Pacific Northwest Vascular Study Group

November 1, 2018
1pm-3pm
Seattle, WA
Edgewater Hotel
PLEASE SIGN THE ATTENDANCE SHEET
Agenda (draft)

I. Welcome and Introduction
   Stephen Murray, MD

II. National VQI Update
    Cheryl Jackson, PSO

III. RAC Update
     Wayne Zhang, MD

IV. AQC Update
    Nam Tran, MD

V. VQC Update
   Timothy Liem, MD

VI. GC Committee Update
    Stephen Murray, MD

VII. Regional Data Review
     Stephen Murray, MD

VIII. Presentations
      Alejandro Perez, MD
      Ben Starnes, MD/Amanda Sigala, RN

IX. Meeting Evaluation
    Stephen Murray, MD

X. Future Meetings
   Stephen Murray, MD

XI. Data Manager Report
    Karin Bussard/Amy Manning
Welcome and Introductions

Good Samaritan Hospital
Harrison Medical Center
Oregon Vascular Specialists, LLC
Seattle Vascular Surgery
St. Anthony Hospital
St. Charles Health System
St. Francis Hospital
St. Joseph Medical Center
Tacoma General Hospital
Confluence Health
Harborview Medical Center
Kadlec Regional Medical Center
Northwest Hospital and Medical Center
Oregon Health & Science University

Providence Alaska Medical Center
Providence Holy Family Hospital
Providence Medford Medical Center
Providence Portland Medical Center
Providence Regional Medical Center Everett
Providence Sacred Heart Medical Center
Providence St. Mary Medical Center
Providence St. Peter Hospital
Providence St. Vincent Medical Center
Swedish Cherry Hill
Swedish Edmonds
Swedish First Hill
University of Washington Medical
Virginia Mason
# Pacific NW – Potential Sites

<table>
<thead>
<tr>
<th>Hospital/Center</th>
<th>City, State</th>
<th>Contact</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska Regional</td>
<td>Anchorage, AK</td>
<td>Dr. John Cooper</td>
<td>Contracting</td>
</tr>
<tr>
<td>Asante Health</td>
<td>Ashland, OR</td>
<td>Dr. Mitch Plummer</td>
<td>Prospect</td>
</tr>
<tr>
<td>PeaceHealth - 4 Sites</td>
<td>Vancouver, WA</td>
<td>Need physician contact</td>
<td>Prospect</td>
</tr>
</tbody>
</table>
National VQI Update:
Cheryl Jackson, SVS PSO
Number of Participating Centers

Location of VQI Participating Centers

493 Centers, 46 States + Canada
Total Procedure Volume tab reflects net procedures added to the registry for the month.

### VQI Total Procedure Volume

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral Vascular Intervention</td>
<td>162,009</td>
</tr>
<tr>
<td>Carotid Endarterectomy</td>
<td>107,121</td>
</tr>
<tr>
<td>Infra-Inguinal Bypass</td>
<td>47,829</td>
</tr>
<tr>
<td>Endovascular AAA Repair</td>
<td>43,217</td>
</tr>
<tr>
<td>Hemodialysis Access</td>
<td>42,431</td>
</tr>
<tr>
<td>Carotid Artery Stent</td>
<td>23,428</td>
</tr>
<tr>
<td>Varicose Vein</td>
<td>22,841</td>
</tr>
<tr>
<td>Supra-Inguinal Bypass</td>
<td>16,009</td>
</tr>
<tr>
<td>Thoracic and Complex EVAR</td>
<td>12,398</td>
</tr>
<tr>
<td>Lower Extremity Amputations</td>
<td>11,873</td>
</tr>
<tr>
<td>Open AAA Repair</td>
<td>11,295</td>
</tr>
<tr>
<td>IVC Filter</td>
<td>10,721</td>
</tr>
</tbody>
</table>

**Total Procedures Captured (as of 9/1/2018): 511,172**
Data Audits starting in 2018!!

- **Inter-rater reliability exercise:** We asked for volunteers to abstract identical cases for selected registries to see how often they agree/disagree. This will let us identify problem data elements that we can improve with better help text and/or training.

- **Random Center Audits:** we plan to audit random cases at selected centers in order to 1) estimate the overall VQI data-element error rate, and 2) identify areas for improvement. Details to come!

- **New PSO-Center Communication Tool for Data Cleanup:** We will use our new web-based “Audit Tool” to ask centers to verify/correct suspicious data entries (out of range, improbable or impossible values in specific records).
Educational Webinars 2018

August: TEVAR case abstraction  
            30 day follow up
September: Validation Case Study! ROI  
            Failure modes and effects analysis
October: LTFU required fields
November: Wrapping up a QI project, 2019  
            Participation Award information
December: Hemodialysis Registry Changes  
            Stroke S/S and how to abstract
2018 reporting schedule

- **July**: Fall Regional Reports
- **July**: Pilot System-Level Fall Reports for Inova and Ohio Health *(new!)*
- **August**: COPI Report: INFRA LOS/Physician Dashboards *(new!)*
- **October**: QI Initiative Update
- **November**: Cumulative Physician Dashboards *(new!)*
Registry Updates:

- Hemodialysis Access: Under major revision with release in 2019 (TBD)
- Vascular Medicine Registry: Finalizing changes for release in 2019 (TBD)
- 30-day Follow-up Measures: Nov 2018
- Varicose Vein: Under revisions to only collect data on treated leg (shorten the form)
- Venous Stent Registry: Under development
- PVI short form: Under development
Social Security Numbers

Having the SSN in the record allows us to:

- Match patients with the Social Security Death Index which allows accurate assessment of mortality following vascular procedures
- Match patients in VQI to their respective Medicare claims to assess long term outcomes which greatly enhances the length of follow up without requiring data entry
- M2S has designed its security and privacy protocols to ensure PHI is safeguarded in accordance with HIPAA and HITECH. PHI is encrypted both while being transmitted and when data is at rest.

VQI is organized under the legal structure of a patient safety organization (PSO) which has greater data protection than most!!
<table>
<thead>
<tr>
<th>Title</th>
<th>Registry</th>
<th>Enrolling</th>
<th>Targets</th>
<th>Follow-Up</th>
<th>Typical $ Per Patient</th>
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</thead>
<tbody>
<tr>
<td>TCAR Surveillance Project</td>
<td>CAS</td>
<td>Yes</td>
<td>-</td>
<td>1 yr</td>
<td>NCD</td>
</tr>
<tr>
<td>Bard® LifeStent® Popliteal Artery Stent Project</td>
<td>PVI</td>
<td>Yes</td>
<td>74 pts 30 sites</td>
<td>1, 2 yr</td>
<td>$1400</td>
</tr>
<tr>
<td>Medtronic IN.PACT® Admiral® DCB ISR Project</td>
<td>PVI</td>
<td>Yes</td>
<td>300 pts 50 sites</td>
<td>1, 2, 3 yr</td>
<td>$1950</td>
</tr>
<tr>
<td>CREST 2 Registry</td>
<td>CAS</td>
<td>Yes</td>
<td>-</td>
<td>1 yr</td>
<td>-</td>
</tr>
<tr>
<td>TEVAR Dissection Surveillance Project</td>
<td>TEVAR</td>
<td>No*</td>
<td>600 pts 50 sites</td>
<td>30 day 1, 2, 3, 4, 5 yr</td>
<td>$4000</td>
</tr>
<tr>
<td>Lombard Aorfix Surveillance Project</td>
<td>EVAR</td>
<td>No</td>
<td>234 pts 50 sites</td>
<td>30 day 1, 2, 3, 4, 5 yr</td>
<td>$4000</td>
</tr>
</tbody>
</table>

*Expect enrollment to re-open in late 2018

For more information, contact PATHWAYSsupport@m2s.com
Who attended?

