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1. EXECUTIVE SUMMARY—THE VALUE OF PARTICIPATION IN THE VASCULAR QUALITY INITIATIVE (VQI)

“If you can’t measure it, you can’t improve it.” This management catchphrase has been attributed to Edwards Deming, Peter Drucker Lord Kelvin and others, but it could serve as the founding principle of the Vascular Quality Initiative. Our mission is to gather data to help hospitals and providers assess their performance and provide better vascular care.

VQI’s 12 registries contain demographic, clinical, procedural and outcomes data from more than 500,000 vascular procedures performed nationwide and in Canada. Each record includes information from the patient’s initial hospitalization and at one-year follow-up. The wealth of data allows centers and providers to compare their performance to regional and national benchmarks. All centers and providers receive biannual dashboards and regular performance reports, so they can use their data to support quality improvement initiatives. Biannual regional meetings allow physicians of different specialties, nurses, data managers, quality officers, and others to meet, share information and ideas, and learn from each other in a positive and supportive environment. Members have used VQI data to significantly improve the delivery of vascular care at local and national levels, reducing complications and expenses.

Investigators have used VQI data for risk stratification, outcomes analysis, quality improvement, defining best clinical practices, comparative effectiveness research and reducing resource utilization. This work has resulted in more than 140 scientific publications in peer-reviewed journals since 2011. VQI membership also facilitates participation in clinical trials and other medical device evaluation efforts.

The VQI collaborates with multiple organizations, including the American College of Cardiology, Society of Interventional Radiology, governmental regulatory agencies, device manufacturers, and payers. The Registry Assessment of Peripheral Interventional Devices (RAPID) is a collaboration of VQI with these other groups. RAPID plans to use the strength of different societies (VQI, NCDR, and SIR) to enhance device evaluation and to develop objective performance criteria for the endovascular treatment of lower-extremity arterial occlusive disease. VQI also works with industry to provide clinically detailed data for device performance, post-market surveillance, and label expansion. VQI has partnered with vascular registries from Europe and Asia to form the International Consortium of Vascular Registries (ICVR) to bring a global perspective to improving vascular care and device evaluation.
Activities for 2017/2018

1. Center and procedure growth: As of September 2018, VQI had reached two new milestones, with more than 500 member centers and more than 500,000 vascular procedures in its registries.

2. Projects and journal articles: In the past year, VQI’s Research Advisory Council approved 99 data analysis projects using VQI data, and 63 articles were published in peer reviewed journals.

3. National quality improvement initiatives: The SVS PSO launched two major quality initiatives, working with regional quality groups and centers to develop strategies to 1) increase the prescription of appropriate discharge medications for secondary prevention and 2) increase the use of imaging for long-term follow-up of endovascular AAA patients.

4. Quality project program: There are 55 VQI centers working on specific quality improvement projects. Results will be presented as posters and abstracts at the VQI@VAM meeting to take place in June 2019.

5. Dashboards and Center Opportunity Profile for Improvement (COPI) reports: The center-level and physician-level dashboard reports are produced quarterly for each VQI registry to report outcomes and provide benchmarks. COPI reports use VQI data to highlight process of care for improvement.

6. VQI@VAM: The SVS PSO hosts this annual meeting in conjunction with the SVS Vascular Annual Meeting to present the latest quality activities, including in-depth case reviews, case study presentations, and outcomes analysis as well as presentations from quality experts. VQI@VAM19 will be held at National Harbour, MD.

7. Industry projects: Five post-approval surveillance projects are currently underway in VQI. In addition, the Transcarotid Surveillance Project (TSP) allows centers to participate in the study and receive reimbursement for eligible cases. VQI allows data collection for CREST-2 participation and works with industry and regulatory agencies in the Registry Assessment of Peripheral Interventional Devices (RAPID) and Superficial Popliteal Evidence Development (SPEED) projects.

8. Development: The SVS PSO is currently working on enhancements to VQI’s PVI and Hemodialysis registries, and two new registries are nearing completion – the Vascular Medicine Registry and the Venous Stent Registry.
THE VQI REGISTRIES

As of September 2017, there were 12 VQI registries that contained 413,905 vascular procedures. During the past year (October 2017 through September 2018), there were over 100,000 procedures added to the registries, for a total of 519,178.

**Total Procedures Captured** 519,178

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Procedures Captured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral Vascular Intervention</td>
<td>164,793</td>
</tr>
<tr>
<td>Carotid Endarterectomy</td>
<td>108,485</td>
</tr>
<tr>
<td>Infra-Inguinal Bypass</td>
<td>48,350</td>
</tr>
<tr>
<td>Endovascular AAA Repair</td>
<td>43,773</td>
</tr>
<tr>
<td>Hemodialysis Access</td>
<td>42,967</td>
</tr>
<tr>
<td>Carotid Artery Stent</td>
<td>24,077</td>
</tr>
<tr>
<td>Varicose Vein</td>
<td>23,526</td>
</tr>
<tr>
<td>Supra-Inguinal Bypass</td>
<td>16,197</td>
</tr>
<tr>
<td>Thoracic &amp; Complex EVAR</td>
<td>12,665</td>
</tr>
<tr>
<td>Lower Extremity Amputations</td>
<td>12,098</td>
</tr>
<tr>
<td>Open AAA Repair</td>
<td>11,377</td>
</tr>
<tr>
<td>IVC Filter</td>
<td>10,870</td>
</tr>
</tbody>
</table>
3. OUTCOMES & DATA QUALITY DASHBOARDS

The VQI dashboards allow physicians and centers to compare their performance to regional and national benchmarks. The SVS PSO registry committees selected outcome measures to be reported in the dashboards, which are distributed quarterly to VQI members. The dashboards provide each physician his or her individual results, along with results for the physician’s center, region and across all VQI. Results that are in the top 25th percentile are highlighted in green and those in the bottom 25th percentile are highlighted in red.

Table 3.1: Sample Physician Dashboard, PVI Registry

Your results are highlighted in green if you are at or above the top 25th percentile among all VQI physicians, and in red if at or below the bottom 25th percentile. Your center’s results are similarly color-coded if they fall above or below the 75th or 25th percentiles among all VQI centers.

Note that percentiles are based on the rates of individual physicians or centers, so it is possible for your rate or your center’s rate to be below the overall VQI rate across all procedures (the “VQI Overall” column) but still be above the 75th percentile across all physicians’ or centers’ individual rates.

Note also that percentages are computed only among cases with non-missing data for each outcome, so it is possible to have rates for some outcomes but “No cases” for others. Regional data are suppressed if your region has fewer than 3 centers participating in this registry.

