societies have met to discuss the value of using registry data to measure the safety and efficacy of TEVAR treatment of aortic dissection. Based on these discussions, the SVS PSO is pleased to announce a voluntary quality improvement initiative that will collect additional data and follow-up time points for patients in VQI who are treated for acute or chronic descending thoracic aortic dissection. These data will be analyzed and used for quality improvement purposes within the SVS PSO, and non-identifiable data from this project will be shared with the FDA and device manufacturers, to meet the needs of their post approval study requirement. All VQI members will receive an invitation to participate in this project. A Steering Committee, chaired by Richard Cambria, M.D., has been appointed to oversee the project, which is expected to recruit 200 acute and 200 chronic dissection procedures, with subsequent 5 year follow-up. Sites will be selected to participate in this QI project based on their volume of TEVAR procedures and interest in collecting additional information and follow-up. All VQI sites will be invited to contribute the standard data that they normally enter for TEVAR treatment of dissection. Participating sites will be reimbursed for the expense of entering additional data for this project, up to $3,000 for initial treatment and 5-year follow-up. Such fees will be useful for sites to offset the cost of participating in VQI.

The SVS PSO is pleased to collaborate with the FDA and industry to help evaluate the safety and efficacy of new devices in the real world practice represented by VQI. It is anticipated that this will be the first of many opportunities to combine QI projects in VQI with regulatory and other needs for clinical data that address joint goals for the improvement of vascular health care.

Arterial Quality Committee

Larry W. Kraiss MD, *Chair*

The AQC is composed of representatives from each regional quality group and organized into workgroups for each of the arterial modules. These workgroups evaluate the data from each module and make recommendations for modification in reporting or additional analyses. During the past year, most effort was focused on a major revision of the TEVAR module, coordinated by Adam Beck MD, to support the quality initiative related to new devices that have been approved to treat descending aortic dissection.

The AQC affirmed the VQI commitment to at least 80% one year follow-up completion, but noted that this was achieved for only 61% of 2011 cases. Long term follow-up data is critically important to understanding and improving outcomes, so SVS PSO staff are working with centers that need help to achieve at least 80% long term follow-up.

The AQC oversees the activity of the Research Advisory Committee (Philip Goodney MD - Chair) which reviews and approves investigator-initiated requests for de-identified national level data to facilitate quality improvement and comparative effectiveness research. This year, 18 applications from 10 VQI centers were approved **(www.svsvqi.org)**. Participation from each regional group is invited for all approved projects.

Other AQC activities this year included an update on the first national quality initiative to reduce surgical site infection, development of a COPI report for length of stay following elective CEA and EVAR, analysis to determine the value of arrival and maximum heart rate during surgery, recommendations for antiplatelet agents and statins, and analysis of the effect of beta blockers on postoperative complications, which will be presented at VAM.

The AQC values and solicits participation from interested VQI members. There are more projects than there are people to do them. If you are interested in participating in these projects, please contact your regional group medical director or SVS PSO staff.

Venous Quality Committee

Jose Almeida MD, *Chair*

The Inferior Vena Cava Filter module was launched in February, 2013. During 2013, 10 centers contributed 365 procedures to the registry, which is 50% more than were contributed in one year to the American Venous Forum Registry. More than 25 centers are now participating, so much more data will be available this year. Preliminary analysis found that 6% of filters were placed for prophylactic indications to prevent PE after trauma (33%) or before a planned major operation (67%). In contrast, 44% of the filters were placed for therapeutic indications: 31% for failed anticoagulation and 69% for contra-indications to anticoagulation. Nearly all filters were intended to be temporary (82%). Future follow-up data will allow calculation of retrieval rate.

Currently a new Varicose Vein data form is under development, with plans for release by the end of 2014. This module will be targeted to Office-based Vein Centers, with focused data collection that can be done by web-based data entry or downloaded from electronic record systems. M2S will collaborate with EMR vendors to provide a mechanism for vendors to incorporate correct variables into their system, and to download these for VQI members, to avoid dual data entry.