Feedback?
VQI@VAM Highlights:

- **Introduction to the New Member Guide**
  By: Nancy Heatley, Education and Research Projects Manager

- **Tools and Resources of the Vascular Quality Initiative**
  By: Cheryl Jackson, Director of Quality

Links to the new Member Guide and the new QI Project Guide Supplement can be found on the Members Only section of the VQI website in the National Section:

https://www.vqi.org/national-data/
Tools and Resources of the Vascular Quality Initiative
Accessing VQI on the Web

- Reports - Share-a-File

- VQI website [https://www.vqi.org/](https://www.vqi.org/)


- Data definitions - : [https://www.vqi.org/national-data/dashboards/](https://www.vqi.org/national-data/dashboards/)
Data – Now What

- Open your reports
- Analyze your data
- Use your data
- We all have areas of improvement
- Don’t be afraid

Putting Data into Action
VQI RESOURCES
Use your VQI reports
- Bi-annual reports (Spring and Fall)
- Dashboards
  • Physician level
  • Center level
- Center Opportunity Profile for Improvement (COPI) reports
  • Center level
  • Physician level
- National QI reports
- D/C medications
- EVAR LTFU Imaging
- Analytics engine reports
- SVS guidelines and recommendations
VQI Resources

- Analyze your data
  - QI Project Guide
    - Original – released in 2016
    - National Quality Initiatives Supplement
  - Tools
    - Case studies
    - Charters
    - PDCA/PDSA
    - DMAIC
Webinars

February 2018
- “Starting a QI project”
  - PDCA/PDSA

May 2018
- EVAR LTFU Imaging
- How to sustain progress
- DMAIC

September 2018
- Case study from an audit
- Failure modes and effects analysis (FMEA)

November 2018
- Wrapping up a QI project, 2019 Participation Award information
## Fifty five charters

<table>
<thead>
<tr>
<th>Topics</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge Medications (National Initiative)</td>
<td>20</td>
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<tr>
<td>LTFU (including EVAR Imaging a National Initiative), IVCF Retrieval</td>
<td>8</td>
</tr>
<tr>
<td>LOS (CEA and EVAR)</td>
<td>11</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>Clinical: Blood Transfusion, AAA Processes, Limb Salvage, SSI</td>
<td>6</td>
</tr>
</tbody>
</table>
Charters

- Focused group calls
  - Interactive discussion sharing barriers and successes
  - Sharing of charters
  - Networking
  - Checking in – where are you in the process
  - Celebrating success
Newsletters

- The VQI News
  - Distributed every other month
  - Provides updates on regulatory issues, technical updates, and crossover news from the SVS

- VQI Quality Improvement Newsletter
  - Distributed every other month
  - Focusing on QI processes, tools, and definitions
Members Only Website

- Protected area on the VQI website
- Registry forums
  - All registries listed
  - QI forum
Next Steps

- Where are you?
- Wrapping up a QI project
- Sharing outcomes
  - Internally
  - Externally
How to increase regional meeting attendance and participation?

- Lead physicians agreed to personally call centers that do not regularly attend
- Created a script of standardized questions (willing to share with other regions)
- Plan to publish results
Winner of the Poster Competition:

"Implementation of a Structured Protocol to Improve Rates of VQI Registry Vascular Patient Follow Up" from NY Presbyterian - Weill Cornell Medicine

Authors: Melissa R. Katzman, PA-C, Katherine E. Greger, PA-C, Ashley Graham, BS, Andrew J. Meltzer, MD, and Darren B. Schneider, MD
Research Advisory Council Update
Wayne Zhang, MD
Change in RAC Policy!

Dropping the need to avoid overlap as a criteria for SVS PSO RAC approval.

- Research protocols now need only to demonstrate feasibility that the research can be accomplished using data available in the VQI dataset.

- Overlap with an existing project will not be used as grounds for rejection of a research protocol application.

- The Recipient agrees to present or publish approved project within 24 months. The SVS PSO RAC reserves the right to ask Recipient to return the dataset if no progress is demonstrated according to these guidelines.
Check Approved Project List:

https://www.vqi.org/vqi-resource-library/quality-research/rac-approved-project-search/

To submit a proposal to be considered for the National RAC, please follow the link below:
http://abstracts123.com/svs1/meetinglogin
National Research Process

Medicare Matched Datasets:

https://www.vqi.org/vqi-resource-library/quality-research/blinded-datasets/

VQI Medicare Matched Blinded Datasets

Please review the Overview, Datasets and Flowcharts on this page before you start a National RAC project submission to ensure that the data will be suitable for Medicare-matching as the process has changed.

As the Medicare individual level data are subject to Data Use Agreements (DUAs) with the Centers for Medicare and Medicaid Services (CMS), no individual level data can be shared, but TDI will share CMS data that meets aggregated data release guidelines outlined in our DUA. While prior user agreements suggested that blinded datasets could be disseminated, the new DUA requires that no patient-level data be shared.

Overview for Use of VQI-Medicare Matched Datasets

Dataset Profiles

- Dataset Profile CAS 3.19.18
- Dataset Profile CEA 3.19.18
- Dataset Profile EVAR 3.19.18
- Dataset Profile HEMO 3.19.18
- Dataset Profile INFRA 3.19.18
- Dataset Profile OPEN 3.19.18
- Dataset Profile PVI 3.19.18
- Dataset Profile SUPRA 3.19.18
- Dataset Profile TEVAR 3.19.18
Proposal Submissions

**December 2018**
- Call for Proposals: October 9, 2018
- Due Date: November 19, 2018
- Meeting: December 10, 2018
- Notification Sent: December 11, 2018

**February 2019**
- Call for Proposals: December 11, 2018
- Due Date: January 28, 2019
- Meeting: February 11, 2019
- Notification Sent: February 12, 2019
Arterial Quality Council Update: Nam Tran, MD
Finalizing Common Variable select options and helpertext amongst registries where applicable

Completing all “missing helpertext”

Clinically reviewing all helpertext to site scientific support where applicable

LTFU **required** fields are complete and M2S is in the process of development for 2018 release
Physician and Center Dashboards: Physician and center stats on critical outcomes by registry over the past year, including regional and VQI benchmarks. First physician reports delivered in February and will be updated in fall. Center-level dashboards planned for June.