<table>
<thead>
<tr>
<th>Category</th>
<th>Outcome/Complication</th>
<th>Your Results</th>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case Data</strong></td>
<td>Number of cases reviewed</td>
<td>3</td>
<td>46</td>
<td>2466</td>
<td>28817</td>
</tr>
<tr>
<td><strong>Hematoma</strong></td>
<td>Any Hematoma</td>
<td>0%</td>
<td>4.4%</td>
<td>4.2%</td>
<td>2.4%</td>
</tr>
<tr>
<td></td>
<td>Moderate/Major Hematoma</td>
<td>0%</td>
<td>0%</td>
<td>0.7%</td>
<td>0.7%</td>
</tr>
<tr>
<td><strong>Discharge Medications</strong></td>
<td>Antiplatelet</td>
<td>100%</td>
<td>95.3%</td>
<td>96.1%</td>
<td>94.1%</td>
</tr>
<tr>
<td>(excludes death in hospital)</td>
<td>Statin</td>
<td>100%</td>
<td>93%</td>
<td>86.1%</td>
<td>82.3%</td>
</tr>
<tr>
<td><strong>Smoking in Claudicants</strong></td>
<td>Never</td>
<td>0%</td>
<td>0%</td>
<td>9.5%</td>
<td>11.4%</td>
</tr>
<tr>
<td></td>
<td>Prior</td>
<td>0%</td>
<td>22.2%</td>
<td>56.7%</td>
<td>49.3%</td>
</tr>
<tr>
<td></td>
<td>Current</td>
<td>100%</td>
<td>77.8%</td>
<td>33.8%</td>
<td>39.3%</td>
</tr>
<tr>
<td><strong>9-Month Outcomes</strong></td>
<td>9-Month AFS* for CLI</td>
<td>No cases</td>
<td>100%</td>
<td>90.8%</td>
<td>87.4%***</td>
</tr>
<tr>
<td>(July 2015-June 2016)</td>
<td>9-Month MALE** for CLI</td>
<td>No cases</td>
<td>0%</td>
<td>13%</td>
<td>20.6%***</td>
</tr>
<tr>
<td>with 9-month LTFU)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Long term follow-up</strong></td>
<td>Long term follow-up rate</td>
<td>No cases</td>
<td>87.5%</td>
<td>88.9%</td>
<td>71.4%</td>
</tr>
</tbody>
</table>

*Freedom from amputation in the ipsilateral limb for at least 9 months among patients treated for critical limb ischemia.

**Major adverse limb event (MALE) is defined as ipsilateral amputation or any reintervention within 9 months among patients treated for critical limb ischemia.

***Only 52% of PVI cases have complete data for these long-term follow-up outcomes, so the VQI benchmarks may be biased. The Vascular Quality Initiative is working to provide timely, relevant and individualized outcomes data to physicians caring for patients with vascular disease. We rely on diligent long-term follow-up data entry to provide this information to our members.
4. REGIONAL QUALITY GROUPS

Regional quality groups distinguish VQI from almost all other registries. Each of the 18 groups hold biannual meetings that provide a forum for discussion and work on quality improvement.

During each region’s biannual meeting, members review and discuss their region’s data. Many groups identify an area for improvement and launch region-wide efforts to improve care. Topics that the groups have chosen to focus on include:

- Use of ultrasound guidance for peripheral interventions
- Increased recording of hemodynamic data (ABI/TBI) prior to peripheral intervention
- Measuring aneurysm sac diameter one year following EVAR and TEVAR
- Renal protection from contrast administration during peripheral interventions
- Increasing rates of IVC filter retrieval
- Reducing LOS for multiple registries
5. QUALITY IMPROVEMENT PROJECTS: LEARNING FROM THE DATA

The QI Community
The SVS PSO is encouraging centers to submit quality improvement charters on projects using VQI data. This process has helped the SVS PSO identify groups working on similar initiatives and facilitate networking opportunities. All members are encouraged to participate in focused group calls whether or not they have a charter. As these projects reach completion, the SVS PSO will aggregate data and share best practices with the full VQI membership.

The SVS PSO also provides resources to assist VQI centers with their QI projects:

- **QI Project Guide and National Initiative Supplement**: These booklets provide the foundation and step-by-step guidance to begin and complete a QI project. The QI Project Guide is designed to assist centers that are just beginning a QI project but may be useful at any stage of the QI process. Subsequently, the SVS PSO created a National Initiative Supplement, which focused on the progress with the two national QI priorities: Optimal Discharge Medications for Vascular Patients and Endovascular AAA Long-Term Follow-Up with Imaging.

- The “Members Only” area of the VQI website (www.vqi.org) offers access to national QI materials, including presentations and videos, as well as a QI discussion forum to encourage interaction among centers.

- National and regional meetings and quarterly calls help VQI data managers share best practices and QI project ideas.

### QUALITY IMPROVEMENT PROJECTS

In response to this new charter initiative, 55 VQI centers have submitted charters in 2018. The charters included the two national initiatives, Discharge Medications and EVAR LTFU Imaging, as well as clinical and documentation topics. Selected charter projects are listed below.

#### Table 5.1 – Quality Improvement Projects to Date

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>PARTICIPATING CENTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge Medications (National Initiative)</td>
<td>20</td>
</tr>
<tr>
<td>LOS (CEA and EVAR)</td>
<td>11</td>
</tr>
<tr>
<td>LTFU (including EVAR Imaging, a National Initiative), IVCF Retrieval</td>
<td>8</td>
</tr>
<tr>
<td>Clinical: Blood Transfusion, AAA Processes, Limb Salvage, SSI</td>
<td>6</td>
</tr>
<tr>
<td>Smoking Cessation</td>
<td>5</td>
</tr>
<tr>
<td>Documentation: Epic Workflow, Preop ABI, PVI Documentation</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>55</strong></td>
</tr>
</tbody>
</table>
6. NATIONAL QUALITY IMPROVEMENT INITIATIVES—DISCHARGE MEDICATIONS AND EVAR LONG-TERM FOLLOW-UP IMAGING

Experienced VQI centers have applied registry data and implemented innovative approaches to improve success rates for these initiatives. The SVS PSO seeks to build on these efforts and help these QI initiatives expand from clusters of innovation to coast-to-coast improvements.

Optimal Discharge Medications for Vascular Patients

The VQI’s first national QI initiative is the prescribing of antiplatelet agents and statins at discharge to improve patients’ long-term vascular health. Discharge medications was selected because it is a treatment that affects most vascular surgery patients and is readily actionable. There is strong evidence that antiplatelet agents and statins increase patient survival. VQI data has shown that patients undergoing arterial procedures who received a discharge prescription of antiplatelet medications and a statin had significantly better 5-year survival. The VQI provided physicians with individual reports showing their prescribing rates for discharge medications and how they compared to their peers. The VQI also disseminated evidence-based information and tools for providers and patients, such as templated communications to primary care physicians, to increase the number of patients receiving optimal medications.

From January 2012 to the present, the prescription of antiplatelets and statins at discharge has risen steadily among VQI members as information about its benefits was disseminated through presentation of the data analysis, publication of the results and sharing of reports with centers and physicians. In addition to the original data analysis and publication led by Randall DeMartino, MD, the SVS PSO provided webinars and presentations at the VQI Annual Meeting as part of this national QI initiative. Individual QI charters and regional presentations continue to reinforce the importance and success of these efforts.