VQC leadership has had initial conversations with the Intersocietal Accreditation Committee for Vein Centers (IAC-VC) regarding likely future requirements for participation in a quality improvement registry. The VQC will review the IAC-VC standards for accreditation and build them into the Varicose Vein module to support IAC-VC accreditation for VQI members when such a requirement is enacted. It should be noted that participation in VQI satisfies Maintenance of Certification (MOC) requirements for the American Board of Surgery and can be used through M2S for the Physician Quality Reporting System (PQRS).

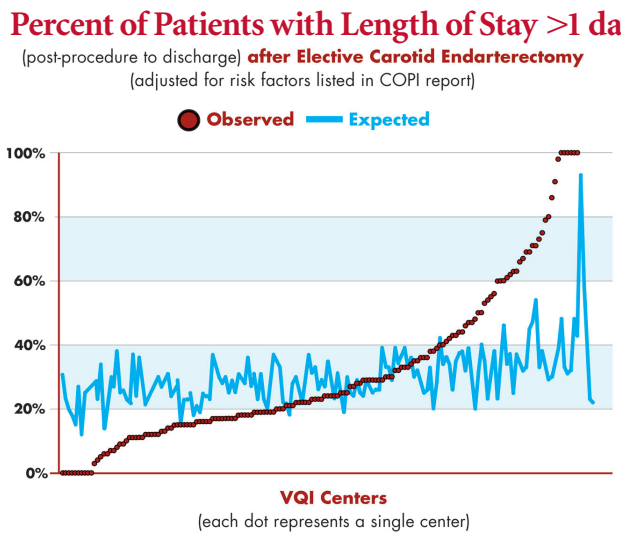
Variation in Length of Stay After Carotid Endarterectomy Across VQI Centers

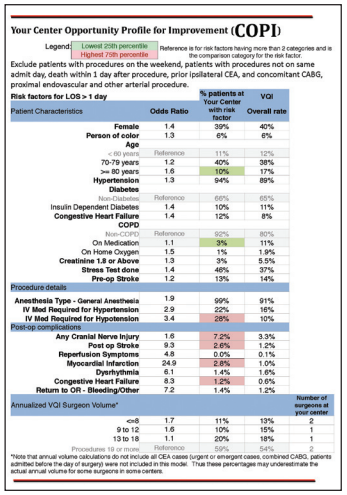
Karen Homa PhD, *Quality Director*

Reducing health care cost is an important mission of VQI, in conjunction with improving outcomes. This year the SVS PSO examined the variation in length of stay (LOS) after carotid endarterectomy (CEA), the most common open vascular operation. For patients admitted the same day as their CEA (and without concomitant procedures or prior CEA), we found that 71% were discharged the following day, thus 29% have LOS > 1 day, and this varies substantially by center. In some centers, all patients leave the day after the procedure, while in other centers, all patients stayed at least 2 days post-operatively.

A multivariable logistic regression model was developed to identify factors including patient characteristics, procedure details, post-op complications, and surgeon volume that were independently associated with LOS > 1 day. This model was then used to calculate the center's predicted rate of LOS > 1 day and to identify procedure details, post-op complication or surgeon volume issues, which represented opportunities for improvement. This information was used to create a Center Opportunity Profile for Improvement (COPI) report for each center. These reports anonymously compared the center's results with the VQI average, as well as for each factor that influences LOS. In the example below, the fictitious hospital was shown to be in the highest 75th percentile for postoperative cranial nerve injury, stroke, MI, CHF and need for vasoactive drugs, which resulted in significantly longer LOS and are targets for improvement.

Early identification of patients at high risk for prolonged LOS may allow centers to mobilize discharge planning resources sooner. Comparison with other centers and networking within VQI may allow centers to develop more systematic methods to facilitate early, but safe discharge. This detailed insight is not available through other metrics. By providing specific COPI reports for centers to identify potentially modifiable risk factors, the SVS PSO helps members reduce cost and improve quality.