Comparative COPI Reports: We will update prior COPI reports with new data to check centers’ improvement. EVAR LOS planned for May, INFRA LOS for August and INFRA SSI in September.

National QI Initiative Updates: Reports will be issued quarterly starting in March tracking centers’ progress on Discharge Medications and Follow-Up Imaging After EVAR.
Venous Quality Council Update
Timothy Liem, MD
First Bi-Annual Varicose Vein Meeting at VAM!!!

Plan to meet at AVF every year and hold a conference call every Fall
(October 29, 2018 10am -12:00pm ET)
Significant participation in first 3 years
- 130 Physicians entering consecutive VV cases

41 Varicose Vein Centers

>20,000 Varicose Vein Procedures
VVR Participation:

- Total Procedures entered: 20,536
- Entered by 36 sites in 20 states
Effects of age, gender, race and other patient factors on outcome of GSV ablation

Incidence and impact of EHIT after GSV ablation

Clinical and patient reported outcomes after different types of GSV ablation

Impact of truncal vein diameter on ablation outcomes

Factors associated with need for repeat treatment after GSV ablation

Increased opportunity with increasing data

Research drives Quality Improvement!!!
874 total perforator treatments reported, 332 (38%) for C2 disease
332 veins were treated as part of 279 total procedures
279 procedures, 124 (44%) were performed at one center
2 other centers have 30 such procedures each
The remaining 95 such procedures are scattered across 20 other centers
Venous Stent Registry: release 2018

Clinical Workgroup:
Marc Passman, MD (chair), William Marston MD, Tony Gasparis MD, Rabith Chaer MD, BK Lal MD, Lowell Kabnick MD

Industry and FDA Collaboration:
Bard, Boston Scientific, Cook, Gore, Medtronic, Veniti
Governing Council Update
Stephen Murray, MD
Addition of members from the Society for Vascular Ultrasound

- Dr. David Dawson; SVU Physician Director
- Kelly Byrnes, BS, RTV, FSVU; NortonHealthcare; SVU Treasurer

Vote on new Executive Committee Members

- Dr. Leila Mureebe, Duke
- Dr. Randy DeMartino, Mayo
SVS Guidelines & VQI

SVS Guidelines

- Are they being followed?
- Are they adopted over time?
- Do they influence outcomes?
- Can VQI help answer these questions?
SVS Guidelines & VQI

- AAA Guidelines published in January JVS
- 119 recommendations/suggestions
- 15 guidelines potentially measurable in VQI

Compliance with guideline
  - Quit smoking > 2 weeks before OAAA – 44%
  - EVAR size threshold – 58%
  - Preservation of IIA during EVAR – 98%
Preop Stress Test

Size guideline for AAA repair

OAAA: Compliance with Stress Testing Guideline by Center

EVAR: Compliance with AAA Diameter Guideline by Center
Using Cell Saver by Center

OAAA: Compliance with Cell Salvage Guideline by Center

% Procedures Meeting Guideline

Centers (centers with <10 cases omitted)
Adherence to use of cell saver had decreased inpatient and one year mortality following open AAA repair.

Guideline compliance improves outcomes.
Next Steps:

- Consideration of creation of center level reports for OAAA in Spring of 2019
- Dr. Forbes authoring a manuscript on initial findings
- VQI using the Guidelines to inform registry variables
- Potential to expand this exercise to other procedures
Notes:
1) In all reports, regional data are not shown for regions with <3 centers participating in the applicable registry.
2) In “by Center” bar charts, unless noted, data are not shown for centers with <10 cases.
3) In all graphics, “*” indicates a p-value<.05.
4) This report includes all data that had been entered into the VQI as of June 30, 2018.
Dashboard

The table below summarizes your center’s results as presented in each of the subsequent reports and provides regional and national benchmarks for comparison. In the “Your Center” column, percentages represent the rate of cases with the noted outcome. Numbers in parentheses are the number of cases with the outcome/the total number of cases meeting the exclusion criteria (see the full report for details). In the “Region” and “VQI” columns, the numbers represent the 25th, 50th (median) and 75th percentiles for centers in your region and across all centers in the VQI.

Your center’s results are highlighted in green if your center is at or above the top 25th percentile nationally, in yellow if your center is among the middle 50% of centers, and in red if at or below the bottom 25th percentile.
## Dashboard

Legend: **Green** = At or above 75th percentile  **Yellow** = Middle 50%  **Red** = At or below 25th percentile

| Registry                | Outcome                        | Your Center % (n/N) | Your Region [25p|50p|75p] | VQI Overall [25p|50p|75p] |
|-------------------------|--------------------------------|---------------------|-----------------------------|-----------------------------|
| All                     | Total Procedure Volume         |                     | [35 | 70 | 96]                   | [37 | 134 | 330]                   |
| Multiple (July 2015-June 2016) | Long-Term Follow-Up            | [10% | 71% | 90%]            | [44% | 72% | 86%]            |
| Multiple                | Discharge Medications          | [75% | 83% | 95%]            | [75% | 83% | 90%]            |
| AVACCESS                | Primary AVF vs. Graft          | NA (<3 centers)     | [74% | 85% | 90%]            |
| CAS                     | In-Hospital Stroke/Death       | [3% | 0% | 0%]             | [3% | 0% | 0%]             |
| CEA                     | In-Hospital Stroke/Death       | [0% | 0% | 0%]             | [1% | 0% | 0%]             |
| CEA                     | LOS>1 Day                      | [25% | 21% | 9%]             | [33% | 22% | 14%]             |
| EVAR                    | LOS>2 Days                     | [14% | 8% | 1%]             | [18% | 11% | 3%]             |
| EVAR (July 2015-June 2016) | Sac Diameter at LTFU          | [14% | 59% | 696%]           | [36% | 56% | 72%]           |
| INFRA                   | Chlorhexidine Skin Prep        | [96% | 100% | 100%]          | [86% | 98% | 100%]          |
| INFRA                   | Major Complications            | [8% | 6% | 2%]             | [6% | 0% | 0%]             |
| IVCF (2017)             | Filter Retrieval               | NA (<3 centers)     | [1% | 27% | 45%]             |
| LEAMP                   | Postop Complications           | NA (<3 centers)     | [24% | 17% | 10%]             |
| OAAA                    | In-Hospital Mortality          | [0% | 0% | 0%]             | [2% | 0% | 0%]             |
| PVI                     | Ultrasound Guidance            | [93% | 96% | 98%]            | [74% | 93% | 98%]            |
| PVI                     | ABI/TBI Reported               | [70% | 73% | 78%]            | [65% | 81% | 92%]            |
| SUPRA                   | Postop Complications           | NA (<3 centers)     | [33% | 23% | 11%]            |
| TEVAR (July 2015-June 2016) | Sac Diameter at LTFU          | [7% | 14% | 21%]             | [25% | 43% | 56%]             |
| VV (2017)               | PROMs at LTFU                  | NA (<3 centers)     | [38% | 97% | 100%]            |
Total Procedure Volume, All Years (2003-May 2018) entered by June 30, 2018

