2016 ANNUAL REPORT

Vascular Quality Initiative®

Year in Review
Since last June, VQI added 47 new centers and now comprises 377 centers, over 2,900 physicians, and nearly 300,000 procedures in its 12 quality improvement registries. In addition to its continued growth, VQI expanded its activities in many areas, including:

- **VQI ANNUAL MEETING.** Starting this year, VQI will hold an Annual Meeting in conjunction with SVS VAM, which will feature guidance from QI experts, a QI toolkit, and successful projects from individual centers. The 17 VQI Regional Quality Groups continued to hold biannual meetings where members analyze variation across centers to identify best practices and opportunities for QI projects.

- **VQI PARTICIPATION AWARD.** A new program was instituted this year to recognize VQI member centers for excellence in one-year follow up reporting, Regional Quality Group meeting participation and multiple registry enrollment. Of eligible centers, 58% received 1, 2 or 3 “Stars” based on their level of participation, as listed on the VQI website.

- **QUALITY IMPROVEMENT REPORTS.** The SVS PSO distributed 4 Center-level and 4 Physician-level reports this year, which identified specific opportunities for improvement related to reducing length of stay, infection, stroke and hematoma rate, and improving smoking cessation, medical management and appropriate patient selection.

- **NATIONAL RESEARCH PROJECTS.** This year the SVS PSO Research Advisory Committee (RAC) approved 64 national research projects submitted by 51 unique VQI investigators in 26 centers, representing diverse topics across multiple procedures. In addition, multiple research projects using regional data were performed at VQI sites.

- **VASCULAR MEDICINE REGISTRY.** In collaboration with the Society for Vascular Medicine, VQI has developed a new registry to evaluate the treatment and outcomes of patients with carotid, AAA and lower extremity arterial disease who are managed medically. This will allow comparison with interventional and surgical treatment registries, and will launch later this year.

- **HOSPITAL COST DATA.** A pilot project in collaboration with MedAssets was conducted with 18 VQI hospitals that contributed their charge data for 700 EVAR procedures done in 2014. Charges were converted to costs and matched with VQI data to create homogeneous patient and procedure groups to allow accurate comparison of costs between hospitals. This will assess the usefulness of combining detailed clinical data with hospital billing data to identify opportunities for cost saving in various expense categories.

- **ELECTRONIC MEDICAL RECORDS INTEGRATION.** VQI encourages EMR companies to integrate VQI data elements into their products to allow one-time data entry during the process of care and eliminate the need for web-based registry data entry. In addition to its standard data import tools, M2S developed partial data integration capability with EPIC®, Medstreaming®, mTuitive®, StreamlineMD® and SonoSoft® this year. This allows hospitals to comply with current Meaningful Use requirements and the planned Advancing Care Information component of the CMS Merit-based Incentive Payment System (MIPS).

- **STRATEGIC PLANNING.** SVS PSO leaders developed key goals for this year that include stimulating QI projects, maximizing value for members, strengthening collaboration with external stakeholders, enhancing registry effectiveness, increasing VQI membership, fostering industry relations and increasing operational efficiencies. To oversee these expanding operations, James Wadzinski was recruited into a new position of General Manager. As former Director of Operations at both ACS NSQIP and the American Hospital Association, Jim brings more than 20 years of association management experience to fill this important role.

Current Quality Initiatives
Quality improvement projects are initiated by Regional Quality Groups or promoted across all regions. Examples include:

- **OPTIMIZING DISCHARGE MEDICATIONS.** Research using VQI data showed that patients discharged on aspirin and statins after arterial procedures had significantly improved 5-year survival. VQI adopted this as a national QI project, and provides physicians and centers with regular feedback as well as tools such as guidelines for patient communication to primary care physicians, to increase the number of patients on these medications.

- **REDUCING LENGTH OF STAY.** VQI regional benchmark reports showed wide variation in LOS for major vascular procedures. Hospitals in several regional groups identified potential causes and brainstormed solutions including discharging patients directly from the ICU, adjusting the time of surgery, encouraging earlier patient mobility and providing patients with more information about discharge expectations during pre-surgical visits.