Your Center Opportunity Profile for Improvement (COPI)

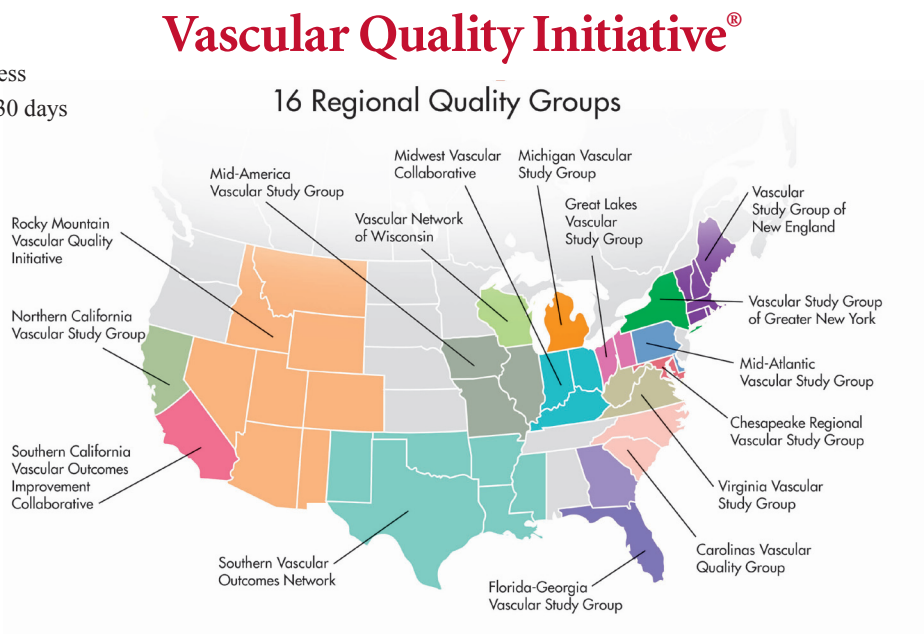
Download a sample Center Opportunity for Performance Improvement report at ***www.vsweb.org/COPI.***

Regional Group Quality Activity

Carrie Bosela RN, *Administrative Director*

There are now 16 regional quality groups with several more in development. Each group meets semi-annually, analyzes regional data, and develops QI projects. PSO staff provides support to these groups around organizational structure, bylaws development, recruiting members and interaction with the SVS PSO. In addition, PSO staff provide regional data for discussions at these meetings. Examples of regional quality initiatives currently underway are listed below:

- Increased smoking cessation after surgery by referral to QUIT lines
- Increased ultrasound guidance for femoral artery access
- Measuring surgical site infection and readmission at 30 days
- Shortening length of stay after CEA and EVAR
- Selecting the best therapy for leg occlusive disease
- Automated telephone instruction and monitoring to reduce readmission
- Increased usage of anti-platelet agents and statins preoperatively
- Chlorhexidine shower the night before surgery to reduce SSI
- Selecting eversion vs. conventional CEA technique
- Improve patient selection for types of dialysis access
- Reducing hematoma after PVI with a risk prediction tool
- Optimizing the use of stress testing in vascular patients

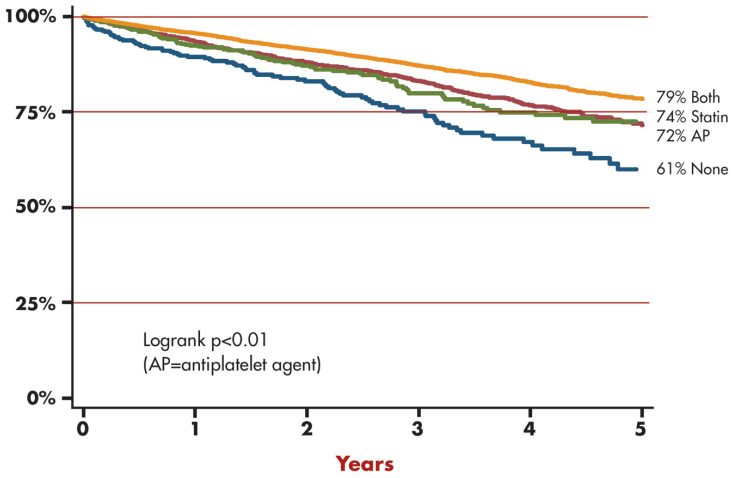


Arterial Quality Committee Recommends Perioperative Antiplatelet and Statin Therapy