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Your Center (N)</th>
<th>Your Region (N)</th>
<th>VQI Overall (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVACCESS</td>
<td>NA (&lt;3 centers)</td>
<td></td>
<td>38995</td>
</tr>
<tr>
<td>CAS</td>
<td>811</td>
<td></td>
<td>21741</td>
</tr>
<tr>
<td>CEA</td>
<td>2717</td>
<td></td>
<td>101836</td>
</tr>
<tr>
<td>EVAR</td>
<td>1240</td>
<td></td>
<td>40276</td>
</tr>
<tr>
<td>INFRA</td>
<td>829</td>
<td></td>
<td>44904</td>
</tr>
<tr>
<td>IVCF</td>
<td>NA (&lt;3 centers)</td>
<td></td>
<td>9888</td>
</tr>
<tr>
<td>LEAMP</td>
<td>NA (&lt;3 centers)</td>
<td></td>
<td>10989</td>
</tr>
<tr>
<td>OAAA</td>
<td>265</td>
<td></td>
<td>10774</td>
</tr>
<tr>
<td>PVI</td>
<td>2929</td>
<td></td>
<td>149590</td>
</tr>
<tr>
<td>SUPRA</td>
<td>NA (&lt;3 centers)</td>
<td></td>
<td>14860</td>
</tr>
<tr>
<td>TEVAR</td>
<td>352</td>
<td></td>
<td>10904</td>
</tr>
<tr>
<td>Varicose Veins</td>
<td>NA (&lt;3 centers)</td>
<td></td>
<td>21136</td>
</tr>
<tr>
<td>Overall</td>
<td>10384</td>
<td></td>
<td>475893</td>
</tr>
</tbody>
</table>
"Others" indicates centers that do not belong to a regional group.
Physician Specialties by Region

Physician Specialties Across VQI (as of May 31, 2018, N=3776 Physicians)
Physician Specialties Across Your Region (as of May 31, 2018, N=150 Physicians)
### Percentage of Procedures With 9 Months or Greater Follow-Up

Procedures performed between July 1, 2015 and June 30, 2016

Data for this report include all cases with surgery date between July 1, 2015 and June 30, 2016, that had been entered into the VQI as of June 30, 2018.

<table>
<thead>
<tr>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVACCESS</td>
<td>NA (&lt;3 centers)</td>
<td>6740 (70%)</td>
</tr>
<tr>
<td>CAS</td>
<td>88 (74%)</td>
<td>3301 (64%)</td>
</tr>
<tr>
<td>CEA</td>
<td>495 (74%)</td>
<td>15935 (70%)</td>
</tr>
<tr>
<td>EVAR</td>
<td>229 (73%)</td>
<td>6345 (74%)</td>
</tr>
<tr>
<td>INFRA</td>
<td>NA (&lt;3 centers)</td>
<td>6504 (75%)</td>
</tr>
<tr>
<td>IVCF</td>
<td>NA (&lt;3 centers)</td>
<td>2086 (69%)</td>
</tr>
<tr>
<td>LEAMP</td>
<td>NA (&lt;3 centers)</td>
<td>2051 (74%)</td>
</tr>
<tr>
<td>OAAA</td>
<td>44 (43%)</td>
<td>1244 (73%)</td>
</tr>
<tr>
<td>PVI</td>
<td>NA (&lt;3 centers)</td>
<td>23511 (71%)</td>
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<tr>
<td>SUPRA</td>
<td>NA (&lt;3 centers)</td>
<td>2227 (72%)</td>
</tr>
<tr>
<td>TEVAR</td>
<td>98 (54%)</td>
<td>1976 (69%)</td>
</tr>
<tr>
<td>Overall (July 2015-June 2016)</td>
<td></td>
<td>1588 (74%)</td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td>1156 (76%)</td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td>1757 (53%)</td>
</tr>
</tbody>
</table>
Long-Term Follow-Up by Center in Your Region (July 2015-June 2016)

- Other centers in your region
- Your center

Centers (centers with <10 cases not shown)

** indicates center’s rate differs significantly from the regional rate.

Long-Term Follow-Up by Region Across VQI (July 2015-June 2016)

- New York*
- Southeast*
- Others
- Virginias*
- New England*
- So. Cal.*
- Nor. Cal.*
- SOVONET*
- VQI
- Midwest
- Rocky Mtns.
- Pacific NW*
- Carolinas*
- MidSouth*
- Mid-Atlantic
- G. Lakes
- Michigan
- Mid-America*
- Up. Midwest*

“Others” indicates centers that do not belong to a regional group. ** indicates region’s rate differs significantly from the VQI rate.
Discharge Medications Procedures performed between Procedures performed between June 1, 2017 and May 31, 2018 entered by June 30, 2018

Excludes patients who died in hospital and patients who were not treated for medical reason or non-compliant. “Antiplatelet” is defined as ASA or P2Y12 inhibitor

<table>
<thead>
<tr>
<th>Number of Procedures at Your Center</th>
<th>Antiplatelet+Statin</th>
<th>Antiplatelet Only</th>
<th>Statin Only</th>
<th>Neither</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your Region</td>
<td>2158</td>
<td>79%</td>
<td>13%</td>
<td>5%</td>
</tr>
<tr>
<td>VQI overall</td>
<td>69404</td>
<td>81%</td>
<td>12%</td>
<td>4%</td>
</tr>
</tbody>
</table>
Discharge Antiplatelet+Statin Rate by Center in Your Region (June 2017-May 2018)

Other centers in your region  Your center

Centers (centers with <10 cases not shown)

"***" indicates center's rate differs significantly from the regional rate.

Discharge Antiplatelet+Statin Rate by Region Across VQI (June 2017-May 2018)


"Others" indicates centers that do not belong to a regional group. "***" indicates region's rate differs significantly from the VQI rate.
Carotid Artery Stent: Stroke or Death in Hospital Procedures performed between June 1, 2017 and May 31, 2018

Elective procedures, excluding prior ipsilateral CAS, and dissection, trauma and “other” lesion types. The table below shows the number of CAS procedures meeting the inclusion criteria that were in the VQI as of June 30, 2018, and the observed and expected rates of in-hospital stroke or death for those cases.

<table>
<thead>
<tr>
<th></th>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of CAS procedures meeting inclusion criteria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observed rate of stroke or death among procedures meeting inclusion criteria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of procedures with complete data*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observed rate of stroke or death among cases with complete data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected rate of stroke or death among cases with complete data*</td>
<td></td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>P-value for comparison of observed and expected rates</td>
<td></td>
<td></td>
<td>NA</td>
</tr>
</tbody>
</table>

*“Expected rate” is the rate estimated by a statistical model that accounts for patient characteristics, including age, gender, race, BMI, comorbidities, medication and stroke and vascular history. “Cases with complete data” include patients who have data on all of those factors.
A2 (why NA for VQI?): There is no expected rate for all VQI. Hence the “VQI overall” expected rate is always NA.

- In general, “expected rate” means “rate we expect in a particular subset of the data, given the rate we observe across the whole dataset.”
- “VQI Overall” is the whole dataset. Since it’s not a subset of any larger dataset, there can be no “expected rate.”

