Vascular Study Group of New England (VSGNE)

November 11, 2016
10:00 am- 4:00 pm
St. Francis Hospital
Welcome:

John F. Rodis, MD, MBA
President, St. Francis Hospital

Daniel J. Diver, MD
Hoffman Heart Institute
VSGNE 2015
31 Participating Centers

16 Community - 15 Academic
Agenda:

10:00 -10:10 AM Welcome by St. Francis President John F. Rodis, MD, MBA, and Daniel J. Diver, Director, Hoffman Heart Institute

1010 – 11:45: National Committee Updates I:
- VQI initiatives update – Jack Cronenwett (20 min)
- Regional Reports Review – Philip Goodney / Jack Cronenwett / Jens Jorgensen (30 min)
- LTFU Update – Jens Jorgensen (10 min)
- BEST: Matt Menard/Alik Farber / Goodney * (10 min)
- PCORI / Patient Advisor Course: Addi Faerber (10 min)
- VQI National Research Advisory Council Update – Philip Goodney (5 min)
- Data Coordinator Discussion forum – should we have breakouts again? (5 min Goodney)

• Break (10 min)

11:55-12:20: National Committee Updates II:
- Arterial Quality Council Update – Andres Schanzer (5-10 min)
- Venous Quality Council Update – Mark Iafarti (5 min)
- Governing Council Update – Phil Goodney (5-10 min)
- Pathways Development Update: Deb MacAulay, M2S (10 min)

12:20-12:45 Lunch break

12:45-1:15: Clinical Discussion Panel: Decision-making for Carotid Surgery
- Carotid Endarterectomy case presentation : S. Fecteau / Designee (15 min)
- Carotid Stenting case presentation Akhilesh Jain, Hartford Hospital (15 min)
- Discussion – how can VQI data add value in these settings?

1:15-1:45: Using VQI data over time – quality and my hospital system
- Steve Ruby, MD, St. Francis (15 min)
- Naomi Eisenberg, PT, Med, University of Toronto (15 min)
- Sebastian Didato, Concord Hospital (15 min)
- Discussion

• 1:45-2:15: EVAR LOS in VQ (Brian Nolan)

• Break (10 min)

2:30-2:45 VSGNE RAC and VSGNE Quality Committee
- VSGNE RAC Update: Andy Schanzer *
- Quality Committee Update: Jessica Simons

2:45-3:15 pm Research Progress Reports
- UMass trainees (Sathish Mohan, TBD)
- Yale trainees (Myriam Jean, TBD)
- DHMC trainees (Jesse Columbo, TBD)
- BIDMC Trainees (S. Deery, TBD)

• 3:15-3:30: Meeting evaluation, planning.
VQI Update

Jack L. Cronenwett, M.D.

November 11, 2016
Vascular Quality Initiative®

Participating Center Growth

VQI Participating Centers

395 Centers, 46 States + Ontario
Vascular Quality Initiative®

### Total Procedures Captured (as of 10/1/2016)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Count</th>
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<tr>
<td>Peripheral Vascular Intervention</td>
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<tr>
<td>Carotid Endarterectomy</td>
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<tr>
<td>Infra-inguinal Bypass</td>
<td>33,098</td>
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<tr>
<td>Endovascular AAA Repair</td>
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<td>Hemodialysis Access</td>
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<td>Carotid Artery Stent</td>
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<td>Supra-inguinal Bypass</td>
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<tr>
<td>Open AAA Repair</td>
<td>8,724</td>
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<td>Thoracic and Complex EVAR</td>
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<td>IVC Filter</td>
<td>6,196</td>
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<tr>
<td>Lower Extremity Amputations</td>
<td>6,029</td>
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</tbody>
</table>

**322,972 Total Procedures Captured**

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**VQI Total Procedure Volume**

**7500 New Procedures per Month**
QI Project Guide
Society for Vascular Surgery Patient Safety Organization®

Table of Contents
Section
Overview
1. Initiate Project
   Project Charter
   Work Plan
2. Change Management
   Elevator Speech
   Stakeholder Analysis
3. Establish Baseline
   VQI Report – Variation in LOS
   VQI Case Study – VWH Regional & National
   VQI Case Study – Metrics Dashboard
   Process Map – Discharge Medications
4. Identify Root Cause (Generate Hypotheses)
   VQI Case Study – VWH ICU and EOS
   Pareto Chart
   VQI Analytic – Variation in LOS
   Failure Modes Effects Analysis (FMEA)
5. Develop Potential Solution
   Benefit/Cost Matrix
6. Implement Improvement
   Change Management – Implementation
   VQI Case Study – Reimbursement
7. Evaluate
   Evaluation/Action Plan
   VQI Case Study – Memorial Hospital
QI Resources
Appendix A1: QI Tools & Template
Appendix A2: Project Charter
Appendix A3: Pareto Chart
Appendix A4: Failure Modes Effects Analysis (FMEA)
Appendix A5: Evaluation
Appendix A6: Sample Process Map
Appendix A7: Sample Production Report

QI Project Guide
Society for Vascular Surgery Patient Safety Organization®

Establish Baseline, continued

In addition to identifying baseline performance, it is important to document the current operation using another QI tool, the Process Map. The project team will gain important insights into the underlying operations from both the end of creating the Process Map and the map itself.

When establishing baseline performance and to gain a better understanding of the process to be improved, it is critical to develop an accurate Process Map. Creating a Process Map is challenging because teams must focus strictly on what is actually happening rather than what they think is happening.

Teams may struggle with drawing a map that represents reality. To guide against this, involve staff and other key stakeholders directly in the process. In addition to gaining their insight, they may also gain their trust, which will make them more likely to engage with the project.

Benefits of Process Maps:
- Can reveal unnecessary, complex, and redundant steps in a process. This makes it possible to simplify and standardize.
- Can validate actual processes against the map, allowing what went wrong where.
- Can identify steps where additional data can be collected.
VQI@VAM 2017 – May 30,31 – San Diego

• Expand to 1.5 days, Tue pm (data managers) and all day Wed
• Summary of this year’s meeting available online at: http://www.vascularqualityinitiative.org/successful-inaugural-vqi-annual-meeting-svs-pso-now-planning-next-year/
• Download slides on “Resource Tab” of M2S Pathways
• Bi-monthly webinars being presented on QI techniques, alternating with data managers webinars on data form details
  – Carrie Bosela  c.bosela@svspso.org
PSO Leadership Strategic Planning Meeting
September, 2016

Major Themes for the Planning Meeting included:
• Improving Quality and Patient Outcomes
• Data Accuracy and Integrity
• Optimizing Participation and Engagement
• Long-Term Sustainability and Operational Effectiveness
Improving Quality and Patient Outcomes

- Develop QI project opportunity for each registry
- Review and update the key quality measures for each registry and report these to physicians and centers
- Communicate to members the value of using VQI Qualified Clinical Data Reporting to participate in MIPS/MACRA
- Collaborate with SVS on the creation of Clinical Guidelines and Best Practices, including appropriateness of care.
Data Accuracy and Integrity

• Continued emphasis on improving LTFU
• Analyze data on “Cases Submitted Without Validation” by M2S enhancement that allows each variable missing to be separately analyzed and reported to centers
• Pilot project using statistical analysis to determine if variables can be eliminated without impact (CEA)
• Increase statistical audits for data accuracy
• Increase training and education for data managers
Vascular Quality Initiative®

Optimizing Participation and Engagement

• Continue to increase frequency of quality reporting (COPI and Physician Reports)
• Repeat previously issues COPI and/or Physician Reports to show change over time
• Identify ways to improve Regional Meeting attendance
• Provide education on QI Project Guide
• Create and disseminate best practice case studies
• Engage quality improvement staff from VQI sites
Long-Term Sustainability and Operational Effectiveness

- Create a web-based infrastructure for increased audit activity
- Prioritize registry maintenance and development
- Continue to improve reporting and analytics
- Expand VQI Annual Meeting to include additional time for data manager education and networking
National Quality Improvement Projects

• Prescribe anti-platelet and statin after arterial treatment
• Measure aneurysm sac size one-year after EVAR and TEVAR

• More initiatives being developed, one for each registry

• Goal: Center commitment to at least one national QI project
  – Add to VQI Participation Award qualifications next year
Research Projects Using VQI Data

- National and Regional Research Advisory Committees
  - Review, support and coordinate projects

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<td>Unique Centers</td>
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<tr>
<td>Publications</td>
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<td>40</td>
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</table>
Medical Management Registry

- Joint project with Society for Vascular Medicine
- New patients managed medically with:
  - Lower extremity
  - AAA
  - Carotid artery disease
- Will allow comparative effectiveness with Infra, Supra, PVI
- In development, launch before June, 2017

Hemodialysis, Supra, Infra registries targeted for update in 2017
FDA-Industry Device Evaluation Projects

• Post-approval surveillance
  – Type B aortic dissection devices, multiple manufacturers
  – Stents for popliteal artery disease