Robert Stepaccher, MD

A recent publication by De Martino et al (J Vasc Surg, 2014) found that perioperative treatment with antiplatelet agents and statins improved 30 day mortality (odds ratio 0.76) and that patients discharged on both these medications had improved 5 year survival, from 61% to 79% (hazard ratio 0.5, Figure). This was based on the analysis of nearly 15,000 patients undergoing elective open or endovascular aneurysm repair, carotid endarterectomy or stenting, and bypass or catheter-based intervention for lower extremity occlusive disease in the Vascular Study Group of New England.

Five Year Survival By Discharge Medication



Based on these findings, and general guidelines for secondary prevention of atherosclerosis, the SVS VQI Arterial Quality Committee recommends that patients undergoing arterial surgery or interventional treatment be given an antiplatelet agent and statin preoperatively and at discharge, unless they cannot tolerate these medications. Incented by quality guidelines, patients with acute myocardial infarction are discharged on aspirin and a statin nearly 99% of the time. In contrast, only 73% of patients undergoing arterial treatment in VQI are currently discharged on an antiplatelet agent and statin, with a range across centers of 15% to 100%.

Based on the demonstrated benefit of these drugs to prolong survival in vascular patients, the AQC has adopte d a minimum goal of 95% antiplatelet/ statin prescription at discharge for VQI members.

To help VQI members achieve 95% utilization, the SVS PSO will provide new reports to monitor compliance with this recommendation. A challenge expressed by some providers is the added responsibility to monitor and manage side effects of statins. To address these concerns, the SVS PSO will develop a toolkit containing best practices and educational materials to help both physicians and patients accomplish this task.

In establishing these evidence-based guidelines, the AQC emphasizes that, for many of our patients, simply prescribing optimal medications after a vascular procedure can dramatically improve patient survival. Further data will be presented at the SVS VAM to substantiate this benefit across VQI.