<table>
<thead>
<tr>
<th></th>
<th>Your center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of CEA procedures meeting inclusion criteria</td>
<td>111</td>
<td>1140</td>
<td>12564</td>
</tr>
<tr>
<td>Observed rate of LOS&gt;1 day among procedures meeting inclusion criteria</td>
<td>7%</td>
<td>28%</td>
<td>25%</td>
</tr>
<tr>
<td>Number of procedures with complete data*</td>
<td>100</td>
<td>1091</td>
<td>12037</td>
</tr>
<tr>
<td>Observed rate of LOS&gt;1 among cases with complete data</td>
<td>6%</td>
<td>28%</td>
<td>24%</td>
</tr>
<tr>
<td>Expected rate of LOS&gt;1 among cases with complete data*</td>
<td>23%</td>
<td>23%</td>
<td>NA</td>
</tr>
<tr>
<td>P-value for comparison of observed and expected rates</td>
<td>0</td>
<td>0</td>
<td>NA</td>
</tr>
</tbody>
</table>

*“Expected rate” is the rate estimated by a statistical model that accounts for patient characteristics, including age, gender, race, BMI, comorbidities, medication and stroke and vascular history. “Cases with complete data” include patients who have data on all of those factors.
Rate of In-Hospital Stroke or Death After CAS by Year

- Your Center
- Your Region
- VQI Overall
Rate of In-Hospital Stroke or Death After CAS in Your Region (June 2017-May 2018)

Centers (centers with <10 cases not shown)

"***" indicates center's observed rate differs significantly from its expected rate.

Rate of In-Hospital Stroke or Death After CAS by Region Across VQI (June 2017-May 2018)

"Others" indicates centers that do not belong to a regional group. "***" indicates region's observed rate differs significantly from its expected rate.
Carotid Endarterectomy: Stroke or Death in Hospital Procedures performed between June 1, 2017 and May 31, 2018
Elective procedures, excluding prior ipsilateral CEA and concomitant CABG, endovascular or other arterial procedure
Data for this report include all cases with surgery date between June 1, 2017 and May 31, 2018, that had been entered into the VQI as of June 30, 2018. The table below shows the number of CEA procedures meeting the inclusion criteria in the VQI, and the observed and expected rates of in-hospital stroke or death for those cases.

<table>
<thead>
<tr>
<th></th>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of CEA procedures meeting inclusion criteria</td>
<td>611</td>
<td>13860</td>
<td></td>
</tr>
<tr>
<td>Observed rate of stroke or death among procedures meeting inclusion criteria</td>
<td>1.1%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Number of procedures with complete data*</td>
<td>587</td>
<td>13147</td>
<td></td>
</tr>
<tr>
<td>Observed rate of stroke or death among cases with complete data</td>
<td>1.2%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Expected rate of stroke or death among cases with complete data*</td>
<td>1.1%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>P-value for comparison of observed and expected rates</td>
<td>0.84</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

*“Expected rate” is the rate estimated by a statistical model that accounts for patient characteristics, including age, gender, race, BMI, comorbidities, medication and stroke and vascular history. “Cases with complete data” include patients who have data on all of those factors.
Rate of In-Hospital Stroke or Death After CEA by Year

- June 2014-May 2015
- June 2015-May 2016
- June 2016-May 2017
- June 2017-May 2018

- Your Center
- Your Region
- VQI Overall
Rate of In-Hospital Stroke or Death After CEA in Your Region (June 2017-May 2018)

- **Other centers in your region**
- **Your center**
- **Observed**
- **Expected**

Centers (centers with <10 cases not shown)

"**" indicates center's observed rate differs significantly from its expected rate.

Rate of In-Hospital Stroke or Death After CEA by Region Across VQI (June 2017-May 2018)

- **Observed**
- **Expected**

"Others" indicates centers that do not belong to a regional group. "**" indicates region's observed rate differs significantly from its expected rate.
Carotid Endarterectomy: Percentage of Patients with LOS>1 Day
Procedures performed between June 1, 2017 and May 31, 2018

Elective procedures, excluding prior ipsilateral CEA, concomitant CABG, proximal endovascular or other arterial operation, in-hospital death with LOS<=1 day, procedures done on weekends or not done on admission day.

Data for this report include all cases with surgery date between June 1, 2017 and May 31, 2018, that had been entered into the VQI as of June 30, 2018. The table below shows the number of CEA procedures meeting inclusion criteria in the VQI, and the observed and expected rates of those cases with LOS>1 Day.

<table>
<thead>
<tr>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of CEA procedures meeting inclusion criteria</td>
<td>566</td>
<td>12452</td>
</tr>
<tr>
<td>Observed rate of LOS&gt;1 day among procedures meeting inclusion criteria</td>
<td>21%</td>
<td>24%</td>
</tr>
<tr>
<td>Number of procedures with complete data*</td>
<td>546</td>
<td>11954</td>
</tr>
<tr>
<td>Observed rate of LOS&gt;1 among cases with complete data</td>
<td>21%</td>
<td>24%</td>
</tr>
<tr>
<td>Expected rate of LOS&gt;1 among cases with complete data*</td>
<td>24%</td>
<td>NA</td>
</tr>
<tr>
<td>P-value for comparison of observed and expected rates</td>
<td>0.1</td>
<td>NA</td>
</tr>
</tbody>
</table>

*“Expected rate” is the rate estimated by a statistical model that accounts for patient characteristics, including age, gender, race, BMI, comorbidities, medication and stroke and vascular history. “Cases with complete data” include patients who have data on all of those factors.
Rate of CEA Patients With LOS>1 Day in Your Region (June 2017-May 2018)

** indicates center’s observed rate differs significantly from its expected rate.

Rate of CEA Patients With LOS>1 Day by Region Across VQI (June 2017-May 2018)

"Others" indicates centers that do not belong to a regional group. **"** indicates region’s observed rate differs significantly from its expected rate.
Endovascular AAA Repair: Percentage of Patients with LOS>2 Days

Procedures performed between June 1, 2017 and May 31, 2018
Excludes ruptured aneurysms and in-hospital deaths with LOS<=2 days, patients with prior aortic surgery, procedures not done on day of admission and weekend procedures
Data for this report include all cases with surgery date between June 1, 2017 and May 31, 2018, that had been entered into the VQI as of June 30, 2018. The table below shows the number of EVAR procedures meeting the inclusion criteria and the observed and expected rates of those cases with LOS>2 Days.