Figure 6.2: Discharge Medications and Statin Rate for 123 VQI Hospitals (2012 to Date)

For example, South Bend Hospital used VQI data to show that only 65.9% of their patients in 2014 received antiplatelet and statin medications. They used a combination of clinical protocols at discharge following a vascular operation, education and workforce reallocation to increase the rate to 97.9% in early 2016. The SVS PSO is now developing a program designed specifically to help centers with the greatest opportunity for improvement.

EVAR Long-Term Follow-Up (LTFU) Imaging

EVAR requires long-term monitoring to ensure the durability of repair. EVAR patients are susceptible to the late development of endoleaks, which can occur in up to 20% of patients and may result in rupture. Recent studies have demonstrated low compliance rates with long-term follow-up imaging after EVAR. To ensure that patients achieve successful outcomes after EVAR, long-term follow-up imaging is essential.
For the 2018 Participation Awards, centers that are above the 2016 75th percentile for EVAR follow-up imaging will receive a point toward their final award (as long as their rate is not significantly lower than their 2017 rate). Centers that are below the 75th percentile but show statistically significant improvement (p-value<.05) over their 2017 rate will also receive a point toward their final award.

The first two lines of the table below show your center’s current antiplatelet+statin rate for 2018 cases. Other rows show the rate of discharge antiplatelet+statin that must be achieved among your expected number of remaining 2018 cases for your center to reach the 75th percentile for 2017, or to show statistically significant improvement over its 2017 rate. Note that the 75th percentile for 2017 has been provided as a benchmark, but the 75th percentile for 2018 cases will likely be different than it was for 2017. Thus, reaching the 75th percentile for 2017 will not guarantee that your center is above the 75th percentile for 2018.

### Discharge Medications (2018 Procedures)
Excludes patients who died in hospital and patients who were not treated for medical reason or non-compliant. Includes CEA, CAS, OAAA, EVAR, TEVAR, INFRA, SUPRA, PVI and LEAMP procedures entered in the VQI as of March 31, 2018.

For the 2018 Participation Awards, centers that are above the 2018 75th percentile for the rate of discharge antiplatelet+statin will receive a point toward their final award (as long as their rate is not significantly lower than their 2017 rate). Centers that are below the 75th percentile but show statistically significant improvement (p-value<.05) over their 2017 rate will also receive a point toward their final award.

The table below shows your center’s current antiplatelet+statin rate for 2018 cases. Other rows show the rate of discharge antiplatelet+statin that must be achieved among your expected number of remaining 2018 cases for your center to reach the 75th percentile for 2017, or to show statistically significant improvement over its 2017 rate. Note that the 75th percentile for 2017 has been provided as a benchmark, but the 75th percentile for 2018 cases will likely be different than it was for 2017. Thus, reaching the 75th percentile for 2017 will not guarantee that your center is above the 75th percentile for 2018.

| Number of 2018 procedures meeting inclusion criteria that your center had entered as of March 31, 2018 | 112 |
| N (%) of 2018 patients receiving antiplatelet+statin | 105 (94%) |
| 75th percentile of antiplatelet+statin rates among VQI centers for 2017 | 89% |
| Your center’s antiplatelet+statin rate for 2017 cases | 90% |
| Estimated total number of procedures your center will enter for 2018* | 493 |
| Estimated number of cases remaining to be entered | 381 |
| If your center is above the 75th percentile for 2017, minimum rate among estimated remaining 2018 cases to stay there | 336/381 (88%) |
| If your center is below the 75th percentile for 2017, minimum rate among estimated remaining 2018 cases to reach the 75th percentile or show statistically significant improvement over your 2017 rate | NA (above 75th percentile) |

*Extrapolated from your center’s case volume for Jan-Mar 2018.

### Follow-Up Imaging After EVAR (2016 Procedures)
Excludes patients who died within 21 months of surgery. “Imaging” includes CT, CTA, MR, MRA, duplex, and/or angiogram imaging between 9 and 21 months of surgery. Time from surgery to imaging = Date of follow-up visit where surgery was recorded — surgery date.

EVAR is used to treat AAA to prevent rupture and improve survival. Patients must have good survival and successful aneurysm exclusion to offset the risk of operation and gain benefit. All EVAR patients should undergo annual imaging to confirm success of the procedure and demonstrate absence of endoleak, which could lead to rupture.

For the 2018 Participation Awards, centers that are above the 2016 75th percentile for EVAR follow-up imaging will receive a point toward their final award (as long as their rate is not significantly lower than their 2015 rate). Centers that are below the 75th percentile but show statistically significant improvement over their 2015 EVAR follow-up imaging rate will also receive a point toward their final award.
The table below shows your center’s current imaging rate for 2016 cases and the number of additional cases with imaging that must be reported for your center to reach the 75th percentile for 2015, or to show statistically significant improvement over its 2015 imaging rate.

Note that the 75th percentile for 2015 has been provided as a benchmark because centers have had a full 21 months to enter follow-up for those cases, but the 75th percentile for 2016 cases will likely be different than it was for 2015. Thus, reaching the 75th percentile for 2015 will not guarantee that your center is above the 75th percentile for 2016.

<table>
<thead>
<tr>
<th>Number of 2018 procedures meeting inclusion criteria that your center had entered as of March 31, 2018</th>
<th>112</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%) of 2018 patients receiving antiplatelet+statin</td>
<td>105 (94%)</td>
</tr>
<tr>
<td>75th percentile of antiplatelet+statin rates among VQI centers for 2017</td>
<td>89%</td>
</tr>
<tr>
<td>Your center’s antiplatelet+statin rate for 2017 cases</td>
<td>90%</td>
</tr>
<tr>
<td>Estimated total number of procedures your center will enter for 2018*</td>
<td>493</td>
</tr>
<tr>
<td>Estimated number of cases remaining to be entered</td>
<td>381</td>
</tr>
<tr>
<td>If your center is above the 75th percentile for 2017, minimum rate among estimated remaining 2018 cases to stay there</td>
<td>336/381 (88%)</td>
</tr>
<tr>
<td>If your center is below the 75th percentile for 2017, minimum rate among estimated remaining 2018 cases to reach the 75th percentile or show statistically significant improvement over your 2017 rate</td>
<td>NA (above 75th percentile)</td>
</tr>
</tbody>
</table>

*Extrapolated from your center’s case volume for Jan-Mar 2018.

“Endovascular aortic aneurysm repair (EVAR) is a non-curative treatment of infrarenal abdominal aortic aneurysm disease. When commercially available devices are used within their instructions for use, excellent long-term rupture-free survival can be anticipated. However, due to the persistent presence of the aneurysm and the life-long risk of device-related failure and/or endoleak, up to 20% of patients may experience some form of aorta-related re-intervention after EVAR. For this reason, long-term follow-up (LTFU) imaging after EVAR is mandatory, and patients need to be educated about this preoperatively and repeatedly during follow-up. It is the obligation of the operating surgeon to stress the need for life-long imaging surveillance and integrate discussions about LTFU into all stages of AAA EVAR care to ensure that their patients achieve durable outcomes.”