• Expansion of existing device indications
  – In-stent restenosis in addition to de novo SFA lesions
  – Extending length of lesions approved for stent treatment

• Objective performance goals to compare new devices
  – Using data for comparable treatment with other devices
  – Large amount of data with follow-up for propensity analysis
Collaboration with CMS to provide reimbursement for TCAR in medical high risk symptomatic or asymptomatic patients if entered into VQI CAS Registry + 1 Yr follow-up

Data will be compared with outcome of CEA procedures in VQI during the same time interval

Goal is to generate real-world data for future decisions about coverage of TCAR as distinct from trans-femoral CAS

New CAS Registry data form will be released November 28

Enter TCAR case using FDA approved stent/flow-reversal into Registry, submit Medicare claim using NCT 02850588

More info at clinicaltrials.gov
Vascular Quality Initiative

Registry Assessment of Peripheral Interventional Devices (RAPID)

• Collaborative project with VQI, ACC, SIR, FDA, CMS, Industry organized by Medical Device Epidemiology Network
• Developed core data set of 100 key data elements central to PVI device evaluation (based on existing registries and CRFs)
• Goal is to allow device evaluation by extracting interoperable data from different sources (registries, EHRs, payers)
• VQI has already inserted all RAPID core data elements into new PVI data form released in September
SVS PSO QI Guide: Volunteer to complete charter and follow guide?

Access QI Guide on M2S pathways website using their member IDs under the Resource section.

Identify data manager and physician leader to initiate QI process. Schedule of webinars on QI implementation to be released.
EPIC Update

- Dr. Michael Stoner and Dr. Robert Steppacher discussed Epic-VQI integration on Monday, September 19th at the annual Epic Users’ Group Meeting (UGM) in Verona, WI.
  - Slides and audio from the presentation will be available at userweb.epic.com approximately one month after the meeting
- Smart Data Elements to capture VQI variables for CEA have been released.
  - Ask your IT staff to contact their Cupid or OpTime TS and ask for SU package E8204331
  - A guide to how to configure VQI note templates to use SDEs is available in the resource tab of VQI
- Smart Data Elements for PVI are under construction, we expect these to be available Q4 2016.
PSO Executive Committee Update
Strategic Planning Session

Major Themes for the Planning Sessions included:

- Improving Quality and Patient Outcomes
- Data Accuracy and Integrity
- Optimizing Participation and Engagement
- Long-Term Sustainability and Operational Effectiveness
Improving Quality and Patient Outcomes

- Launch National QI projects, potentially Discharge Meds and EVAR LTFU
- Review and update the key quality measures for each registry and that these measures are reported to its members. These measures should also align to MACRA/MIPS and future APMs.
- Develop messaging on how the QCDR/PQRS measures can help compliance with MIPS for 2017/2018, prior to the creation of a vascular APM.
- Collaborate with SVS on the creation of Clinical Guidelines and Best Practices, inclusive of appropriateness of care.
Data Accuracy and Integrity

- Continued focus on improving LTFU
- Analyze data on “Cases Submitted Without Validation”
- Pilot Project Using Statistical Analysis to Determine if Variables can be Eliminated (CEA)
- Increase Audits by Frequency and Type
- Increase Training and Education for Data Managers
- Leverage Regional Meetings to Enhance Data Capture and Integrity
Optimizing Participation and Engagement

- Continued Interim Quality Reporting (COPI and Physician Reports)
- Repeat previously issues COPI and/or Physician Reports to show Change Over-Time
- Identify ways to Improve Regional Meeting Participation
- Provide Education on QI Project Guide
- Create and Disseminate Best Practice Case Studies, Featuring VQI Success Stories
- Engage Quality Personnel from VQI Sites in Improvement Efforts
Long-Term Sustainability and Operational Effectiveness

- Create an Infrastructure for Increased Audit Activity
- Prioritize Registry Maintenance and Development
- Continue to Improve Reporting and Analytics
- Expand VQI Annual Meeting to Include Additional Time for Data Manager Education and Networking
EMR Integration Status Updates

• Integration for Varicose Vein procedure form
  – Released and officially certified 2 vendors
    • Medstreaming
    • Mtuitive

• Integration for PVI procedure form
  – Planned to be available in Q4 2016

• Integration for procedure forms of other registries
  – Planned to be available in 2017

• Integration for follow-up forms
  – Planned to be available in 2017
Lombard Aorfix Surveillance Project

• Enrolling patients and sites!
• Enrollment target: 234 patients
  – Enrollment to date: 38 patients
• Custom content
  – Datafields: ~ 10 fields
  – Timepoints: 30d, annually through 5 yrs
  – Other: Send images to Core Lab

Contact the Project Managers at AorfixProject@m2s.com for more information
TEVAR Surveillance Project

- Longest running VQI Surveillance project
- Two cohorts
  - 5 year cohort is fully enrolled
  - 1 year cohort – enrollment is in progress
- The earliest patients are reaching the 3-year timepoint
- The FDA is very enthusiastic about using registries for post-market surveillance quality improvement projects

Contact the Project Managers at TEVARProject@m2s.com for more information
CREST 2 Registry Project

- CAS Registry with Supplemental 1-page form
- Enrolling
- 64 Physicians are participating through VQI
- Objectives
  - Promote rapid initiation and completion of enrollment in the CREST-2 trial
  - Ensure that CAS is performed by adequately experienced operators within CREST-2 and C2R
  - Closely monitor clinical outcomes of C2R patients
  - Prevent inappropriate use of CAS outside of C2R
- C2R Investigators have received 10 reports
  - Patient-level data is non-identifiable per HIPAA
  - Physician and center names are transferred IAW project data sharing agreement
Bard Peripheral Vascular LifeStent

• Bard has recently partnered with the VQI for a post approval project for the LifeStent® Vascular Stent System.
• Invitations sent
• Patients: 74 patients
• Timepoints: Procedure, 1 yr, 2 yr
  – Less than 5 custom VQI content
  – Images sent to Imaging CoreLab at 1 yr. and 2 yr. if specific Adverse Events are reported
TransCarotid Revascularization Surveillance Project (TSP)

- The VQI has launched a surveillance project to evaluate the safety and effectiveness of trans-carotid artery revascularization (TCAR) in comparison with carotid endarterectomy (CEA).

- The VQI TSP was approved on Sept. 1 by the Centers for Medicare and Medicaid Services under the current National Coverage Determination.

- TCAR cases that fall within the inclusion criteria to be reimbursed by CMS, under the TCAR Surveillance Project # NCT02850588, must be entered into the new CAS data form to be eligible for reimbursement.

- The current SVS PSO CAS Registry must be revised to capture appropriate data for the TSP. This revision is expected to be completed by late November.
TransCarotid Revascularization Surveillance Project (TSP)

• The TSP requires that the procedure be performed in high surgical risk patients (asymptomatic or symptomatic) and that data about the procedure and one-year follow-up be submitted to the VQI CAS Registry in order to qualify for Medicare coverage.

• Anyone choosing to participate in the TSP must enter all TCAR and CAS data into the VQI CAS registry.

2016 QCDR Program

• A QCDR is a CMS-approved entity that collects medical and/or clinical data for the purpose of patient and disease tracking to foster improvement in the quality of care provided to patients.

• Individual EPs who satisfactorily participate in 2016 PQRS through a QCDR may avoid the 2018 negative payment adjustment.

26 Measures Available in 2016

• To successfully participate:
  – 9 measures
  – across 3 domains
  – 2 outcome measures
  – reporting rate > 50%
  – Medicare patients
  – 2015 procedures must be followed up by 12/31/2016
Email Deliverability

Have you experienced problems receiving our email newsletters or PATHWAYS updates? Contact us at vqi@m2s.com if you are not receiving emails from the VQI or PATHWAYS.

Types of emails we are currently sending:
• VQI Pulse eNewsletter
• PATHWAYS product updates
• VQI Registry news
• Webinar events
• and much more!
The VQI is celebrating its Anniversary!

5 YEARS

12 CLINICAL REGISTRIES

OVER 290,000 PROCEDURES

3,000 Physicians

Over 375 Participating Centers
New VQI Customers (Nov 18th)
Give us a chance to show you the power of your data.
Choose FIVE or more registries and your site will save $2,500 off your first year!