<table>
<thead>
<tr>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of EVAR procedures meeting inclusion criteria</td>
<td>278</td>
<td>5207</td>
</tr>
<tr>
<td>Observed rate of LOS&gt;2 days among procedures meeting inclusion criteria</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Number of procedures with complete data*</td>
<td>263</td>
<td>4936</td>
</tr>
<tr>
<td>Observed rate of LOS&gt;2 among cases with complete data</td>
<td>12%</td>
<td>13%</td>
</tr>
<tr>
<td>Expected rate of LOS&gt;2 among cases with complete data*</td>
<td>13%</td>
<td>NA</td>
</tr>
<tr>
<td>P-value for comparison of observed and expected rates</td>
<td>0.58</td>
<td>NA</td>
</tr>
</tbody>
</table>

*“Expected rate” is the rate estimated by a statistical model that accounts for patient characteristics, including age, gender, race, BMI, comorbidities, medication and stroke and vascular history. “Cases with complete data” include patients who have data on all of those factors.
Rate of EVAR Patients With LOS>2 Days by Year

- Your Center
- Your Region
- VQI Overall

June 2014-May 2015
June 2015-May 2016
June 2016-May 2017
June 2017-May 2018
Rate of EVAR Patients With LOS>2 Days in Your Region (June 2017-May 2018)

Centers (centers with <10 cases not shown)

*** indicates center’s observed rate differs significantly from its expected rate.

Rate of EVAR Patients With LOS>2 Days by Region Across VQI (June 2017-May 2018)

“Others” indicates centers that do not belong to a regional group. *** indicates region’s observed rate differs significantly from its expected rate.
EVAR: Rate of Sac Diameter Reporting at Long-Term Follow-Up

Procedures performed between July 1, 2015 and June 30, 2016
Data for this report include all cases with surgery date between July 1, 2015 and June 30, 2016, that had been entered into the VQI as of June 30, 2018. The table below shows the number of EVAR procedures in the VQI, and the percentage of those cases in which the patient had a follow-up visit between 9 and 21 months post-surgery at which a sac diameter was recorded.

<table>
<thead>
<tr>
<th></th>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of EVAR procedures</td>
<td></td>
<td>229</td>
<td>6345</td>
</tr>
<tr>
<td>Percentage with sac diameter recorded at follow-up</td>
<td>53%</td>
<td>55%</td>
<td></td>
</tr>
</tbody>
</table>
Rate of LTFU Sac Diameter Reporting by Year

Your Center: [Line color and style]
Your Region: [Line color and style]
VQI Overall: [Line color and style]
Rate of LTFU Sac Dimaeter Reporting in Your Region (July 2015-June 2016)

Other centers in your region  Your center

Centers (centers with <10 cases not shown)

*** indicates center’s rate differs significantly from the regional rate.

Rate of LTFU Sac Diameter Reporting by Region Across VQI (July 2015-June 2016)

Others” indicates centers that do not belong to a regional group. “***” indicates region’s rate differs significantly from the VQI rate.
In VQI patients, chlorhexidine and chlorhexidine+alcohol skin preps have been shown to reduce the surgical-site infection rate by 50% compared to iodine-based skin prep. Chlorhexidine+iodine and chlorhexidine+iodine+alcohol skin preps have not been shown to reduce the infection rate, but rates of their use are also reported in the table below. Data for this report include all cases with surgery date between June 1, 2017 and May 31, 2018, that had been entered into the VQI as of June 30, 2018.
Percentage With Chlorhexidine or Chlorhexidine+Alcohol Skin Prep by Year


Your Center | Your Region | VQI Overall
Percentage With Chlorhexidine or Chlorhexidine+Alcohol Skin Prep in Your Region (June 2017-May 2018)

- Other centers in your region
- Your center

Centers (centers with <10 cases not shown)

*** indicates center’s rate differs significantly from the regional rate.

Percentage With Chlorhexidine or Chlorhexidine+Alcohol Skin Prep by Region (June 2017-May 2018)

- Canada*
- MidSouth*
- G. Lakes*
- So. Cal.*
- Carolinas*
- Mid-Atlantic*
- Southeast*
- Rocky Mtns.*
- VQL
- Mid-America
- Up.
- Midwest
- New England*
- Virgini*
- New York*
- SOVENET*
- Michigan*
- Pacific NW*
- Midwest*
- Nor. Cal.*

“Others” indicates centers that do not belong to a regional group. “***” indicates region’s rate differs significantly from the VQL rate.
Infrainguinal Bypass: Rate of Major Complications

Procedures performed between June 1, 2017 and May 31, 2018
Includes only patients with indication of rest pain or tissue loss. Major complications are defined as in-hospital death, ipsilateral BK or AK amputation or graft occlusion.

Data for this report include all cases with surgery date between June 1, 2017 and May 31, 2018, that had been entered into the VQI as of June 30, 2018. The table below shows the number of INFRA cases with indication of rest pain or tissue loss in the VQI, and the percentage of those cases that resulted in in-hospital death, ipsilateral amputation or graft occlusion.

<table>
<thead>
<tr>
<th></th>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of INFRA procedures meeting inclusion criteria</td>
<td>183</td>
<td>4008</td>
<td></td>
</tr>
<tr>
<td>Percentage with major complications after INFRA</td>
<td>2.7%</td>
<td>4.2%</td>
<td></td>
</tr>
</tbody>
</table>
Rate of Major Complications After INFRA in Your Region (June 2017-May 2018)

- Other centers in your region
- Your center

Centers (centers with <10 cases not shown)

"***" indicates center's rate differs significantly from the regional rate.

Rate of Major Complications After INFRA by Region Across VQI (June 2017-May 2018)

"Others" indicates centers that do not belong to a regional group. "***" indicates region's rate differs significantly from the VQI rate.
PVI: Percentage of Percutaneous Femoral Access Sites Using Ultrasound Guidance

Procedures performed between June 1, 2017 and May 31, 2018
Excludes cut-down access guidance

Data for this report include all cases with surgery date between June 1, 2017 and May 31, 2018, that had been entered into the VQI as of June 30, 2018. The table below shows the number of percutaneous femoral PVI access sites in the VQI, the percentage of those cases in which ultrasound access guidance was used, the percentage in which a closure device was used, and the rate of hematoma.

<table>
<thead>
<tr>
<th></th>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of percutaneous femoral access sites</td>
<td>389</td>
<td>23903</td>
<td></td>
</tr>
<tr>
<td>Rate of ultrasound access guidance</td>
<td>93%</td>
<td>77%</td>
<td></td>
</tr>
<tr>
<td>Rate of closure device usage</td>
<td>70%</td>
<td>68%</td>
<td></td>
</tr>
<tr>
<td>Rate of any hematoma (minor, moderate or major)</td>
<td>1.8%</td>
<td>2.1%</td>
<td></td>
</tr>
<tr>
<td>Rate of moderate or major hematoma</td>
<td>0.8%</td>
<td>0.6%</td>
<td></td>
</tr>
</tbody>
</table>
Rate of Ultrasound Access Guidance in Your Region (June 2017-May 2018)

- Other centers in your region
- Your center

Centers (centers with <10 cases not shown)

“***” indicates center’s rate differs significantly from the regional rate.

Rate of Ultrasound Access Guidance by Region Across VQI (June 2017-May 2018)

- Mid-America*
- G. Lakes*
- Midwest*
- Southeast*
- Up. Midwest*
- VQI
- Michigan*
- So. Cal.*
- Carolinas*
- Mid-Atlantic*
- Virginias*
- New England*
- New York*
- Rocky Mtns.*
- Pacific NW
- MidSouth*
- Canada*
- Nor. Cal.*
- SOVONET*

“Others” indicates centers that do not belong to a regional group. “***” indicates region’s rate differs significantly from the VQI rate.
PVI: Percentage of Claudicants With ABI or Toe Pressure Reported Before Procedure

Procedures performed between June 1, 2017 and May 31, 2018

“ABI or toe pressure reported” indicates at least one measure was recorded for the side of the operation, or on both sides for bilateral and aortic procedures.