—Salvatore Scali, MD, Professor of Surgery, University of Florida
7. VQI DATA ANALYSIS

VQI physicians may request de-identified datasets from each registry for analysis. The SVS PSO Research Advisory Council (RAC) reviews and evaluates requests for datasets by investigators, who provide the RAC a description of their proposed project. These projects have improved clinical care by, for instance, developing practice recommendations for the use of protamine and carotid patching, and for discharge medications. As of October 2018, the RAC has approved 273 projects, and of those, 147 have been published in peer-reviewed journals. In the past year, 99 projects were approved, resulting in 63 publications so far.

See the full digital version of the VQI Annual Report at www.vqi.org for a list of approved proposals and VQI-related publications.

8. USING VQI DATA FOR COLLABORATIVE PROJECTS

Medical devices are an integral component of vascular healthcare. VQI collects clinical data to better understand device performance. Data may be used to meet regulatory requirements to support post-approval surveillance, or expand labeling indications.

Post-Approval Surveillance Projects

The use of VQI data for post-approval surveillance is consistent with the FDA vision of registry-based evaluation. Initial projects have leveraged VQI infrastructure and reduced recruitment time and expenses. For example, the Thoracic Aortic Dissection (TEVAR) project (see p.13) was completed in half the time initially estimated by industry sponsors, Medtronic and Gore.

VQI has partnered with several device manufacturers to provide aggregate data for product development, creation of performance standards, and expansion of device indications:

- **Bard LifeStent® Popliteal Artery Stent Project**: Designed to further evaluate the Bard LifeStent® for treatment of popliteal artery atherosclerosis. The surveillance project will enroll 74 patients and include one-year and two-year follow up.
Expansion of Device Indications
Medical devices are approved for specific-use cases as outlined in the instructions for use (IFU). However, almost all devices are not infrequently used “off-label” for indications not specified in the IFU. Data about off-label use is captured in VQI, offering the potential to provide important information about device performance for non-approved indications. The FDA has indicated that it would consider such data in support of an application for label expansion. Industry projects could combine both historic and prospective VQI data on device performance. 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, greatly reducing project completion time.

Objective Performance Data
Although the treatment of infrainguinal occlusive disease is undergoing rapid change with new stents, balloons, and other devices coming on the market with increasing frequency, it has been more than 10 years since the publication of objective performance criteria (OPC) for the treatment of lower extremity occlusive disease. Regulatory approval of new devices often requires comparison with the contemporary performance of existing techniques and devices. OPCs can provide supplemental or historical data for device evaluation in support of approval. VQI is participating in a project to develop contemporary OPCs for the multiple modalities used in the treatment of infrainguinal occlusive disease.

• Medtronic IN.PACT Admiral DCB ISR Project: Designed to confirm the safety and efficacy of IN.PACT Admiral DCBs for the treatment of in-stent restenosis (ISR) lesions in the superficial femoral and popliteal arteries. This project will enroll 300 patients across 50 sites for one-, two- and three-year follow-up.

• TEVAR Post-Approval Surveillance Projects: Initiated in October 2014, these efforts have demonstrated the value of expanding surveillance to real-world device performance while meeting FDA requirements. In partnership with Gore and Medtronic, the SVS PSO and M2S has completed enrollment of the one-year and five-year cohorts. Follow-up for the one-year cohort is expected to be completed by December 2018.

Registry Assessment of Peripheral Interventional Devices (RAPID)
RAPID is a collaboration of professional societies (Society for Vascular Surgery, American College of Cardiology, Society for Interventional Radiology), academia, industry, CMS, private payers and EMRs. The goal is to develop a coordinated registry network (CRN). The FDA, through the Medical Device Epidemiology Network (MDEpiNet), has promoted the concept of CRNs to generate real-world evidence about medical device performance. Data are aggregated from multiple registries to evaluate and monitor endovascular devices and may be used to create an objective performance criterion (OPC). The initial phase (completed) developed core data elements and definitions that can be used by all registries and incorporated unique device identifiers. The next phase is to perform a registry-based analysis of device performance and create an OPC for infrainguinal occlusive disease.

Transcarotid Artery Revascularization (TCAR) Surveillance Project (TSP)
TSP is a unique effort that allows CMS to reimburse centers performing TCAR based on a national coverage determination. Centers participate in the TSP by entering patients into the VQI registry to allow the SVS PSO to assess the safety and efficacy of TCAR in comparison to the standard treatment, carotid endarterectomy. This project will enroll more than 15,000 subjects with one-year follow-up.

To date, 176 centers have contributed more than 3,195 TCAR cases to the CEA registry. This represents the largest dataset of information on TCAR procedures. In June 2018, two papers highlighting preliminary results of the study were presented at the SVS Vascular Annual Meeting.

• In-hospital Outcomes of Transcarotid Artery Revascularization (TCAR) and Carotid Endarterectomy (CEA) in the SVS Vascular Quality Initiative. Marc L. Schermerhorn, MD, Hanaa Dakour Aridi, MD, Vikram S. Kashyap, MD, Grace J. Wang, MD, MS, Brian Nolan, MD, MS, Jack Cronenwett, MD, Jens Eldrup-Jorgensen, MD, Mahmoud B. Malas, MD, MHS, JVS, June 2018.

• Transcarotid Artery Revascularization (TCAR) vs. Transfemoral Carotid Artery Stenting (TFCAS) in the SVS Vascular Quality Initiative. Mahmoud B. Malas, MD, MHS, Hanaa Dakour Aridi, MD, Grace J. Wang, MD, MS, Vikram S. Kashyap, MD, Raghu Motaganahalli, MD, Jens Eldrup-Jorgensen, MD, Jack Cronenwett, MD, Marc L. Schermerhorn, MD, JVS, June 2018.
CREST-2 Registry
This randomized, controlled clinical trial compares CEA and CAS to best medical therapy, and the VQI is one of two registries supporting the trial. 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 interventionists used VQI to report more than 1,771 CAS procedures for the CREST-2 Registry project. VQI participation in the CREST-2 Registry facilitates enrollment and participation by leveraging VQI infrastructure.