Current VQI Customer (Dec 31st)
Thank you for playing such a big role in our success.
Add an additional VQI registry to your package, and receive a one-time $500 credit, per site, at the time of renewal.
Toronto General Hospital

VQI and Quality Improvement
November 11, 2016

Naomi Eisenberg, PT, MEd,
Graham Roche-Nagle, MD, MBA
Vascular Surgery at Toronto General
(a division of University Health Network)

• Department of Surgery
• Peter Munk Cardiac Centre
• Fully affiliated with University of Toronto Faculty of Medicine
• 8 Vascular Surgeons (4.4 FTE)
• Joined VQI in August 2010
• Modules:
  – CEA
  – EVAR
  – Infra inguinal bypass
  – Open AAA
  – PVI
  – Supra
  – TEVAR
• > 2000 patients by end of year
• ~ 2300 cases
• Follow up rate of > 90% consistently over our participation
• Patient Follow up > 90%
Departmental Quality Initiatives

- Improving risk factor modification (ongoing)
- LOS following EVAR
- PVI outcomes
- LEB length of stay
- Iodinated contrast
- Wound infection rates
- Presentations at National Conferences
• Monthly Quality Rounds
  – COPI reviews
  – Discussion during teaching
Smooth sailing?
Challenges: *Initial*

- Ethics approval
  - Anonymized data (federal/provincial law)
    - Creation of a system to de/anonymize data
    - Daily/Weekly notification for VQI numbers
    - Communication with clinical admin staff
  - No 3% reimbursement
Challenges: **Ongoing**

- Follow up system
  - Pulling anonymized data at 10 months, reidentifying for physician offices
- Self-paying
- Regional Group
- Competitive databases
  - NSQIP
  - prov. Gov’t
- Audits manually done
- No ability to autopopulate
Quality improvement in elective EVAR length of stay using risk adjusted VQI comparisons: A local study

Naomi Eisenberg, PT MEd
George Oreopoulos MD
Graham Roche-Nagle, MD
Thomas F. Lindsay, MD
Objectives

• Demonstrate how VQI data analysis can identify local opportunities for QI

• Show how VQI can be leveraged to improve quality of care and drive potential cost savings
TGH: sicker patients, longer than expected LOS (4.5)
Sorry sir, but we hope you're okay to go home today.
2013

• Reviewed elective infrarenal EVAR to examine LOS issues (N = 113)
• 59% LOS > 2 days
  • Univariate factors: CV, wound, urology
  • Multivariate: CV, wound
• Instituted
  • Patient/staff education re LOS expectations
  • Changes in surgical/anaesthesia/allied health practice
2011 – 2012: EVAR LOS extends beyond VQI benchmark at UHN

**OBSERVED > RISK-ADJUSTED EXPECTED LOS**

** significantly higher than expected values

* significantly lower than expected values
2013: reversal of extended LOS- 6 months after intervention

OBSERVED LOS << RISK-ADJUSTED EXPECTED LOS

**Significantly lower than expected values**

Adjusted for: Age, Gender, Race, COPD, Creatinine (mg/dl), Pre-admin Living, Pre-op ASA / Pre-op P2Y12 Antagonist, Pre-op Statin, Ejection Fraction, Maximum AP AAA Diam, Iliac Aneurysm
2013 -- 2014: Still maintaining lower than expected LOS

New questions:

• Have we saved $$?

• What can analysis of patients with a markedly extended LOS (> =6 days) tell us?

Observed values (both groups) significantly lower than expected

• LOS reduced by 1 day (avg. 3.8 vs 3, med = 1)
  – *Significantly different total LOS between cohorts
  – P = .000

• Hospital days saved: 34

• Average cost (unadjusted):
  – $27191 (1st cohort) vs $26275 (2nd cohort)
Financial Impact

• Bank of Canada Inflation Calculator (2001 dollars)
  • Cohort 1: 22021.35
  • Cohort 2: 20568.50

• Difference $1452.85/case (↓6.6%)
Conclusions

- **VQI** allows for in-depth analysis in real-time and can act as a springboard other analyses
- Sustained change in practice led to sustained benefit over time (6.6% decreased cost, ↓ LOS)
- Some patients continued to stay longer
  - Should they have surgery?
- Important data for Canadian surgeons/centres
• Patient Follow up > 90%
10 months post op procedure

Forms pulled and patients re-identified

E-chart reviewed; date of appointment attached or due date indicated

Forms returned to offices to arrange f/u

“overdue” list distributed to surgeon/admin assist **monthly

Data entered into VQI
Looking forward:

• 3 Canadian centres now on board
Thank you
Questions?
Business Discussion:

- Review redlined bylaw changes
Expanding Participation

Waiting on list from M2S
Regional Reports:
Phil Goodney, MD

Note: In all reports, regional data are not shown for regions with <3 centers participating in the applicable registry. In "by Center" bar charts, unless noted, data are not shown for centers with <10 cases.
## Total Procedure Volume, All Years

(2003-May 2016)

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<tr>
<th>Your region</th>
<th>Total procedures</th>
<th>VQI Total procedures</th>
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<td>CAS</td>
<td>1855</td>
<td>10850</td>
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<tr>
<td>CEA</td>
<td>17779</td>
<td>65763</td>
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<tr>
<td>EVAR</td>
<td>5765</td>
<td>26031</td>
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<tr>
<td>HEMO</td>
<td>2972</td>
<td>23762</td>
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<td>INFRA</td>
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<td>OAAA</td>
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<td>PVI</td>
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<td>Varicose Veins</td>
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<td>LEAMP</td>
<td>560</td>
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<td><strong>Overall</strong></td>
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## Percentage of Procedures Submitted With Missing Data (Jan 2015-May 2016)

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<th>Region</th>
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<tr>
<td>CAS</td>
<td>399 (51%)</td>
<td>3777 (51%)</td>
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<td>CEA</td>
<td>2344 (33%)</td>
<td>19909 (33%)</td>
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<tr>
<td>EVAR</td>
<td>805 (55%)</td>
<td>7773 (60%)</td>
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<td>HEMO</td>
<td>793 (21%)</td>
<td>9198 (26%)</td>
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<tr>
<td>INFRA</td>
<td>1195 (80%)</td>
<td>8048 (82%)</td>
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<tr>
<td>OAAA</td>
<td>288 (24%)</td>
<td>1825 (29%)</td>
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<td>PVI</td>
<td>3483 (58%)</td>
<td>30123 (56%)</td>
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<tr>
<td>SUPRA</td>
<td>405 (79%)</td>
<td>2755 (80%)</td>
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<td>TEVAR</td>
<td>213 (49%)</td>
<td>2337 (28%)</td>
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<td>IVCF</td>
<td>6 (0%)</td>
<td>1133 (23%)</td>
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<tr>
<td>Varicose Veins</td>
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<td>4228 (29%)</td>
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<tr>
<td>LEAMP</td>
<td>270 (72%)</td>
<td>2684 (73%)</td>
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<td>2015 overall</td>
<td>10201 (51%)</td>
<td>93790 (49%)</td>
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<tr>
<td>2014 overall</td>
<td>9405 (50%)</td>
<td>67064 (48%)</td>
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Percentage of Procedures Submitted With Missing Data (Jan 2015-May 2016)

Percentage Submitted With Missing Data in Your Region (Jan 2015-May 2016)

Percentage Submitted With Missing Data across VQI (Jan 2015-May 2016)

* Indicates region’s rate is significantly different than overall VQI rate. "Others" indicates centers that do not belong to a regional group.
### Vascular Quality Initiative®

#### LTFU Reports

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<th>Your region</th>
<th>Follow-up rate (N)</th>
<th>VQI</th>
<th>Follow-up rate (N)</th>
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<tr>
<td>CAS</td>
<td>39% (324)</td>
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<td>54% (2331)</td>
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<tr>
<td>CEA</td>
<td>50% (2041)</td>
<td></td>
<td>56% (14511)</td>
</tr>
<tr>
<td>EVAR</td>
<td>49% (710)</td>
<td></td>
<td>56% (5757)</td>
</tr>
<tr>
<td>HEMO</td>
<td>47% (697)</td>
<td></td>
<td>55% (6584)</td>
</tr>
<tr>
<td>INFRA</td>
<td>56% (1086)</td>
<td></td>
<td>60% (5865)</td>
</tr>
<tr>
<td>OAAA</td>
<td>63% (240)</td>
<td></td>
<td>62% (1414)</td>
</tr>
<tr>
<td>PVI</td>
<td>47% (2926)</td>
<td></td>
<td>53% (21120)</td>
</tr>
<tr>
<td>SUPRA</td>
<td>55% (372)</td>
<td></td>
<td>61% (2096)</td>
</tr>
<tr>
<td>TEVAR</td>
<td>34% (180)</td>
<td></td>
<td>54% (1456)</td>
</tr>
<tr>
<td>IVCF*</td>
<td>50% (4)</td>
<td></td>
<td>44% (686)</td>
</tr>
<tr>
<td>2013 overall</td>
<td>49% (8580)</td>
<td></td>
<td>55% (61820)</td>
</tr>
<tr>
<td>2012 overall</td>
<td>61% (8504)</td>
<td></td>
<td>68% (45345)</td>
</tr>
</tbody>
</table>
LTFU by Center in Your Region (2014)

YC = Your Center; * = Center rate is significantly different than overall regional rate.