Data for this report include all cases with surgery date between June 1, 2017 and May 31, 2018, that had been entered into the VQI as of June 30, 2018. The table below shows the number of PVI procedures with indication of claudication in the VQI, and the percentage of those cases in which ABI or toe pressure was recorded.

<table>
<thead>
<tr>
<th></th>
<th>Your Center</th>
<th>Your Region</th>
<th>VQI Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of PVI procedures with indication of claudication</td>
<td>198</td>
<td>11807</td>
<td></td>
</tr>
<tr>
<td>Percentage with ABI/TBI recorded before procedure</td>
<td>76%</td>
<td>77%</td>
<td></td>
</tr>
</tbody>
</table>
Rate of ABI/TBI Assessment Before PVI by Region Across VQI (June 2017-May 2018)

“Others” indicates centers that do not belong to a regional group. “*” indicates region’s rate differs significantly from the VQI rate.
Varicose Veins: Percentage of Procedures With Complete Patient-Reported Outcome Measures Recorded at Follow-Up

Includes only patients with any follow-up visit recorded.

All regional data omitted because most regions have <3 centers.

Patient-reported outcomes measures (PROMs) include heaviness, achiness, swelling, throbbing, itching, appearance and impact on work in side of operation.

**PROMs by Center Across VQI (Jan-Dec 2017)**

"***" indicates center's rate differs significantly from the overall VQI rate.
Presentations

- Alejandro Perez, MD
- Ben Starnes, MD/Amanda Sigala, RN
Providence Health & Services - Oregon Experience with VQI

Alejandro Perez, MD, FSVM, PRVI
Vascular Medicine
Background

• Previous vascular quality data prior to Vascular Quality Initiative (VQI) was hospital based and not referenced to national standards
Vascular practitioners

- Interventional Cardiology
- Interventional Radiology
- General Surgery
- Neurosurgery
- Vascular Medicine
- Vascular Surgery
Providence system agreed to participate in 4 VQI modules beginning Q4 2015:
• CAS
• CEA
• Endovascular AAA Repair
• Open AAA Repair
Later modules added:
- Infrainguinal bypass
- TCAR as part of carotid data
How VQI used?

• Providence system Oregon quality reporting for vascular as part of multi-discipline Quality Council
• Component of Vascular M&M to demonstrate adherence to medical management strategies and reporting of complications/outcomes
What have we learned

Reporting data affects behavior

Examples:

• Compliance with medical management strategies have improved over last 2 years

• System level reporting and protocols are being externalized from what has been learned at Oregon level

• Surgery practice has rapid feedback to outcomes and has affected planned treatments
What we have learned

• Surgical practice has variability that is hospital based
Next steps

• Research projects using VQI data
• Further work to improve quality
HARBORVIEW MEDICAL CENTER
TEVAR, MODIFIED & CUSTOM
GRAFTS (ZFEN)
METRICS & BENCHMARKS

VQI PNW REGIONAL GROUP MEETING
11/01/2018

BENJAMIN STARNES, MD, FACS
AMANDA SIGALA, BSN, MPH, CPHQ
Thoracic/Complex EVAR module in VQI Pathways for patients with TEVAR, or with Complex EVAR with physician-modified grafts or Complex EVAR with custom grafts.

Procedure dates Q42014 to Q32018.

- EBL (mL)
- Flouro Time (mins)
- Contrast Usage (mL)
- Percutaneous Femoral Access
- Total Procedure Time (mins)
- Re-intervention (related)
- Any Post-Op Complication
- Length of Stay (days)
- Not Discharged Home
• ZFEN: HMC n=58, (only 7 procedures in other sites in PMW regional group, unable to benchmark if n<10) VQI national n=1274
• Modified grafts: PNW Regional Group n=92 (78 HMC, 14 other PNW), VQI National n=326
• TEVAR = all other procedures who did not have a custom or modified graft: PNW Regional Group n=230 (152 HMC, 78 Other), VQI National n=6,490
• Total procedure time = From incision or initial sheath placement until closure or sheath removal. Do not include total anesthesia time.
• Post-Op Complications as defined by VQI include: Access Site Occlusion, Arm Ischemia/Emboli, CHF, Cerebrovascular Sx, Dialysis, Dysrhythmia, Intestinal Ischemia, Leg Compartment Syndrome, Leg Ischemia/Emboli, MI, Renal Ischemia, Respiratory, Spinal Ischemia, Surgical Site Infection.
• Not discharged home = Discharged to a higher level of care than pre-op level of care.
• Re-intervention (related) = intervention related to index procedure during index admission
**USER CALCULATED VARIABLE**
**FOR CUSTOM OR MODIFIED GRAFTS**

### Calculated Variable:

- **Variable Name**: Modified Graft
- **Variable Description**: Descriptive text (optional)
- **Calculated Variable For**: Thoracic and Complex EVAR
- **Variable Type**: Categorical

### Formula

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graft Type D1 is equal to Physician modified</td>
<td>= (is equal to)</td>
<td></td>
</tr>
<tr>
<td>Graft Type D2 is equal to Physician modified</td>
<td>= (is equal to)</td>
<td></td>
</tr>
<tr>
<td>Graft Type D3 is equal to Physician modified</td>
<td>= (is equal to)</td>
<td></td>
</tr>
<tr>
<td>Graft Type D4 is equal to Physician modified</td>
<td>= (is equal to)</td>
<td></td>
</tr>
<tr>
<td>Graft Type D5 is equal to Physician modified</td>
<td>= (is equal to)</td>
<td></td>
</tr>
<tr>
<td>Graft Type D6 is equal to Physician modified</td>
<td>= (is equal to)</td>
<td></td>
</tr>
</tbody>
</table>

**ELSE value is equal to No**

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
CUSTOM GRAFT (ZFEN)
EBL (ML) (LOWER BETTER)

Regional Variation

EBL (ml)

Mean

Pacific Northwest Vascular Study Group
Mountain, Vascular Study Group
Southwest Vascular Study Group
Southern Vascular Outcomes Study Group
Midwest Vascular Study Group (New Mexico)
Michigan Vascular Study Group
Virginia Vascular Study Group
Southern California Vascular Study Group
Mid-Atlantic Vascular Study Group
Cape Cod Vascular Study Group

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSC, LLC, is considered privileged and confidential.
MODIFIED GRAFT (PMEG)
EBL (ML) (LOWER BETTER)

Regional Variation

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
**TEVAR**
**EBL (ML) (LOWER BETTER)**

**Regional Variation**

- **Mean**
- **EBL (ml)**

*Red line*: Indicates overall national participant rate.
*Others*: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
HMC VS. PNW
EBL (ML) (LOWER BETTER)