Corporate Contributions to Ongoing VQI Programs
The operations of the SVS PSO are financed by fees paid by participating sites. New project development, including addition of new registries, quality reports, and improved functionality in VQI has been made possible through generous unrestricted contributions by Quality Champion, Quality Partner and Quality Associate-level corporations. Corporate supporters of the SVS PSO for the past year are listed below:

Quality Champions

Quality Partners

Quality Associates

INTERNATIONAL CONSORTIUM OF VASCULAR REGISTRIES (ICVR)
The mission of the ICVR is to provide a collaborative platform through which registries and other stakeholders around the world can share data to improve vascular health care. The VQI is participating in this effort, along with Vascunet, a sub-committee of the European Society of Vascular Surgeons, among others. The ICVR will provide:

- Development and testing of innovative methodological approaches
- Forums for discussion: workshops, conferences
- Safety studies, surveillance and comparative outcome evaluation
- Collaboration/peer-reviewed articles and white papers

Other participants include national device regulators and medical device manufacturers. Current projects include The Vascular Implant Surveillance and Interventional Outcomes Network (VISION) initiative in the US, which aims to develop a national device surveillance network. There also are two current ICVR prospective AAA device-performance projects, both of which aim to enroll consecutive patients for two years. An evaluation of treatment of ruptured AAA is under development and has the potential to lead to label expansion. Other projects include management of carotid and lower extremity arterial occlusive disease. For more information on the ICVR, please see http://www.icvr-initiative.org/
9. FUTURE DEVELOPMENT

In 2019, the VQI plans to support improved care and promote patient safety in the following areas:

- **30-Day Data Entry Forms**: to better document post-operative outcomes (a key interest of hospitals and CMS)

- **Vascular Medicine Registry**: to collect data on medical (or non-operative) management of peripheral artery disease (AAA, claudication, and carotid artery stenosis). This new registry is a collaboration between the SVS PSO and the Society for Vascular Medicine (SVM) to try to define the natural history and best medical management of patients not requiring an operation.

- **Venous Stent Registry**: to collect data on the management and outcomes of venous stents placed for lower extremity occlusive disease. This new registry is a collaboration among the SVS PSO and industry partners with input from the FDA.

- **Vascular Ultrasound Registry**: to collect and analyze vascular laboratory data, initially focused on diagnosis and treatment of carotid artery disease. This new registry will match ultrasound images with VQI clinical data in the CEA and CAS registries.

**POTENTIAL BENEFITS FROM VQI FOR KEY STAKEHOLDERS**

**For Patients**
- Improved care based on VQI data and quality initiatives
- Using benchmarks and best practices to reduce length of stay
- Improved long-term care through emphasis on follow-up and secondary prevention

**For Physicians/Providers**
- Developing best practices through VQI data analysis
- Identify meaningful benchmarks for QA and QI efforts
- Better patient selection using VQI risk assessment calculators

**For Policy-Makers**
- Better data to inform decision making on policy development
- Monitoring safety and efficacy using real world evidence
- Work collaboratively with the SVS to develop quality measures

**For Payers**
- Adoption of best practices to reduce complications and expenses
- Comparative data to inform population health approaches
- Reduction of expenses due to decreased length of stay and resource utilization

**For Industry**
- Enhanced efficiency for label expansion using registry data
- Registry-based trials for pre-market approval and post-market surveillance
- Better data for device monitoring
APPENDIX A — VQI SITES LISTED BY STATE, AS OF OCTOBER 1, 2018