LTFU by Region across VQI (2014)

* Indicates region's rate is significantly different than overall VQI rate. "Others" indicates centers that do not belong to a regional group.
Long Term Follow-Up Update

Jens Jorgensen, MD
VQI Medical Director
Discharge Medications Antiplatelet and Statin
(Jan 2015-May 2016)
Excludes missing, not treated for medical reason and non-compliant
National QI Initiative to Increase Statin Use

AP/Statin Rate, Centers in VQI 2011-Present

Mean rate=79.9%

Mean - 3SD

Presentation
Publication
Push Reports
Regional Participation Is Important

Discharge Statin Use Jan 2011 - July 2016

- Jan 2011 - July 2015
- August 2015 - July 2016

Discharge Statin Use


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Varicose Veins: Percentage of Procedures with Complete Patient-Reported Outcome Measures Recorded at Follow Up (Jan 2015-May 2016) procedures; includes only patients with any follow-up visit recorded. All regional data omitted because most regions have <3 centers. Patient-reported outcome measures (PROMs) include heaviness, achiness, swelling, throbbing, itching, appearance and impact on work in side of operation.
Percentage of Infrainguinal Bypass Procedures with Chlorhexidine or Chlorhexidine + Alcohol Skin Prep (Jan 2015-May 2016)

Chlorhexidine Rate by Center in Your Region (Jan 2015-May 2016)

Chlorhexidine Rate by Region across VQI (Jan 2015-May 2016)

* Indicates region's rate is significantly different than overall VQI rate. "Others" indicates centers that do not belong to a regional group.
Infrainguinal Bypass: Percentage of Procedures with In-Hospital Surgical Site Infection (Jan 2015-May 2016)
Percentage of Percutaneous Femoral PVI Procedures Using Ultrasound Guidance (Jan 2015-May 2016) Excludes cut–down
Rate of Hematoma After PVI (Jan 2015-May 2016)

Excluding cut-down access guidance
PVI: Percent of Patients with ABI or TBI Assessed Before Procedure
(Jan 2015-May 2016)

“ABI or TBI Assessed” indicates at least one measure was recorded for the side of the procedure, or on both sides for bilateral and aortic procedures.
EVAR: Rate of Sac Diameter Reporting at Long-Term Follow Up 2014, excluding patients without at least 9 month follow up

- Sac Diameter Reporting by Center in Your Region (2014)

- Sac Diameter Reporting by Region across VQI (2014)

* Indicates region's rate is significantly different than overall VQI rate.
TEVAR: Rate of Sac Diameter Reporting at Long-Term Follow Up
2014, excluding patients without at least 9 month follow up

Sac Diameter Reporting by Center in Your Region (2014)

Sac Diameter Reporting by Region across VQI (2014)

* Indicates region’s rate is significantly different than overall VQI rate.
Carotid Endarterectomy
Percentage of Patients with Length of Stay > 1 Day
(Jan 2015-May 2016)
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
Open AAA Repair:
Percentage of Patients with Length of Stay >= 8 Days
(Jan 2015-May 2016)

procedures, excluding ruptured aneurysms and in hospital deaths with LOS<=8 days, procedures
Endovascular AAA Repair:
Percentage of Patients with Length of Stay > 2 Days
(Jan 2015-May 2016)
procedures, Excluding symptomatic, ruptured, prior aortic surgery, in hospital deaths with LOS <=2days, procedures not done on day of admission and weekend procedures
Hemodialysis Access: Percentage of Primary AVF vs. Graft
(Jan 2015-May 2016)
procedures, excludes patients receiving AVF access who have received previous access in the forearm, upper arm or basilic vein on the same side.
IVC Filter: Percentage of Temporary Filters with Retrieval or Attempt at Retrieval
(Jan 2015-May 2016)
procedures, excluding patients who have died since discharge
(your region did not have at least 3 centers with 10 procedures)
Carotid Artery Stent: Stroke or Death in Hospital (Jan 2015-May 2016) procedures, elective, excluding prior ipsilateral CAS

CAS Stroke or Death by Center in Your Region
(Jan 2015-May 2016)

CAS Stroke or Death by Region across VQI
(Jan 2015-May 2016)
Carotid Endarterectomy: Stroke or Death in Hospital
(Jan 2015-May 2016)
procedures, elective, excluding prior ipsilateral CEA
and concomitant CABG
Infrainguinal Bypass: Percentage of Major Complications (Jan 2015-May 2016) procedures, Major complications= In hospital death, ipsilateral amputation or graft occlusion. Includes only patients with Indication=Rest Pain or Tissue Loss
Open Non-ruptured AAA: In hospital Mortality (Jan 2015-May 2016) procedures, excluding weekend procedures
Update on the BEST-CLI Trial

Phil Goodney, M.D.
BEST-CLI is in 4th gear

Site visits in progress by CCC PIs

Successful CLI dinners in Boston and NYC
  • LA and SF dinners being planned for January

DSMB meeting on 1/10/2017
  • Site data available as of DSMB data freeze (11/1/2016)
BEST Site Activation Data

• 128 of 139 sites activated
  ▪ 124 sites open for enrollment
  ▪ 11 sites closed
  ▪ 4 sites on non-enrollment status
  ▪ 18 sites in startup

• 77% of sites are multidisciplinary, whereas 23% are exclusively vascular surgery
Enrollment Update

- 1st patient randomized 28/Aug/2014

As of 11/7/2016

- 755 subjects randomized

Next Milestone: 1435 subjects by Dec. 31, 2016
BEST Investigator Data

- Investigators by Specialty (n= 811)
  - 563 Vascular Surgeons
  - 126 Interventional Cardiologists
  - 115 Interventional Radiologists
  - 7 Vascular Medicine Specialists
# BEST-CLI Enrollment by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>% of enrolled BEST Patients</th>
<th># of sites activated for enrollment (n= 128)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern</td>
<td>25%</td>
<td>31</td>
</tr>
<tr>
<td>Southern</td>
<td>20%</td>
<td>25</td>
</tr>
<tr>
<td>Midwestern</td>
<td>22%</td>
<td>27</td>
</tr>
<tr>
<td>Western</td>
<td>26%</td>
<td>32</td>
</tr>
<tr>
<td>Canada</td>
<td>7%</td>
<td>10</td>
</tr>
</tbody>
</table>
## BEST-CLI New England Sites

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Date of Activation</th>
<th># of Subjects Enrolled</th>
<th>Date of Last Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beth Israel Deaconess Med Ctr</td>
<td>10/8/14</td>
<td>10</td>
<td>11/4/16</td>
</tr>
<tr>
<td><strong>Boston Medical Center</strong></td>
<td><strong>8/28/14</strong></td>
<td><strong>40</strong></td>
<td><strong>10/20/16</strong></td>
</tr>
<tr>
<td>Brigham &amp; Women’s Hospital</td>
<td>9/23/14</td>
<td>13</td>
<td>11/7/16</td>
</tr>
<tr>
<td>Dartmouth Hitchcock Med Ctr</td>
<td>10/29/14</td>
<td>15</td>
<td>10/10/16</td>
</tr>
<tr>
<td>Maine Medical Center</td>
<td>8/17/15</td>
<td>4</td>
<td>7/28/16</td>
</tr>
<tr>
<td>Massachusetts General Hospital</td>
<td>5/6/15</td>
<td>6</td>
<td>10/5/16</td>
</tr>
<tr>
<td>Rhode Island Hospital</td>
<td>12/5/14</td>
<td>6</td>
<td>10/5/16</td>
</tr>
<tr>
<td>Steward St. Elizabeth’s Med Ctr</td>
<td>10/1/14</td>
<td>5</td>
<td>10/7/16</td>
</tr>
<tr>
<td>Miriam Hospital/Brown Med Sch</td>
<td>3/9/15</td>
<td>4</td>
<td>5/19/16</td>
</tr>
<tr>
<td><strong>UMass Medical School</strong></td>
<td><strong>12/9/14</strong></td>
<td><strong>25</strong></td>
<td><strong>9/6/16</strong></td>
</tr>
<tr>
<td>Univ. of Vermont Medical Center</td>
<td>11/3/14</td>
<td>3</td>
<td>12/17/15</td>
</tr>
<tr>
<td>Boston VA Medical Center</td>
<td>2/12/15</td>
<td>6</td>
<td>7/21/15</td>
</tr>
<tr>
<td>Yale New Haven Hospital</td>
<td>6/8/15</td>
<td>13</td>
<td>11/1/2016</td>
</tr>
</tbody>
</table>
Investigator Meeting

VEITH

Thursday, November 17th, 4:00-5:30 PM
New York Hilton Midtown
NY Suite 4th Floor
PCORI Patient Advisers Update: Addi Faerber, PhD
Addi’s slides here
Research Advisory Council Update:
Phil Goodney, MD
National Research Projects:

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

• [http://www.vascularqualityinitiative.org/vqi-resource-library/research-advisory-committee/](http://www.vascularqualityinitiative.org/vqi-resource-library/research-advisory-committee/)
Arterial Quality Council Update:
Andres Schanzer, MD
Actionable Reports

- **Physician-level Reporting**: these comparisons allow sites to analyse blinded physician results between physicians at the same site as well as between facilities to understand detailed results and best practices.