- **IMPROVING SMOKING CESSION.** VQI data show substantial variation across centers in the rate of patient smoking cessation one year after arterial procedures. A project by 8 VQI centers found that effective nicotine replacement and quit-line referral increased significantly at sites instructed in proper technique. A national QI effort with feedback is being launched in this important area.

- **IMPROVING APPROPRIATENESS OF CARE.** To benefit from prophylactic procedures, such as treatment of asymptomatic carotid stenosis, patients must have good life expectancy. VQI data have shown that one-year patient survival after CEA for asymptomatic stenosis varies significantly by surgeon, suggesting an opportunity for better patient selection. This year VQI distributed mortality-prediction models available on a smartphone and benchmark reports so that surgeons could evaluate their patient selection. A similar report for VQI centers compared the percentage of patients treated by peripheral intervention who had claudication versus critical limb ischemia, where substantial variation occurs, to provide insight into appropriateness of patient selection.

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SVS PSO Organization

The SVS Patient Safety Organization (PSO) depends on 285 physician members who volunteer to support VQI projects. These physicians practice in both hospitals and outpatient facilities and are drawn from the Society for Vascular Surgery (SVS), the American Venous Forum (AVF), the Society for Vascular Medicine (SVM) and 12 other endorsing societies.

SVS PSO COMMITTEES (AND CHAIRS):
- Governing Council (Larry Kraiss, MD)
- Technology Council (Fred Weaver, MD)
- Arterial Quality Council (Adam Beck, MD)
- Venous Quality Council (José Almeida, MD)
- Research Advisory Committee (Philip Goodney, MD)
- Communication Committee (Glenn Jacobowitz, MD)

REGISTRY COMMITTEES (AND CHAIRS):
- Open AAA Repair (Rumi Faizer, MD)
- Endovascular AAA Repair (Sal Scali, MD)
- Thoracic and Complex EVAR (Virenda Patel, MD)
- Lower Extremity Amputation (Ahmed Abou-Zamzam, MD)
- Carotid Artery Stenting (Grace Wang, MD)
- Carotid Endarterectomy (Randall DeMartino, MD)
- Peripheral Vascular Intervention (Daniel Bertges, MD)
- Hemodialysis Access (Karen Woo, MD)
- Infra-inguinal Bypass (Andres Schanzer, MD)
- Supra-inguinal Bypass (Andres Schanzer, MD)
- IVC Access (Tony Gasparis, MD)
- Varicose Vein (Thomas Wakefield, MD)

REGIONAL QUALITY GROUPS (AND LEADERS):
- Carolinas Region (Jeb Hallett, MD)
- Great Lakes Region (Jean Starr, MD)
- Greater New York Region (Apostolos Tassiopoulos, MD)
- Michigan Region (Alex Shepard, MD)
- Mid-America Region (Joseph Schneider, MD)
- Mid-Atlantic Region (Grace Wang, MD)
- Mid-South Region (Ed Garrett, MD)
- Midwest Region (Gary Lemmon, MD)
- New England Region (Phil Goodney, MD)
- Northern California Region (Tej Singh, MD)
- Pacific Northwest Region (Ben Starnes, MD)
- Rocky Mountain Region (Jeffrey Gilbertson, MD)
- Southeastern Region (Adam Beck, MD)
- Southern California Region (Ahmed Abou-Zamzam, MD)
- Southern Region (Dennis Gabel, MD)
- Upper Midwest Region (Steven Kappes, MD)
- Virginias Region (Gilbert Upchurch, MD)

Technology Improvements Through M2S

As the VQI technology partner, M2S has substantially improved the data collection and reporting system since VQI launched in 2011. This spring, M2S was acquired by Medstreaming, a leading provider of healthcare IT solutions for image intensive specialties. This partnership will offer efficiencies in workflow solutions, EMR integration, data analytics and image management. M2S will continue to work as a distinct entity within Medstreaming, and continue to work with the SVS PSO to prioritize new development projects, which this year included:

- Physician-level user-customizable reports in the Analytic Engine to benchmark with other physicians
- Addition of 15 quality measures to allow physicians to more easily meet PQRS requirements
- Increased standard reports for multiple registries in the Analytic Engine that can be customized by users
- Ability to define specific patient subgroups and “drill down” to the patient record at each center
- Health-system reporting to provide an overview of multiple hospitals combined in the same system

VQI Member Characteristics

<table>
<thead>
<tr>
<th>TYPES OF PARTICIPATING FACILITIES</th>
<th>37% Community</th>
<th>33% Academic</th>
<th>30% Teaching</th>
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<tbody>
<tr>
<td>SPECIALTY OF PARTICIPATING PHYSICIANS</td>
<td>41% Vascular Surgery</td>
<td>16% Cardiology</td>
<td>14% Radiology</td>
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VQI Activity With External Stakeholders

MEDICAL DEVICE MANUFACTURER PROJECTS

- **POST-APPROVAL SURVEILLANCE.** The TEVAR Aortic Dissection Device project, which began in October 2014 with Gore and Medtronic, has enrolled its 400 patient cohort much sooner than expected due to the established network of VQI sites. These patients will be followed annually for 5 years to understand device performance in real world practice and meet FDA regulatory requirements. The Lombard Angulated Neck EVAR project, which began in December 2014, now involves 17 sites and includes supplemental core lab imaging through M2S, in order to evaluate details such as endoleak during 5-year follow-up.

- **EXPANSION OF DEVICE INDICATIONS.** Many devices used to treat vascular disease have been adapted to new or expanded indications from those initially approved by the FDA. Data about such “off-label” use are captured in VQI and offer the potential to provide FDA, industry and physicians with important information to better match patients with devices for optimal treatment, and for potential expansion of approved indications for use. VQI, FDA and industry are now engaged in such projects, which can combine both historical and prospective VQI data.

- **OBJECTIVE PERFORMANCE DATA.** New device development and regulatory approval often require comparison with contemporary outcomes of existing techniques and devices. Such data have been collected in the “real world” of VQI across multiple physician specialties and hospital types. However, historical data may not always contain some details of device type or treatment that might be needed for a device evaluation project. This year VQI demonstrated the ability to supplement already-collected procedure and one-year follow-up data with new data added by sites that had performed these procedures. This provided the objective performance data, including already existing one-year follow-up, within 5 months, as opposed to a new prospective project over several years.

The VQI received important financial support from industry to fund new initiatives, such as new registries and reporting functionality. Corporate support totaled $525,000 this year, provided by these Quality Champions and Partners:

**QUALITY CHAMPIONS**
- Abbott
- Bard Peripheral Vascular
- BTG
- Gore
- Medtronic

**QUALITY PARTNERS**
- Cook Medical

FDA—MEDICAL DEVICE EPIDEMIOLOGY NETWORK (MDEPINET) PROJECTS

- **REGISTRY ASSESSMENT OF PERIPHERAL INTERVENTIONAL DEVICES (RAPID).** VQI actively participated in this project to develop a core minimum data set for assessment of devices used to treat peripheral arterial disease. This is a collaboration with multiple specialties, companies and agencies to develop a mechanism for common data extraction from multiple sources for total product life cycle device evaluation.

- **INTERNATIONAL CONSORTIUM OF VASCULAR REGISTRIES (ICVR):** VQI and 11 other national vascular registries from Europe and Australasia combined data to analyze variation in treatment of carotid and aortic aneurysm disease across countries, with an emphasis on open vs. endovascular treatment. This group is planning prospective multi-national device monitoring trials and additional retrospective comparison of treatment outcomes across countries.

NIH SPONSORED PROJECT

- **CREST-2 REGISTRY.** Investigators must report their carotid artery stent procedures to be qualified for this trial and then report non-randomized procedures during the trial. This year more than 90 interventionalist used VQI to report more than 800 CAS procedures for the CREST-2 Registry project.