Participating VQI Facilities

Abington Memorial Hospital
Adventist Medical Center
Alamance Regional Medical Center
Albany Vascular Specialist Center
Alegent Health Bergan Mercy Medical Centerr
Forbes Regional Hospital
Allegheny General Hospital
Allegheny Valley Hospital
West Penn Hospital
United Hospital (Allina)
Abbott Northwestern Hospital (Allina)
Mercy Hospital (Allina)
Unity Hospital (Allina)
Overlook Medical Center
Augusta Health
Augusta Vascular Center
Aultman Hospital
Aurora Medical Center, Kenosha
Aurora BayCare Medical Center, Green Bay
Aurora St. Luke's South Shore, Cudahy
Aurora West Allis Medical Center
Aurora Memorial Hospital, Burlington
Aurora Sheboygan Memorial Medical Center
Aurora St. Luke's Medical Center, Milwaukee
Aurora Medical Center, Grafton
Aurora Medical Center, Summit
Aurora Medical Center, Hartford
Aurora Medical Center, Manitowoc County
Aurora Medical Center, Oshkosh
Aurora Sinai Medical Center, Milwaukee
Baptist Hospital of Miami
Baptist Memorial Hospital
Bassett Medical Center
THE HEART HOSPITAL Baylor Plano
Baylor Jack and Jane Hamilton Heart and Vascular Hospital
Baystate Medical Center
Beaufort Memorial Hospital
Beaumont Grosse Point
Beaumont Troy
Beaumont Royal Oak
Beebe Healthcare
Berkshire Medical Center
Beth Israel Deaconess Medical Center
Boston Medical Center
Brigham and Women's Hospital
Cardiothoracic and Vascular Surgeons
Cardiothoracic Surgical Associates, PA
Carilion Roanoke Memorial Hospital
St. Mary's Hospital - AZ
Carondelet Heart & Vascular Institute
Northwest Medical Center
Carroll Hospital Center
Carson Tahoe Regional Hospital
Catholic Health Sister of Charity Hospital
Catholic Health Sister of Charity, St. Joseph Campus
Catholic Health Mercy Hospital of Buffalo
Catholic Health Kenmore Mercy Hospital
Catholic Medical Center
Cedars-Sinai Medical Center
Central DuPage Hospital
Central Maine Medical Center
Penrose St. Francis
Porter Adventist Hospital
Charleston Area Medical Center
Charlton Memorial Hospital
Christiana Care Health System
CHRISTUS St. John Hospital
Johnston-Willis Hospital
Chippenham Hospital
Cleveland Clinic
Coastal Vascular & Interventional, PLLC
Community Heart and Vascular Hospital
Community Hospital South
Community Hospital East
Concord Hospital
Cone Health
Danbury Hospital
Dartmouth Hitchcock Medical Center
Eastern Maine Medical Center
Elliot Health System
Saint Joseph Hospital
Southdale Hospital
University of Minnesota Medical Center Fairview
Fletcher Allen HealthCare
Florida Hospital
Floyd Medical Center
Froedtert Health
Geisinger Community Medical Center
Geisinger Medical Center
Geisinger Wyoming Valley Medical Center
Greenville Hospital System
Guthrie Clinic
Hamilton Medical Center
Hartford Hospital
Henry Ford Hospital
Hill Country Memorial Hospital
Hospital of Saint Raphael
Inova Loudoun Hospital
Inova Mount Vernon Hospital
Inova Alexandria Hospital
Inova Fair Oaks Hospital
Inova Fairfax Hospital
Inova Gainesville Vein and Vascular Institute
Iowa Heart Center at Mercy Medical Center
Iowa Methodist Medical Center
IU Health - Goshen Hospital
IU Health - Bloomington Hospital
IU Health - Methodist
IU Health - Arnett Hospital
IU Health - Ball Memorial Hospital
IU Health - Saxony Hospital
ProMedica Toledo Hospital
John F Lucas III, MD
Johns Hopkins Bayview Medical Center
Johns Hopkins Hospital
Kaleida Health
Kennedy University Hospital
Jewish Hospital
King's Daughters Medical Center
Lake Martin Vascular
Lakes Region General Hospital
Rhode Island Hospital
The Miriam Hospital
Loma Linda University Medical Center
Los Angeles County Harbor – UCLA Medical Center
Heart Hospital of New Mexico at Lovelace Medical Center
LSU Health Science Center – Shreveport
Maimonides Medical Center
Maine Medical Center
MaineGeneral Medical Center
Marin General Hospital
Stafford Hospital
Mary Washington Hospital
Northwest Hospital, Maryland Vascular
Greater Baltimore Medical Center, Maryland Vascular
Sinai Hospital of Baltimore, Mayland Vascular
Saint Joseph Medical Center, Maryland Vascular
Massachusetts General Hospital
Mayo Clinic
McLaren Flint
McLeod Regional Medical Center
Medical University of South Carolina Hospital