- **Site-level Reporting (Center Opportunity Profile for Improvement Reports)**: Similar to the physician data, the COPI Reports provide detailed national and regional benchmarking on quality improvement such as length of stay.
COPI and Physician Reports

• In addition to the spring and fall regional reports, this year we have published two COPI reports:
  – 30-day stroke and 1-year mortality after CEA
  – 30-day stroke or 1-year mortality after CAS
• We have also published two surgeon-level reports:
  – Percentage of high-risk patients receiving CEA
  – Percentage of patients receiving follow-up imaging after EVAR
• At least two additional reports are planned for this year:
  – COPI report on hematoma after PVI
  – Surgeon-level report on percentage of high-risk patients receiving CAS
Cardiac Risk Calculators:

- QXMD: [http://www.qxmd.com](http://www.qxmd.com)

Online Vascular Surgery Clinical Calculators

Use the following tools to estimate peri-operative risk around the time of vascular surgery.

- Carotid Endarterectomy
- Endovascular Infrarenal AAA Repair
- Lower Extremity Bypass
- Open Infrarenal AAA Repair
Current on going AQC work:

- Finalized PVI registry updates
- Updating CAS registry
- Finalize New Medicine Registry
- Determining variables per registry that negate the need for LTFU
- Data Audits
Venous Quality Council Update:
Mark Iafarti, MD
Venous Quality Council

- Less active than AQC
- Increased # of procedures looking at data and QI opportunities
## IVC Filter: 2014 (N=808)

<table>
<thead>
<tr>
<th>Reason filter placed (header)</th>
<th>Value:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary Embolism</td>
<td>290 (35.9%)</td>
</tr>
<tr>
<td>Lower Extremity DVT</td>
<td>472 (58.4%)</td>
</tr>
<tr>
<td>Free Floating Thrombus</td>
<td>8 (5.7%)</td>
</tr>
<tr>
<td>Recurrent VTE on Anticoagulant</td>
<td>66 (33.3%)</td>
</tr>
<tr>
<td>Recent Trauma</td>
<td>85 (40.9%)</td>
</tr>
<tr>
<td>Major Procedure Planned</td>
<td>141 (67.8%)</td>
</tr>
<tr>
<td>Temporary Filters Placed</td>
<td>592 (73.7%)</td>
</tr>
<tr>
<td>Temporary Filters Removed/Attempt to remove</td>
<td>172 (63.2%)</td>
</tr>
<tr>
<td>Post op New DVT</td>
<td>11 (3.5%)</td>
</tr>
<tr>
<td>Post op New PE</td>
<td>3 (1%)</td>
</tr>
<tr>
<td>Post op Filter complication</td>
<td></td>
</tr>
<tr>
<td>Migration &gt;20 mm cephalad</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Migration &gt; 20 mm caudal</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Filter Angle Increases &gt;15 degrees</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Filter Fracture</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Caval/Iliac Vein Thromosis</td>
<td>4 (0.9%)</td>
</tr>
<tr>
<td>Thrombosis in Filter</td>
<td>2 (0.4%)</td>
</tr>
<tr>
<td>Embolization filter/fragments</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Vein Wall perforation</td>
<td>5 (1.1%)</td>
</tr>
</tbody>
</table>
# Varicose Veins

## Varicose Vein: 2015 (N=2972)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average (SD) VCSS score</td>
<td>8.5 (3.9)</td>
</tr>
<tr>
<td>Ablation Treatment</td>
<td></td>
</tr>
<tr>
<td>Thermal, RF</td>
<td>831 (28.4%)</td>
</tr>
<tr>
<td>Thermal, Laser</td>
<td>611 (20.9%)</td>
</tr>
<tr>
<td>Mechanochemical</td>
<td>17 (0.6%)</td>
</tr>
<tr>
<td>Chemical</td>
<td>220 (7.5%)</td>
</tr>
<tr>
<td>Embolic Adhesive</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Surgery</td>
<td>1251 (42.7%)</td>
</tr>
<tr>
<td>Pre Op average (SD) CEAP</td>
<td>3.2 (1.3)</td>
</tr>
<tr>
<td>Post Op average (SD) CEAP</td>
<td>2.3 (1.6)</td>
</tr>
<tr>
<td>Post Op average (SD) VCSS score</td>
<td>4.2 (3.8)</td>
</tr>
<tr>
<td>Post Op compression</td>
<td>1179 (71.4%)</td>
</tr>
<tr>
<td>Post Op treated vein recanalyzed</td>
<td>25 (1.4%)</td>
</tr>
</tbody>
</table>
Governing Council Update:
Phil Goodney, MD
GC meeting at VAM

• The Governing Council approved the policy of un-blinding LTFU Reporting Rates, if a majority of members of the regional group agree to un-blind the LTFU data.

• M2S and Medstreaming provided the Committee with an overview on what the acquisition might afford VQI members:
  – Enhanced Analytics
  – Experience with data integration from EMRs
  – Extensive experience with outpatient data that complements M2S experience with inpatient data.

• Announcement of the new PSO Communications Committee
  – Glen Jacobowitz from NYU Langone, Chair
  – Leila Mureebe from Duke University Medical Center, Vice Chair
Pathways Development Update:
Debbie MacAulay, M2s
Drill Down – Procedures With Both Statin and Antiplatelet Agents Prescribed at Discharge

<table>
<thead>
<tr>
<th>Procedure Variable Name</th>
<th>My Center Results (N=809)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge Statin and antiplatelet agents prescribed</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>12.0% (97)</td>
</tr>
<tr>
<td>Yes</td>
<td>88.0% (712)</td>
</tr>
<tr>
<td>Missing Value or N/A</td>
<td>0.0% (0)</td>
</tr>
</tbody>
</table>
Drill down – Procedures With Both Statin and Antiplatelet Agents Prescribed at Discharge

<table>
<thead>
<tr>
<th>Registry</th>
<th>First Name</th>
<th>Last Name</th>
<th>Procedure Date</th>
<th>MRN</th>
<th>Physician</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infra-inguinal Bypass</td>
<td>Paul</td>
<td>Bearer</td>
<td>07/01/2015</td>
<td>123</td>
<td>Marcus Jekyll</td>
</tr>
<tr>
<td>Supra-inguinal Bypass</td>
<td>Paul</td>
<td>Bearer</td>
<td>07/01/2015</td>
<td>123</td>
<td>Marcus Jekyll</td>
</tr>
<tr>
<td>Peripheral Vascular Intervention</td>
<td>Paul</td>
<td>Bearer</td>
<td>07/01/2015</td>
<td>123</td>
<td>Marcus Jekyll</td>
</tr>
<tr>
<td>Thoracic and Complex EVAR</td>
<td>Paul</td>
<td>Bearer</td>
<td>10/01/2015</td>
<td>123</td>
<td>Marcus Jekyll</td>
</tr>
<tr>
<td>Open AAA Repair</td>
<td>Zaphod</td>
<td>Beeliebrox</td>
<td>12/03/2015</td>
<td>123432</td>
<td>Bob Moloney2</td>
</tr>
<tr>
<td>Endo AAA Repair</td>
<td>Valentine</td>
<td>Smith</td>
<td>02/04/2014</td>
<td>52445456</td>
<td>Walter J Freeman</td>
</tr>
<tr>
<td>Thoracic and Complex EVAR</td>
<td>Valentine</td>
<td>Smith</td>
<td>02/03/2015</td>
<td>52445456</td>
<td>Walter J Freeman</td>
</tr>
<tr>
<td>Infra-inguinal Bypass</td>
<td>TestT7</td>
<td>Test0</td>
<td>03/20/2013</td>
<td>1000001</td>
<td>F991 L691</td>
</tr>
<tr>
<td>Peripheral Vascular Intervention</td>
<td>TestT7</td>
<td>Test0</td>
<td>03/20/2013</td>
<td>1000001</td>
<td>F991 L691</td>
</tr>
<tr>
<td>Peripheral Vascular Intervention</td>
<td>TestT7</td>
<td>Test0</td>
<td>04/19/2013</td>
<td>1000001</td>
<td>F991 L691</td>
</tr>
</tbody>
</table>
**Drill down – Procedures With Both Statin and Antiplatelet Agents Prescribed at Discharge**

### Patient Information
- **First Name**: Paul
- **Date of Birth**: 11/04/1961
- **Last Name**: Spencer
- **SSDI Date of Death**:

### General-Demographics
- **Zip/Postal Code**: 12345
- **Hispanic or Latino**: No
- **Height (inches)**: 66.0
- **Weight (lbs)**: 209.8
- **Visit Code**: 2
- **Admit Date**: 07/01/2015
- **Did Primary Physician bill to Medicare Part B?**: Self Pay
- **Primary Insurer**: None
- **Smoking**: Never
- **Hypertension**: No
- **Gender**: Male
- **Race**: White
- **Height (cm)**: 162.0
- **Weight (lbs)**: 91.0
- **Primary Physician**: Merchant, John W
- **Procedure Date**: 07/01/2015
- **Assistant**: None
- **Transferred From?**: No
- **Quit Smoking Date**:
- **Diabetes**: No
Drill Down Permissions