UNITED STATES
Abington Memorial Hospital PA
Advocate Good Samaritan Hospital IL
Aimacare Regional Medical Center NC
Albany Vascular Surgical Center GA
Alexian Brothers Medical Center IL
Allegro Health Network - Allegro Clinic Vascular Surgery WI
Allina- Abbott Northwestern Hospital MN
Allina- Mercy Hospital MN
Allina- United Hospital MN
Allina- Unity Hospital MN
Altru Health System ND
Arizona Endovascular Center AZ
Amol Health NY
Associates in Vascular Care NJ
Aultman Hospital OH
Aurora Baycare Medical Center WI
Aurora Lakeland Medical Center WI
Aurora Medical Center in Kenosha WI
Aurora Medical Center in Manitowoc County WI
Aurora Medical Center in Oshkosh WI
Aurora Medical Center in Summit WI
Aurora Medical Center in Washington County WI
Aurora Medical Center of Grafton WI
Aurora Memorial Hospital of Burlington WI
Aurora Sheboygan Memorial Medical Center WI
Aurora Sinai Medical Center WI
Aurora St. Luke’s Medical Center WI
Aurora St. Luke’s South Shore WI
Aurora West Allis Medical Center WI
Avery Heart Hospital of South Dakota SD
Baptist Health Lithia Springs FL
Baptist Health Madisonville- Jack L. Hammern Heart & Vascular Center KY
Baptist Memorial Hospital- Memphis TN
Barnes Jewish Hospital MO
Baton Rouge General Medical Center LA
Bayfront Health Seven Rivers FL
Bayor All Saints Medical Center TX
Bayor- Jack and Jane Hamilton Heart and Vascular Hospital TX
Bayor- The Heart Hospital Denton TX
Bayor- The Heart Hospital Plano TX
Bayor University Medical Center TX
Baystate Medical Center MA
Beaumont Memorial Hospital SC
Beaumont Royal Oak Hospital MI
Beebe Healthcare DE
Berkshire Medical Center MA
Beth Israel Deaconess Medical Center MA
Bethesda Holy Spirit Hospital (TriHealth, Inc.) OH
Borgess Hospital MI
Boston Medical Center MA
Brigham and Women’s Hospital MA
Bronson Battle Creek Hospital MI
Bronson Methodist Hospital MI
BSA Hospital TX
Calden Clark Medical Center WV
Cape Cod Hospital MA
Capital Health Medical Center - Hopewell NJ
Capital Health Regional Medical Center NJ
Carlton Ronan Memorial Hospital VA
Carle Foundation Hospital IL
Carolinas Healthcare - Pineville NC
Carolinas Healthcare System- Sanger Heart & Vascular Institute NC
Carondelet Specialists Group AZ
Carson Tahoe Regional Hospital NV
Catholic Health Mercy Hospital of Buffalo NY
Catholic Health Sister of Charity Hospital NY
CTSA NH
CEDARS-SINAI Medical Center CA
Celebration Health FL
Centra Health (Lynchburg General Hospital) VA
Central Florida Regional Hospital FL
Central Maine Medical Center ME
Centura- Penrose St. Francis Health Services CO
Centura- Porter Adventist Hospital CO
Centura- St. Mary Corwin Medical Center CO
Charleston Area Medical Center WV
Chester County Hospital PA
Cheyenne Regional Medical Center WY
Chi Health Nebraska Heart NE
Christiana Care Health System DE
C.J.W Medical- Chippenham Hospital VA
C.J.W Medical- Johnston-Wilis Hospital VA
Cleveland Clinic, Heart and Vascular Institute OH
Coastal Vascular & Interventional, PLLC FL
Cobb Hospital, Inc. (WellStar Health System, Inc.) GA
Columbia St. Mary- Milwaukee WI
Columbia St. Mary- Ozaeeke WI
Columbia Ven Vascular Services, Inc. MO
Columbia University Irving Medical Center NY
Columbus Regional Hospital IN
Community Hospital East IN
Community Hospital Memorial Heart & Vascular IN
Community Hospital South IN
Concord Hospital NH
Cone Health Heart & Vascular Center NC
Confluence Health WA
Cooper University Medical Center NJ
Covenant HealthCare MI
CVTs- CardioThoracic Vascular Surgeons TX
Danbury Hospital CT
Dartmouth Hitchcock Medical Center NH
Deltay Medical Center, Inc. FL
Diagnostic Imaging of Milford CT
Dignity Health (Sequoia Hospital) CA
DMC Harper University Hospital MI
Doyelstown Hospital PA
Duke University Medical Center NC
Eastern Maine Medical Center ME
El Camino Hospital CA
Elihart General Hospital IN
Eliot Hospital NH
Emory Healthcare GA
Emory St. Joseph’s Hospital GA
Englewood Hospital and Medical Center NJ
Excella Health PA
Fairfax- Fairfax Surgery Center VA
Fairview- Southdale Hospital MN
Fairview- University of Minnesota Medical Center MN
Fletcher Allen Healthcare VT
Flint Hills Heart, Vascular, and Vein Clinic, LLC KS
Florida Hospital FL
Florida Hospital Memorial Medical Center FL
Floyd Medical Center GA
Forest General Hospital Vascular ServicesMS
Froedtert Memorial Lutheran Hospital WI
Geisinger Community Medical Center PA
Geisinger Medical Center PA
Geisinger Wyoming Valley Medical Center PA
Glynd Vein Clinic IL
Glens Falls Hospital NY
Good Samaritan Hospital (TriHealth, Inc.) OH
Goshen Hospital IN
Grady Memorial Hospital GA
Gregory L. Nederian, M.D., P.A. FL
Greenville Clinic
Hackensack Meridian- Bayshore Community Hospital NJ
Hackensack Meridian- Hackensack University Medical Center NJ
Hackensack Meridian- Jersey Shore University Medical Center NJ
Hackensack Meridian- Ocean Medical Center NJ
Hackensack Meridian- Riverview Medical Center NJ
Hackensack Meridian- Southern Ocean Medical Center NJ
Harborview Medical Center WA
Harlingen Medical Center TX
Harrison Medical Center (CHI Franciscan Health) WA
Hartford Hospital CT
Health Park Medical Center (Lee Memorial Health System FL)
Heart Hospital of Lafayette LA
Heart Hospital of New Mexico at Lovelace Medical Center NM
Henry County Medical Center TN
Henry Ford Allegiance Health MI
Henry Ford Hospital MI
Henry Ford Hospital West Bloomfield MI
Hoag Memorial Hospital Presbyterian CA
Hoag Vascular Service CA
Holy Spirit - Geisinger Affiliate PA
Horizon Vascular Specialists MD
Hospital of Central Connecticut (Hartford Healthcare) CT
Hospital of the University of Pennsylvania PA
Houston Methodist St. John Hospital- Clear Lake TX
Inova Alexandria Hospital VA
Inova Fairfax Hospital VA
Inova Fairfax Hospital VA
Inova Loudoun Hospital VA
Inova Mount Vernon Hospital VA
Integris Baptist Medical Center, Inc. OK
Iowa Heart Center at Mercy Medical Center IA
IU Health- Arnett Hospital IN
IU Health- Ball Memorial Hospital IN
IU Health- Bloomington Hospital IN
IU Health- Methodist Hospital IN
IU Health- Saxony Hospital IN
Jackson Madison General Hospital TN
Johns Hopkins Hospital MD
Johns Hopkins Bayview Medical Center MD
Kadlec (Providence) WA
Kaleida- Buffalo General Hospital NY
Kennedy University Hospital NJ
Kensentone Hospital, Inc. (WellStar Health System, Inc.) GA
KentuckyOne Health- Jewish East KY
KentuckyOne Health- Jewish Hospital KY
King’s Daughters Medical Center KY
Lahey Hospital and Medical Center MA
Lake Health - West Medical Center OH
Lakes Region General Hospital NH
Lancaster General Hospital PA
Lee Memorial Healthcare System (Gulf Coast Medical Center) FL
Lehigh Valley Hospital PA
Lifespan- Rhode Island Hospital RI
Lifespan- The Miriam Hospital RI
Loma Linda University Medical Center CA
Loyola University Medical Center IL
Lutheran Health System of Indiana (OM Health System) IN
Lyster Baptist Neurosurgery FL
Maimonides Medical Center NY
Main Medical Center ME
MaineGeneral Medical Center ME
Marin General Hospital CA
Mary Washington Hospital VA
Massachusetts General Hospital MA
Mayo Clinic MN
Mayo Clinic Arizona AZ
Mayo Clinic Florida FL
Mayo Clinic Health System -- Northwest Wisconsin Region, Inc. WI
McLaren Bay Region MI
McLaren Regional Medical Center d/b/a Flint MI
McLeod Regional Medical Center SC
Medical Center Hospital TX
Medical University of South Carolina Hospital SC
Medstar Georgetown University Hospital DC
Medstar Good Samaritan Hospital MD
Medstar Union Memorial Hospital MD
MedStar Washington Hospital Center DC
Memorial Hermann Greater Heights Hospital TX
Memorial Hermann Heart & Vascular Institute- Texas Medical Center TX
Memorial Hermann Katy Hospital TX
Memorial Hermann Memorial City Medical Center TX
Memorial Hermann Northeast Hospital TX
Memorial Hermann Southeast Hospital TX
Memorial Hermann Southwest Hospital TX
Memorial Hermann Sugar Land TX
Memorial Hermann The Woodlands Hospital TX
Memorial Hospital of South Bend IN
Memorial Hospital Pembroke FL
Memorial Hospital West FL
Memorial Regional Hospital FL
Memorial University Health Medical Center- ShVII GA
Mercy Hospital Springfield MO
Mercy Hospital St. Louis MO
Mercy Medical Center OH
Mercy Medical Center-Baltimore MD
Miami Vein Center FL
Michigan Vascular Center MI
Midwest Institute Minimally Invasive Therapies IL
Midwest Physician Alliance (Heart Care Center of Illinois - Premier Vascular, LLC) IL
www.VQI.org
APPENDIX A— VQI SITES LISTED BY STATE, AS OF OCTOBER 1, 2018