- HMC
  - Mean Modified EBL (mL): 88.4
  - Mean TEVAR EBL (mL): 87.5

- Other PNW
  - Mean Modified EBL (mL): 603.6
  - Mean TEVAR EBL (mL): 308.1

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
CUSTOM GRAFT (ZFEN)  
FLOURO TIME (MINS)(LOWER BETTER)

Regional Variation
Fluoroscopy Time (minutes)

Green line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
MODIFIED GRAFT (PMEG)
FLOURO TIME (MINS) (LOWER BETTER)

Regional Variation
Fluoroscopy Time (minutes)

**Red line:** Indicates overall national participant rate.
**Others:** Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Regional Variation

Fluoroscopy Time (minutes)

**Red line:** Indicates overall national participant rate.

**Others:** Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
HMC VS. PNW

FLOURO TIME (MINS) (LOWER BETTER)

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Regional Variation

Iodinated Contrast (ml)

Mean

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSCO, LLC, is considered privileged and confidential.
Regional Variation
Iodinated Contrast (ml)

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
TEVAR CONTRAST USAGE (ML) (LOWER BETTER)

**Regional Variation**
Iodinated Contrast (ml)

Mean

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSQ, LLC, is considered privileged and confidential.
HMC VS. PNW
CONTRAST USAGE (ML)(LOWER BETTER)

HMC
- Mean Modified Contrast Usage (mL): 102.1
- Mean TEVAR Contrast Usage (mL): 72.8

Other PNW
- Mean Modified Contrast Usage (mL): 121.9
- Mean TEVAR Contrast Usage (mL): 102.7

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Regional Variation

Calculated access type percutaneous femoral access = Yes

Percentage

25%

50%

75%

100%

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.

UW Medicine
Regional Variation

Calculated access type percutaneous femoral access = Yes

Percentage

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
TEVAR PERCUTANEOUS FEMORAL ACCESS (HIGHER BETTER)

Regional Variation
Calculated access type percutaneous femoral access = Yes

Percentage

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canadian Vascular Study Group</td>
<td>40%</td>
</tr>
<tr>
<td>Eastern Vascular Study Group</td>
<td>50%</td>
</tr>
<tr>
<td>Midwest Vascular Study Group</td>
<td>60%</td>
</tr>
<tr>
<td>Southern California Vascular Study Group</td>
<td>70%</td>
</tr>
<tr>
<td>NorCal West Vascular Study Group</td>
<td>80%</td>
</tr>
<tr>
<td>North East Vascular Study Group</td>
<td>90%</td>
</tr>
<tr>
<td>Pacific Vascular Study Group</td>
<td>100%</td>
</tr>
</tbody>
</table>

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
HMC VS. PNW
PERCUTANEOUS ACCESS (HIGHER BETTER)

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
ZFEN TOTAL PROCEDURE TIME (MINS) (LOWER BETTER)

Regional Variation

Total Procedure Time (minutes)

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Regional Variation

Total Procedure Time (minutes)

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
TEVAR TOTAL PROCEDURE TIME (MINS) (LOWER BETTER)

Regional Variation

Total Procedure Time (minutes)

Mean

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
HMC VS. PNW TOTAL PROCEDURE TIME (MINS) (LOWER BETTER)

<table>
<thead>
<tr>
<th></th>
<th>HMC</th>
<th>Other PNW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Modified</td>
<td>137.7</td>
<td>230.4</td>
</tr>
<tr>
<td>Procedure Time (mins)</td>
<td></td>
<td>215.2</td>
</tr>
<tr>
<td>Mean TEVAR</td>
<td>110.2</td>
<td></td>
</tr>
<tr>
<td>Procedure Time (mins)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
ZFEN RE-INTERVENTION (RELATED) (LOWER BETTER)

Regional Variation

Re-intervention = Yes, related

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
MODIFIED GRAFT RE-INTERVENTION (RELATED) (LOWER BETTER)

Regional Variation
Re-intervention = Yes, related

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Regional Variation

Re-intervention = Yes, related

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
HMC VS. PNW RE-INTERVENTION (RELATED) (LOWER BETTER)

<table>
<thead>
<tr>
<th></th>
<th>HMC</th>
<th>Other PNW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modified Re-intervention (Related) %</td>
<td>3.8%</td>
<td>0%</td>
</tr>
<tr>
<td>TEVAR Re-intervention (Related) %</td>
<td>3.9%</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Regional Variation

Any Post-op Complication = Yes

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Regional Variation

Any Post-op Complication = Yes

Percentage

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
HMC VS. PNW ANY POST-OP COMPLICATION (LOWER BETTER)

Modified Any Post-Op Complication %
- HMC: 11.5%
- Other PNW: 24.4%

TEVAR Any Post-Op Complication %
- HMC: 29.6%
- Other PNW: 28.6%

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
ZFEN

LENGTH OF STAY (DAYS) (LOWER BETTER)

Regional Variation

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSC, LLC, is considered privileged and confidential.
MODIFIED GRAFT
LENGTH OF STAY (DAYS) (LOWER BETTER)

Regional Variation

Length of Stay

Mean

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSC, LLC, is considered privileged and confidential.
TEVAR
LENGTH OF STAY (DAYS) (LOWER BETTER)

Regional Variation
Length of Stay

Mean

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSC, LLC, is considered privileged and confidential.

11.9
HMC VS. PNW

LENGTH OF STAY (DAYS) (LOWER BETTER)

<table>
<thead>
<tr>
<th>HMC</th>
<th>Other PNW</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7</td>
<td>11.5</td>
</tr>
<tr>
<td>14.5</td>
<td>11.6</td>
</tr>
</tbody>
</table>

Modified Mean Length of Stay (Days)

TEVAR Mean Length of Stay (Days)

Notice: This patient safety work product generated within the SVS PSC, LLC, is considered privileged and confidential.
Regional Variation
Not Discharged Home = Yes

- Red line: Indicates overall national participant rate.
- Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Regional Variation

Not Discharged Home = Yes

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.

Notice: This patient safety work product generated within the SVS PSO, LLC, is considered privileged and confidential.
Regional Variation

Not Discharged Home = Yes

Red line: Indicates overall national participant rate.
Others: Indicates centers that do not belong to a regional group.
HMC VS. PNW

NOT DISCHARGED HOME (LOWER BETTER)

<table>
<thead>
<tr>
<th></th>
<th>Modified Not Discharged Home %</th>
<th>TEVAR Not Discharged Home %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMC</td>
<td>6.4%</td>
<td>32.2%</td>
</tr>
<tr>
<td>Other PNW</td>
<td>7.1%</td>
<td>21.8%</td>
</tr>
</tbody>
</table>

Notice: This patient safety work product generated within the SVS PSCO, LLC, is considered privileged and confidential.
Meeting Evaluation:

- What did you like about this meeting?
- What did you dislike about this meeting?
- What can we do better?
Upcoming Meetings

- Spring 2019
  - May 23, 2019 – The evening prior to the Pacific Northwest Vascular Society Annual Meeting in Seattle at the Convention Center

- Fall 2019

- Spring 2020