• Physicians can only drill down to their own patient level data

• Hospital Manager and all other non-physician users can only drill down if they have permissions to the “procedure and follow up download reports” privilege (granted by M2S with hospital manager approval)
## Shared Reports – Where to find them

### Create a New Common Variables Report:
- Common Variables

### Create a New Life Table Report for:
- Intrainguinal Bypass Freedom from Amputation
- PVI Freedom from Major Amputation
- PVI Freedom from Target Lesion Revascularization

### Create a New Risk Adjusted Report for:
- In-hospital Death after Primary Isolated Elective CEA
- LOS > 1 Day after Primary Isolated Elective CEA
- In-hospital Stroke after Primary Isolated Elective CEA
- In-hospital Stroke or Death after Primary Isolated Elective CEA
- LOS > 2 Days after Elective EVAR

### Create a New Custom Report for:
- Carotid Endarterectomy
- Carotid Artery Stent

#### PATHWAYS Shared Reports:

<table>
<thead>
<tr>
<th>Report Name</th>
<th>Type</th>
<th>Created on</th>
<th>Updated on</th>
<th>Shared</th>
<th>Retired</th>
<th>Shared by</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS First Op Complications</td>
<td>Carotid Artery Stent</td>
<td>06/14/2016</td>
<td>06/24/2016</td>
<td>✔️</td>
<td>✔️</td>
<td>WHEADON-ADMIN</td>
</tr>
<tr>
<td>Elective TEVAR Aneurysm for All Complications Except Death</td>
<td>Thoracic and Complex EVAR</td>
<td>01/07/2016</td>
<td>06/15/2016</td>
<td>✔️</td>
<td>✔️</td>
<td>WHEADON-ADMIN</td>
</tr>
<tr>
<td>Hemo AVF vs Graft</td>
<td>Hemodialysis Access</td>
<td>01/07/2016</td>
<td>06/24/2016</td>
<td>✔️</td>
<td>✔️</td>
<td>WHEADON-ADMIN</td>
</tr>
<tr>
<td>Major Amputations Requiring Revision Prior to Discharge</td>
<td>Lower Extremity Amputation</td>
<td>01/11/2016</td>
<td>06/15/2016</td>
<td>✔️</td>
<td>✔️</td>
<td>WHEADON-ADMIN</td>
</tr>
<tr>
<td>Major Complications for Supra Bypass Origin at the Aorta</td>
<td>Suprainguinal Bypass</td>
<td>06/09/2016</td>
<td>06/24/2016</td>
<td>✔️</td>
<td>✔️</td>
<td>WHEADON-ADMIN</td>
</tr>
<tr>
<td>Major Complications for Supra Bypass Origin at the Axillary</td>
<td>Suprainguinal Bypass</td>
<td>06/10/2016</td>
<td>06/24/2016</td>
<td>✔️</td>
<td>✔️</td>
<td>WHEADON-ADMIN</td>
</tr>
<tr>
<td>Major Complications for Supra Bypass Origin at the Femoral</td>
<td>Suprainguinal Bypass</td>
<td>06/10/2016</td>
<td>06/24/2016</td>
<td>✔️</td>
<td>✔️</td>
<td>WHEADON-ADMIN</td>
</tr>
<tr>
<td>Major Complications for Supra Bypass Origin at the Iliac</td>
<td>Suprainguinal Bypass</td>
<td>06/10/2016</td>
<td>06/24/2016</td>
<td>✔️</td>
<td>✔️</td>
<td>WHEADON-ADMIN</td>
</tr>
<tr>
<td>Procedures with Both Statin and Antithrombotic Agents Prescribed at Discharge</td>
<td>Common Variables</td>
<td>03/22/2016</td>
<td>06/15/2016</td>
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<td>Supra Graft Complications Aorta Origin</td>
<td>Suprainguinal Bypass</td>
<td>06/09/2016</td>
<td>06/24/2016</td>
<td>✔️</td>
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<td>Supra Graft Complications Axillary Origin</td>
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<td>06/09/2016</td>
<td>06/24/2016</td>
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<td>06/09/2016</td>
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#### My Saved Reports:

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<thead>
<tr>
<th>Report Name</th>
<th>Type</th>
<th>Created on</th>
<th>Updated on</th>
<th>Shared</th>
<th>Retired</th>
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<tr>
<td>CEA LOS</td>
<td>Cardiac Endarterectomy</td>
<td>01/11/2016</td>
<td>08/10/2016</td>
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<td>✔️</td>
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<td>PVI ABI/TBI</td>
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<td>03/29/2016</td>
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### Shared Reports – What’s Available?

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<tr>
<td>CAS Post Op Complications</td>
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<tr>
<td>Elective TEVAR Aneurysm for All Complications Except Death</td>
<td>TEVAR</td>
</tr>
<tr>
<td>Hemodialysis AVF vs Graft</td>
<td>Hemo</td>
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<tr>
<td>Major Amputations Requiring Revision Prior to Discharge</td>
<td>LEA</td>
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<tr>
<td>Major Complications for Supra Bypass Origin at the Aorta</td>
<td>Supra</td>
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<tr>
<td>Major Complications for Supra Bypass Origin at the Axillary</td>
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<td>Major Complications for Supra Bypass Origin at the Femoral</td>
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<tr>
<td>Major Complications for Supra Bypass Origin at the Iliac</td>
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<tr>
<td>Procedures with Both Statin and Antiplatelet Agents Prescribed at Discharge</td>
<td>CAS, CEA, EVAR, Infra, Open, PVI, Supra, TEVAR</td>
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<tr>
<td>Supra Graft Complications Aorta Origin</td>
<td>Supra</td>
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<tr>
<td>Supra Graft Complications Axillary Origin</td>
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Shared Reports – Coming Up Q4

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<tr>
<td>Elective TEVAR Aneurysm for all complications including death</td>
<td>TEVAR</td>
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<tr>
<td>ICU Days &gt;= 3 Days</td>
<td>Open, EVAR, TEVAR, Supra</td>
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<tr>
<td>Major Cardiac Event Composite</td>
<td>Open, EVAR, TEVAR, Supra, Infra</td>
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## Vascular Quality Initiative®

### Shared Reports – Modify and Save to Meet Your Needs

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<th>Report 004</th>
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<td>Procedure Type:</td>
<td>Endo AAA, Repair</td>
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Click to Save As

---

**Total Number of Procedures: N=0**

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<thead>
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<th>Variable Name</th>
<th>Tab</th>
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<td>Not Discharged Home</td>
<td>Procedure Calculated Variables</td>
<td>Patient’s standard of living has deteriorated since admission. For detailed calculation, please refer to Calculated Variables appendix in the user manual.</td>
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<tr>
<td>Post-op LOS &gt; 2 Possibility</td>
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<td>Possibility a subject will stay in hospital more than 2 days</td>
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<tr>
<td>Post-op Length of Stay</td>
<td>Procedure Calculated Variables</td>
<td>Discharge Date - Surgery Date</td>
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<tr>
<td>Post-op Length of Stay &gt; 2</td>
<td>Procedure Calculated Variables</td>
<td>Patient stayed in hospital more than 2 days</td>
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Physician-level Reporting – Choose Your View

Center or Physician?

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<thead>
<tr>
<th>Procedure Variable Name</th>
<th>My Center Results (N=106)</th>
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<td><strong>Arterial Dissection</strong></td>
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</tr>
<tr>
<td>No</td>
<td>69.0% (89)</td>
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<tr>
<td>Iliac</td>
<td>1.0% (1)</td>
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<tr>
<td>Fem-pop</td>
<td>6.0% (6)</td>
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<tr>
<td>Tibial</td>
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</tr>
<tr>
<td>Missing Value or N/A</td>
<td>4.0% (4)</td>
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<tr>
<td><strong>Arterial Perforation</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>98.0% (98)</td>
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<tr>
<td>Iliac</td>
<td>0.0% (0)</td>
</tr>
<tr>
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<tr>
<td>Tibial</td>
<td>0.0% (0)</td>
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<tr>
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<tr>
<td><strong>Distal Embolization</strong></td>
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<tr>
<td>No</td>
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<tr>
<td>Minor</td>
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Physician-level Reporting – Selecting included Physician(s)

Select from Dropdown
### Physician-level Reporting

**Report 1001**  
**Procedure Type:** Peripheral Vascular Intervention  
**View:** Center, Physician, Selected Physicians