Mission Hospital NC
Mobile Infirmary AL
Montefiore Medical Center NY
Morton Plant Hospital (HCA Healthcare System) FL
Mount Sinai- Beth Israel Hospital NY
Mount Carmel St Ann’s Hospital OH
Mount Carmel East Hospital OH
Mount Carmel St Joseph Hospital OH
Mount Sinai Hospital NY
Mount Sinai- St Luke’s Roosevelt Hospital Center NY
Multicare Good Samaritan Hospital WA
Multicare Defiance Regional Hospital WA
Nashville Vascular & Vein Institute TN
Nebraska Medical Center NE
New Hanover Regional Medical Center NC
Newark Beth Israel Medical Center (Barnabas Health) NJ
North Okalolaoso Medical Center FL
Northeast Georgia Hospital GA
NorthShore University Health- Northshore Skokie Hospital IL
Northside Hospital Atlanta GA
Northside Hospital Cherokee GA
Northside Hospital Forsyth GA
Northwest Hospital & Medical Center WA
Northwestern Medicine Central DuPage Hospital IL
Northwestern Memorial Hospital IL
Norton Healthcare, Inc.- Norton - Audubon KY
Norton Healthcare, Inc.- Norton - Brownsboro KY
Norton Healthcare, Inc.- Norton - Downtown KY
Norton Healthcare, Inc.- NWCH - St. Matthews KY
Novant Health Medical Center NC
Novant Health Medical Center NC
Novant Health Presbyterian Medical Center NC
NSLU- Lenox Hill Hospital NY
NSLU- Long Island Jewish Medical Center NY
NSLU- North Shore University Hospital NY
NSLU- Staten Island Hospital- North Site NY
NYP/Well Cornell Medical College NY
NYU Langone Medical Center NY
Ochsner Medical Center LA
OhioHealth Doctors Hospital OH
OhioHealth Dublin Methodist Hospital OH
OhioHealth Grady Memorial Hospital IN
OhioHealth Grant Medical Center OH
OhioHealth Mansfield Hospital OH
OhioHealth Marion General Hospital OH
OhioHealth Riverside Methodist Hospital OH
Ohio Heart Hospital South, LLC KY
Ohio Heart Hospital, LLC OK
Ohio Heart Institute at Hillcrest Medical Center OH
Orange Regional Medical Center NY
Oregon Health & Sciences University OR
Oregon Vascular Specialists, LLC OR
Orlando Health Dr P Phillips Hospital FL
Orlando Health- Health Central Hospital FL
Orlando Health- Orlando Regional Medical Center FL
Orlando Health- South Seminole Hospital FL
OSF- Saint Anthony Medical Center IL
OSF- Saint Francis Medical Center IL
OSF- St. Joseph Medical Center IL
Our Lady of the Lake LA
Overlook Hospital (Atlantic Health System) NJ
Palmetto Health Cayce SC
Pal Alto Medical Foundation CA
Penn Presbyterian Medical Center PA
Penn State Milton S Hershey Medical Center PA
Pennsylvania Hospital PA
Peripheral Vascular Associates TX
Piedmont Athens Regional Medical Center, Inc. GA
Piedmont Hospital Atlanta GA
Pinehurst Surgical NC
Portsmouth Regional Hospital NH
Presbyterian Hospital NM
Presbyterian St. Joseph’s Medical Center CO
Prime Healthcare Foundation - Southern Regional Medical Center GA
ProHealth Care (Waukesha Memorial Hospital) WI
ProMedica Toledo Hospital, Jobst Vascular OH
Providence Alaska Medical Center AK
Providence Holy Cross Medical Center CA
Providence Holy Family Hospital WA
Providence Little Company of Mary Torrance CA
Providence Medford Medical Center OR
Providence Portland Medical Center OR
Providence Regional Medical Center WA
Providence Sacred Heart Medical Center WA
Providence Saint Joseph Medical Center CA
Providence St. Mary Medical Center WA
Providence St. Vincent Medical Center WA
Providence Tarzana Medical Center CA
Radiology Associates - Fox Valley WI
Rain City Regional Hospital SD
Redmond Regional Medical Center GA
Regents of the University of New Mexico NM
Regional Medical Center of Orangeburg & Coastal Carolina SC
Rex Healthcare (UNC Health System) NC
Roper St. Francis Hospital SC
Rose Medical Center CO
Rush Foundation Hospital MS
Russel C. Lam MD PA TX
Rutgers Robert Wood Johnson Medical School NJ
Saint Barnabas Medical Center (Barnabas Health) NJ
Saint Francis Hospital and Medical Center CT
Saint Francis Medical Center MO
Saint Joseph Hospital (SCL Health) CO
Saint Joseph Medical Center IN
Saint Luke’s Hospital of Kansas City MO
Saint Thomas Midtown Hospital TN
Saint Thomas Rutherford Hospital TN
Saint Thomas Hospital TN
San Diego Vascular Associates CA
Sanford Clinic Vascular Associates SD
Sarasota Memorial Hospital FL
Scott & White Memorial Hospital TX
Scipps Green Hospital (Scipps Health) CA
Scipps Mercy Hospital (Scipps Health) CA
Self Surgery & Vein Care WA
Sentara Careplex Hospital VA
Sentara Leigh Hospital VA
Sentara Martha Jefferson VA
Sentara Norfolk General Hospital VA
Sentara Northern Virginia VA
Sentara Obici Hospital VA
Sentara Princess Anne Hospital VA
Sentara RMH Medical Center VA
Sentara Virginia Beach General Hospital VA
Sentara Williamsburg Regional Medical Center VA
Sharp Grossmont Hospital CA
Shanghai General Hospital, Shanghai CA
Shih - Memorial Hospital of Carbondale IL
Siroga TN
SU School of Medicine, Medicine Medical Center
Southcoast- Charlton Memorial Hospital MA
Southcoast- St. Luke’s Hospital MA
Spartanburg Health Services District, Inc. SC
Spectrum Health Hospital MI
SSM DePaul Health Center MO
SSM Health St. Louis University Hospital MO
SSM St. Anthony Hospital OK
SSM St. Clare Health Center MO
SSM St. Joseph Health Center MO
SSM St. Mary Health Center MO
St. Anthony Medical Center (CHI Franciscan Health) WA
St. Anthony’s Hospital (BayCare Health System) FL
St. Anthony’s University Medical Center MO
St. Charles Health System, Inc. OR
St. Charles Hospital NY
St. Elizabeth’s Medical Center MA
St. Francis Health Center IN
St. Francis Medical Center (CHI Franciscan Health) WA
St. John’s Health Center (Providence) CA
St. Luke's Health- Emeryville Medical Center MO
St. Luke's Hospital & Health Network - Allentown Campus PA
St. Luke’s Hospital & Health Network - Anderson Campus PA
St. Luke’s Hospital & Health Network - Bethlehem Campus PA
St. Luke’s Hospital (fr/k/a Saint Luke’s Episcopal Hospital) KY
St. Luke’s Hospital MO
St. Luke’s Methodist Hospital (UnityPoint) IA
St. Mary Medical Center PA
St. Mary’s Hospital WI
St. Mary’s Hospital (SCL Health) CO
St. Mary’s Medical Center WY
St. Patrick Hospital (Providence) MT
St. Vincent Healthcare (Providence Health) MT
St. Vincent Heart Center of Indiana, LLC IN
St. Vincent Hospital & Healthcare Center IN
Stanford Hospital & Clinics CA
Steadward Good Samaritan Medical Center, Inc. MA
Steward St. Anne’s Hospital Corporation MA
Steward Trumbull Memorial Hospital, Inc. OH
Stockton Cardiothoracic Surgical Medical Group, CA
Stony Brook University Medical Center NY
Strong Memorial Hospital, University of Rochester Medical Center NY
Summa Health System OH
SUNY Upstate- University Hospital Medical Center NY
Surgical Specialists of Central Florida FL
Swedish Cherry Hill (Providence) WA
Swedish Edmonds (Providence) WA
Swedish First Hill (Providence) WA
Tampa General Hospital FL
Tenet Florida Physical Medicine and Rehabilitation, LLC FL
The Johns Hopkins Hospital MD
The Medical Center Navicent Health (The Medical Center of Central Georgia, Inc.) GA
The MetroHealth System OH
The Ohio State University, Wexner Medical Center OH
The Practice of John F Lucas III, M.D. MS
The Reading Hospital and Medical Center PA
The University of Arizona Medical Center- University Campus AZ
The University of California Irvine Medical Center CA
The University of Texas M.D. Anderson Cancer Center TX
The University of Texas Southwestern Medical Medical Center TX
The Vascular Group NY
The Vein and Vascular Institute of Tampa Bay FL
Thomas Jefferson University Hospitals, Inc. PA
Tift Regional Medical Center GA
Trident Medical Center SC
Tucson Medical Center AZ
Tufts Medical Center MA
UCHA- Memorial Hospital Central CO
UCHA- Memorial Hospital Central CO
UCLA- Harbor Medical Center, Los Angeles County CA
UCLA- Ronald Reagan Medical Center CA
UCSD Medical Center CA
UCSF Medical Center CA
UI Health- Shands Hospital FL
United Hospital Center WV
UnityPoint Health- Des Moines IA
University of Washington Medical Center WA
University Hospitals Health System OH
University of Alabama AL
University of Chicago Medical Center IL
University of Colorado - Denver CO
University of Colorado- North Vascular Services CO
University of Iowa IA
University of Kansas Medical Center KA
University of Kentucky KY
University of Maryland Medical Center MD
University of Massachusetts Memorial Hospital MA
University of Michigan MI
University of Mississippi Medical Center MS
University of Missouri Medical Center MO
University of North Carolina Hospitals NC
University of Tennessee Medical Center TN
University of Texas Health Science Center, San Antonio TX
University of Utah Hospital and Clinics UT
University Surgical Associates TN
APPENDIX A— VQI SITES LISTED BY STATE, AS OF OCTOBER 1, 2018