Washington Hospital Center
Memorial Regional Hospital
Memorial Hermann Heart & Vascular Institute
Memorial Hermann Southwest Hospital
Memorial Hospital of South Bend
Mercy Hospital
Mercy Medical Center – Ohio
Mercy Medical Center
Riverview Medical Center
Bayshore Community Hospital
Southern Ocean Medical Center
Jersey Shore University Medical Center
Ocean Medical Center
Michigan Vascular Center
Mission Hospital
Montefiore Medical Center
Morton Plant Mease Hospital
Morton Plant North Bay Hospital
Mease Countryside Hospital
Munroe Regional Medical Center
Nebraska Heart Hospital
North Shore University Hospital
Long Island Jewish Medical Center
Lenox Hill Hospital
NorthShore Hospital
Northside Hospital Atlanta
Northside Hospital Cherokee
Northside Hospital Forsyth
Northwest Hospital and Medical Center
Northwestern Memorial Hospital
Novant Health Forsyth Medical Center
Novant Health Presbyterian Medical Center
NYU Langone Medical Center
Ochsner Medical Center
Wexner Medical Center
OSF St. Joseph Medical Center
OSF St. Mary Medical Center
OSF Saint Anthony Medical Center
OSF Saint Francis Medical Center
Palm Beach Gardens Medical Center
Palmetto Health Richland
Palo Alto Medical Foundation
Penn State Milton S. Hershey Medical Center
Peripheral Vascular Associates
Piedmont Hospital
Premier Surgical Associates, PLLC
Presbyterian Healthcare Services
Providence Tarzana Medical Center
Providence St. Joseph Medical Center
Redmond Regional Medical Center
Rockford Memorial Hospital
Roper St. Francis
Sacred Heart Medical Center
Saint Alphonsus Regional Medical Center
Saint Anne's Hospital
Saint Francis Hospital
Saint Luke's Episcopal Presbyterian Hospital
San Fernando Valley Vascular Group
Sanford Vascular Associates
Sanger Heart & Vascular Institute
Scott & White Memorial Hospital
Self Regional Health
Sentara Princess Anne Hospital
Sentara Leigh Hospital
Sentara Williamsburg Regional Medical Center
Sentara Virginia Beach General Hospital
Sentara Obici Hospital
Sentara Norfolk General Hospital
Sentara Careplex Hospital
Sentara RMH Medical Center
Sharp Grossmont Hospital
Sharp Memorial Hospital
Southern Illinois University School of Medicine
Spartanburg Regional
Spectrum Health Hospital
SSM St. Joseph Health Center
St. Agnes
St. Anthony's Hospital
St. Elizabeth's Medical Center
St. Francis Heart Center
St. Luke's Hospital
St. Luke's Hospital & Health Network (PA)
St. Luke's Regional Medical Center
St. Luke's-Roosevelt Hospital Center
St. Mary's Hospital - Decatur
St. Mary's Medical Center (WV)
St. Vincent Healthcare (Montana)
St. Vincent Hospital and Healthcare Center
St. Vincent Heart Center of Indiana, LLC
Stanford Hospital & Clinics
Stony Brook University Medical Center
University Hospital
Tampa General Hospital
Texas Health Presbyterian Hospital
The Emory Clinic
The Methodist Hospital System, Houston
The Practice of Stephen M. Ryan, MD
The Reading Hospital and Medical Center
Regional Medical Center, Orangeburg
The Vein and Vascular Institute of Tampa Bay
Thomas Jefferson University Hospital
Toronto General Hospital
Trident Medical Center
Tufts Medical Center
U Mass Memorial
UC Davis Health System
UCLA Ronald Reagan Medical Center
UCSD Medical Center
UnityPoint Health - Methodist
University of Arizona Medical Center
University of Chicago Medical Center
University of Colorado, Denver
University of Florida, Gainesville
University of Maryland Medical Center
University of Michigan
University of Mississippi Medical Center
University of Missouri Medical Center
University of North Carolina Hospitals
University of Pennsylvania
UPP Vascular Surgery
University of Rochester Medical Center
USC University Hospital
University of Tennessee Medical Center
U of Texas Health Science Center, San Antonio
John Sealy Hospital, UTMB
University of Utah Hospital and Clinics
University of Virginia Health System
Vascular Center of Northern Michigan
Vidant Medical Center
Weill Cornell Medical College
Weiss Memorial Hospital
Jackson Madison County General Hospital
William D. Suval, M.D., Inc.
Winchester Medical Center
Winthrop University Hospital
Yale-New Haven Hospital