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<tr>
<th>Procedure Variable Name</th>
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<th>Nicolette McDermott (N=1)</th>
<th>Hiram Kautzer (N=1)</th>
<th>Reynold Langworth (N=9)</th>
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<tr>
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<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>100.0% (1)</td>
<td>100.0% (1)</td>
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<td>100.0% (9)</td>
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Release Order

- Shared Reporting (released)
- Drill Down (released)
- Physician-level Reporting Q4
- Modifying common variables – can be common across tabs Q4
EMR Integration Status Updates

- Integration for Varicose Vein procedure form
  - Released and officially certified 2 vendors
    - Medstreaming
    - Mtuitive
- Integration for PVI procedure form
  - Planned to be available in Q4 2016
- Integration for procedure forms of other registries
  - Planned to be available in 2017
- Integration for follow-up forms
  - Planned to be available in 2017
Lombard Aorfix Surveillance Project

- Enrolling patients and sites!
- Enrollment target: 234 patients
  - Enrollment to date: 38 patients
- Custom content
  - Datafields: ~ 10 fields
  - Timepoints: 30d, annually through 5 yrs
  - Other: Send images to Core Lab

Contact the Project Managers at AorfixProject@m2s.com for more information
TEVAR Surveillance Project

- Longest running VQI Surveillance project
- Two cohorts
  - 5 year cohort is fully enrolled
  - 1 year cohort – enrollment is in progress
- The earliest patients are reaching the 3-year timepoint
- The FDA is very enthusiastic about using registries for post-market surveillance quality improvement projects

Contact the Project Managers at TEVARProject@m2s.com for more information
CREST 2 Registry Project

- CAS Registry with Supplemental 1-page form
- Enrolling
- 64 Physicians are participating through VQI
- Objectives
  - Promote rapid initiation and completion of enrollment in the CREST-2 trial
  - Ensure that CAS is performed by adequately experienced operators within CREST-2 and C2R
  - Closely monitor clinical outcomes of C2R patients
  - Prevent inappropriate use of CAS outside of C2R
- C2R Investigators have received 10 reports
  - Patient-level data is non-identifiable per HIPAA
  - Physician and center names are transferred IAW project data sharing agreement
Bard Peripheral Vascular LifeStent

• Bard has recently partnered with the VQI for a post approval project for the LifeStent® Vascular Stent System.

• Invitations sent

• Patients: 74 patients

• Timepoints: Procedure, 1 yr, 2 yr
  – Less than 5 custom VQI content
  – Images sent to Imaging CoreLab at 1 yr. and 2 yr. if specific Adverse Events are reported
2016 QCDR Program

• A QCDR is a CMS-approved entity that collects medical and/or clinical data for the purpose of patient and disease tracking to foster improvement in the quality of care provided to patients.

• Individual EPs who satisfactorily participate in 2016 PQRS through a QCDR may avoid the 2018 negative payment adjustment.

Additional information can be found by emailing:
psupport@m2s.com

26 Measures Available in 2016

• To successfully participate:
  – 9 measures
  – across 3 domains
  – 2 outcome measures
  – reporting rate > 50%
    Medicare patients
  – 2015 procedures must be followed up by 12/31/2016
Email Deliverability

Have you experienced problems receiving our email newsletters or PATHWAYS updates? Contact us at vqi@m2s.com if you are not receiving emails from the VQI or PATHWAYS.

Types of emails we are currently sending:
• VQI Pulse eNewsletter
• PATHWAYS product updates
• VQI Registry news
• Webinar events
• and much more!
The VQI is celebrating its Anniversary!

5 YEARS

12 CLINICAL REGISTRIES

OVER 290,000 PROCEDURES

3,000 Physicians

Over 375 Participating Centers
New VQI Customers (Nov 18th)
Give us a chance to show you the power of your data.

Choose FIVE or more registries and your site will save $2,500 off your first year!

Current VQI Customer (Dec 31st)
Thank you for playing such a big role in our success.

Add an additional VQI registry to your package, and receive a one-time $500 credit, per site, at the time of renewal.
Research Advisory Committee for the Vascular Study Group of New England (VSGNE)
Research Advisory Committee

• The Research Advisory Committee (RAC) consists of VSGNE members appointed by the Medical Director with approval of the Executive Committee.

• The RAC functions in an advisory capacity to the Executive Committee.

• Members of the RAC are selected based on an interest and expertise in the planning, design, conduct, interpretation, and presentation of analytic projects involving data collected by VSGNE.
Goal

To facilitate the conduct of quality improvement research by VSGNE members
Request to VSGNE Research Advisory Committee for Non-Identifiable Dataset
Send to mmathy@vascularsociety.org

Name of Requesting Investigator:
Email Address:
Project Name:
Date of Request:

Context and Research Question (4-5 sentence summary that will be distributed to each center for approval):

Non-identifiable dataset(s) being requested (includes follow up data):

☐ Carotid Endarterectomy
☐ Carotid Artery Stent
☐ Open AAA Repair
☐ Endovascular AAA
☐ TEVAR/Complex EVAR

Year(s) for which data are requested:

Blinded center-specific data needed: No ☐ Yes ☐ If yes, explain how/why this will be analyzed:

Blinded surgeon-specific data needed: No ☐ Yes ☐ If yes, explain how/why this will be analyzed:

Inclusion/exclusion criteria: (list variables to be used. e.g., age < 80 years)

Exposure variable(s): (e.g., asymptomatic carotid stenosis)

Outcome variable(s): (e.g., in-hospital stroke after CEA)

Mock Tables: These tables will help the RAC evaluate your research plan. Please include, for instance, the key patient characteristics (in rows) by your primary exposure (in columns), e.g. the usual Table 1 in a manuscript. Please also include a table displaying your main outcome measures (in rows) by your primary exposure variable (in columns).
RAC Timeline

• Submission -> Initial Recommendation to Executive Committee (within 4 weeks)

• Review by Executive Committee with response to the investigator (within 2 weeks)
<table>
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<tr>
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<th>Center</th>
<th>Title</th>
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<tbody>
<tr>
<td>Jeff Kalish</td>
<td>BMC</td>
<td>Wound Infection following LEB</td>
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<td>The Significance of Intra-Operative Completion Studies following LEB</td>
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<td>Clopidogrel is Not Associated with Major Bleeding Complications During Peripheral Arterial Surgery</td>
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<td>Impact of RBC Transfusion on Post-Op Outcomes in AAA</td>
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<td>Outcomes of lower extremity bypass performed for acute limb ischemia</td>
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<td>Marc Schermerhorn</td>
<td>BIDMC</td>
<td>Treatment of patients with restenosis after CEA: Redo-CEA vs. CAS</td>
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<tr>
<td>Marc Schermerhorn</td>
<td>BIDMC</td>
<td>Predictors of Type II Endoleak and their Association with Adverse Outcomes</td>
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<tr>
<td>Daniel Bertges</td>
<td>FAHC</td>
<td>Development and validation of the Vascular Quality Initiative Cardiac Risk Calculator</td>
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<tr>
<td>Primary Investigator</td>
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<td>Title</td>
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<tr>
<td>Daniel Bertges</td>
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<td>Impact of Gender on Outcomes of Peripheral Vascular Interventions</td>
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<td>Impact of Cardiac Dysrhythmias and Congestive Heart Failure on Mortality after Vascular</td>
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<tr>
<td>Andrew Stanley</td>
<td>FAHC</td>
<td>Creating a bedside tool integrating hospital cost in clinical decision analysis.</td>
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<tr>
<td>Mohammad H. Eslami</td>
<td>BMC</td>
<td>Comparison of outcomes after popliteal artery repair: comparison of open vs. endovascular repair.</td>
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<tr>
<td>V. Patel, Todd Lancaster</td>
<td>MGH</td>
<td>Predictors of postoperative renal dysfunction and its impact on peri-operative and late survival</td>
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<tr>
<td>V. Patel, Mark Conrad</td>
<td>MGH</td>
<td>Predictors and impact of aneurysm sac behavior following EVAR for AAA</td>
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<td>Marc Schermerhorn</td>
<td>BIDMC</td>
<td>Regional Differences in AAA Management</td>
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<tr>
<td>Phil Goodney</td>
<td>DHMC</td>
<td>Comparative effect of symptom status on perioperative stroke following carotid revascularization between the SVS Vascular Registry and the VSGNE</td>
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<td>Jeffery Siracuse</td>
<td>BMC</td>
<td>Comparative effectiveness of endovascular versus open repair of abdominal aortic aneurysms in low risk patients.</td>
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<tr>
<td>Mohammad H. Eslami &amp; Carla Moreira</td>
<td>BMC</td>
<td>Outcomes of lower extremity bypass with “challenged” conduits</td>
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<tr>
<td>Elicia Inagaki, Namoi Hamburg &amp; Alik Farber</td>
<td>BMC</td>
<td>Clinical outcomes of peripheral vascular intervention performed for acute limb ischemia of the lower extremities</td>
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<tr>
<td>Devin S. Zarkowsky</td>
<td>DHMC</td>
<td>Outcomes and Factors Associated with Patients Requiring Dialysis After EVAR</td>
</tr>
</tbody>
</table>

120 Research Proposals Approved by the VSGNE RAC
1. Perioperative and long-term impact of chronic kidney disease on carotid artery interventions.
   Similar articles

2. Incidence of and risk factors for bowel ischemia after abdominal aortic aneurysm repair.
   Similar articles

   Similar articles

Questions ???
Opportunities for Quality Improvement

• Anywhere there is variation in practice...
Opportunities for Quality Improvement

• Ongoing challenges with long-term follow up

• Documentation of ABI/TBI prior to PVI

• Surgical site infection and readmission after LEB
Ranged from 40-100%
Steps to Improve

Reached out to high-performing sites:

1. What is the process by which patients get an ABI/TBI prior to PVI? (e.g., it’s obtained on a standard preop-PVI order set. Or, it’s a routine part of a New Patient clinic visit. Etc.)