UPMC Altoona PA
UPMC / UPP Vascular Surgery PA
UPMC/Hamot Hospital PA
USC University Hospital - Keck Hospital CA
UVA Medical Center (UVA Health System) VA
Vanguard Vascular & Vein TX
Vascular & General Surgical Specialists of SWFL FL
Vascular Associates of South Alabama AL
Vascular Institute of Chattanooga TN
Vascular Institute of Michigan MI
Vascular Surgery Associates FL
Abrazo Arizona Heart Hospital AZ
Vidant Medical Center NC
Virginia Commonwealth University Hospital Authority VA
Virginia Mason WA
Wadley Regional Medical Center TX
Wake Forest Baptist Health NC
WakeMed Health & Hospitals -- Cary Campus NC
WakeMed Health & Hospitals -- Raleigh Campus NC
Washington Hospital Health System CA
Weiss Memorial Hospital IL
West Virginia University Hospitals, Inc. WV
Weschechter Medical Center NH
Western Maryland Health System MD
Western Vascular Institute AZ
White Plains Medical Center NY
Wills-Knighton North LA
Winchester Medical Center VA
Wright State Physician Group OH
Yale-New Haven Hospital CT
Yavapai Regional Medical Center AZ

APPENDIX B— SOCIETY FOR VASCULAR SOCIETY PATIENT SAFETY ORGANIZATION (SVS PSO)

The Patient Safety and Quality Improvement Act of 2005 authorized the creation of Patient Safety Organizations (PSOs) to improve the quality and safety of health care by the collection and analysis of patient data. It protects any comparative outcome analyses or other aggregated reports that are generated by a PSO from discovery in state and federal court. These analyses and reports, called Patient Safety Work Products (PSWP), can be used for quality improvement but not for disciplinary action against a provider. It allows patients identifiers to be collected, without specific IRB or patient approval. This permits a PSO to match patients with other data sources, such as the Social Security Death Index or Medicare claims data to evaluate long-term effectiveness of procedures in terms of mortality or complications. The identity of patients, hospitals and providers cannot be disclosed by a PSO, although non-identifiable data can be published for quality improvement research, adhering to both PSO and HIPAA requirements. VQI embraced the use of a PSO to house its activities, because it provides substantially more security and protection than most registries.

VQI ENDORSING SOCIETIES
American Venous Forum*
Canadian Society for Vascular Surgery
Eastern Vascular Society
Florida Vascular Society
Georgia Vascular Society
Michigan Vascular Society
Midwestern Vascular Surgical Society
New England Society for Vascular Surgery
New York Society for Vascular Surgery
Peripheral Vascular Surgery Society
Rocky Mountain Vascular Surgery Society
Society for Clinical Vascular Surgery
Society for Vascular Medicine*
Society of Interventional Radiology*
Society for Vascular Ultrasound*
Southern Association for Vascular Surgery
Southern California Vascular Surgical Society
Vascular Access Society of America*
Western Vascular Society

*Members of SVS PSO Governing Council

APPENDIX C— MEDSTREAMING/M2S CLINICAL PLATFORM

M2S PATHWAYS™ is a secure, cloud-based solution which enables physicians, institutions, clinical data managers, and researchers to collect, manage, analyze, and disseminate their clinical data to achieve optimal outcomes. Accessible by any compatible browser, PATHWAYS is designed to easily integrate into a variety of workflows by allowing multiple users to access and enter data on a single procedure form, and to spread the responsibilities of data entry to more than one individual. Authentication identifies users’ roles and permissions to ensure appropriate access to content within PATHWAYS. Real-time data validation through error-trapping and alerts ensure that only high-quality data is populated into the system. PATHWAYS has been designed to support large-scale quality improvement and research projects as dynamic content within registries can easily be added and/or modified.

Medstreaming-M2S is a medical informatics company specializing in workflow productivity technology, registry development and support services. To address challenges created by fragmentation of clinical data, Medstreaming created specialty-based workflow applications, which improves data workflow in electronic medical records (EMR) systems. Using this clinical workflow expertise, Medstreaming has also developed an integrated platform application that runs as an outpatient EMR, image management and reporting, and practice management workflow solution. All Medstreaming solutions act as aggregators for structuring clinical data which in turn creates powerful data service offerings for multi-purpose, web based, data mining and data analytics. Medstreaming is headquartered in Redmond, WA. M2S, a division of Medstreaming, is a healthcare performance management solutions company that provides innovative technology and services for the healthcare industry to manage clinical information and utilize that information to improve the quality of patient care and reduce costs. The Vascular Quality Initiative is built on M2S’s PATHWAYS clinical data performance platform, allowing users to track, measure, and analyze clinical information, promote collaboration, objectively drive decisions, and optimize performance. For more information, visit www.m2s.com.