2. Where do the data managers go to find this information? (e.g., clinic notes, or Noninvasive Lab reports, etc)

3. Has this process evolved over time in order to improve rates up the 100% that they are currently?
Uniform Answers

- Routine part of evaluation
- Readily available in EMR
- Responsibility of MD, with double-check by data managers
Vascular Quality Initiative®

Action Plan at UMass

- Reviewed where this documentation exists in the absence of EMR
- Worked with data manager
- Reminded faculty that this is an important part of practice and documentation
Run Chart

Rate of ABI/TBI Reporting by Month of Surgery

Rate of ABI/TBI Reported

N= 4 3 10 8 4 3 1 4 10 6 11 7 6 6 9 12 10 2

Run Chart

Rate of ABI/TBI Reporting by Month of Surgery

- March 2015: 30%
- April 2015: 40%
- May 2015: 60%
- June 2015: 80%
- July 2015: 90%
- August 2015: 100%
- September 2015: 90%
- October 2015: 80%
- November 2015: 60%
- December 2015: 40%
- January 2016: 50%
- February 2016: 70%
- March 2016: 90%
- April 2016: 100%
- May 2016: 90%
- June 2016: 80%
- July 2016: 60%
- August 2016: 40%
Vascular Quality Initiative®

Other Ways to Use VSGNE for Quality Improvement

• Surgical Site Infection and Readmission after LEB

• Pilot collection (30d outcomes) a few years ago:
  – 29,521 completed INFRA procedures
  – 5920 procedures with 30-Day follow-up(s) (6177 records)
## Vascular Quality Initiative®

**5920 procedures**

**6177 follow up records**

<table>
<thead>
<tr>
<th></th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readmission</td>
<td>593 (10)</td>
</tr>
<tr>
<td>Surgical Site Infection</td>
<td>291 (5)</td>
</tr>
<tr>
<td>Readmission AND Surgical Site Infection</td>
<td>330 (6)</td>
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</tbody>
</table>
Next Steps

• Resumed collection of this data at UMass (April 2016)

• Planning/implementation phases of efforts to reduce SSI (preop CHG shower, practice change for identifying/treating MRSA colonization)

• Will track progress with run charts, using VSGNE data
Other Committee-Sponsored QI Initiatives

• Atherectomy – VSGNE data obtained to analyze variations in practice patterns; VQI RAC proposal underway

• AV Access – VSGNE and VQI data obtained to analyze predictors of early complications
  – Opportunity to work with K Woo/HD Module Workgroup on module revision
Other Interests?

Questions?

contact info:

jessica.simons@umassmemorial.org

774-261-3868
Early Revascularization versus Conservative Management in Asymptomatic Carotid Stenosis: A Propensity Based Analysis

Jesse A. Columbo; Philip P. Goodney
Dartmouth-Hitchcock Medical Center

Vascular Study Group of New England
November 11th, 2016
Institutional Differences in Carotid Artery Duplex Diagnostic Criteria Result in Significant Variability in Classification of Carotid Artery Stenoses and Likely Lead to Disparities in Care

Edward J. Arous, MD; Donald T. Baril, MD; William P. Robinson, MD; Francesco A. Aiello, MD; Nathanael D. Hevelone, MPH; Elias J Arous, MD; Louis M. Messina, MD; Andres Schanzer, MD

Background—The indications for carotid revascularization are based almost exclusively on the results of carotid duplex ultrasonography. Noninvasive vascular laboratories show large variation in the diagnostic criteria used to classify degree of carotid artery stenosis. We hypothesize that variability of these diagnostic criteria causes significant variation in stenosis classification directly affecting the number of revascularizations and associated costs.

Methods and Results—The diagnostic criteria to interpret carotid duplex ultrasounds were obtained from 10 New England institutions. All carotid duplex scans performed at our institution were reviewed from 2008 to 2012. Using the diagnostic criteria from each institution, the degree of stenosis that would have been reported was classified as 70% to 99% asymptomatic, 80% to 99% asymptomatic, and 50% to 99% symptomatic. We then calculated the theoretical number of carotid revascularization procedures that this cohort would be offered using each institution’s diagnostic criteria and the costs of these procedures based on reimbursement rates. Among 10,614 patients who underwent 15,534 carotid duplex scans, 31,025 arteries were reviewed. Application of the 10 institutions’ criteria to the patients from our institution yielded marked variation in the number classified as 70% to 99% asymptomatic (range, 186–2201), 80% to 99% asymptomatic (range, 78–426), and 50% to 99% symptomatic (range, 157–781). If revascularizations were based on these results, costs would range from $2.2 to $26 million, $0.9 to $5.0 million, and $1.9 to $9.2 million, respectively.

Conclusions—Differences in diagnostic criteria to interpret carotid ultrasound result in significant variation in classification of carotid artery stenosis, likely leading to differences in the number and subsequent costs of revascularizations. This theoretical model highlights the need for standardization of carotid duplex criteria. (Circ Cardiovasc Qual Outcomes. 2014;7:423-429.)
Operations Based on Institutional Carotid Duplex Criteria (Arous et al)

- Dartmouth criteria for ≥80% stenosis:
  - ICA PSV ≥430 cm/s
  - ICA EDV ≥151 cm/s
  - ICA:CCA ≥7.5
Carotid Duplex Thresholds for Surgery

Internal Carotid Peak Systolic Velocity

- No Surgery if Asymptomatic
- Surgery Variable by Institution
- Surgery at Dartmouth

Centimeters per second

100
200
300
400
500

430 cm/sec
230 cm/sec
Freedom From Any-Cause Stroke

Stroke due to any cause: n=16 of 327 patients

- Major: n=10
- Minor: n=2

Management:
- Medical n=15
- CEA n=1
Propensity Analysis

Asymptomatic Carotid Stenosis

DHMC
Conservative
Duplex Criteria
Cohort

VQI
Revascularization
Cohort

Propensity Score Matching

n=327

1:4 matching

Propensity Score Matched Cohort

Clinical Outcomes Comparison
## Table I. Mock Cohort Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Conservative Duplex Patients, n= (%)</th>
<th>Revascularized Patients, n= (%)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD 8.5)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
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<tr>
<td>Coronary Artery Disease</td>
<td></td>
<td></td>
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<tr>
<td>Congestive Heart Failure</td>
<td></td>
<td></td>
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<tr>
<td>COPD</td>
<td></td>
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<tr>
<td>CKD</td>
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<tr>
<td>Diabetes</td>
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<tr>
<td>Smoking</td>
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<tr>
<td>Active Smoking</td>
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<tr>
<td>Antiplatelet</td>
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<tr>
<td>Dual Antiplatelet</td>
<td></td>
<td></td>
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<tr>
<td>Statin</td>
<td></td>
<td></td>
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<tr>
<td>Contralateral Severe Stenosis</td>
<td></td>
<td></td>
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<tr>
<td>Contralateral Occlusion</td>
<td></td>
<td></td>
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<tr>
<td>Contralateral Revascularization</td>
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</table>
Table II. Mock Clinical Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Conservative Duplex Patients, n= (%)</th>
<th>Revascularized Patients, n= (%)</th>
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</thead>
<tbody>
<tr>
<td>Ipsilateral Stroke</td>
<td></td>
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<tr>
<td>Any Stroke</td>
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<tr>
<td>Heart Attack</td>
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<tr>
<td>Cranial Nerve Injury</td>
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<td></td>
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<tr>
<td>Return to Operating Room</td>
<td></td>
<td></td>
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<tr>
<td>Death</td>
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Mock Figures

Stroke

Mortality
Thank You
Vascular Quality Initiative

Business Discussion:

• Review redlined bylaw changes
## Expanding Participation

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<thead>
<tr>
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<th>City</th>
<th>State</th>
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<tbody>
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<td>BRIDGETOWN</td>
<td>CT</td>
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<td>ST. VINCENT’S HOSPITAL</td>
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Release Order

• Shared Reporting (released)
• Drill Down (released)
• Physician-level Reporting Q4
• Modifying common variables – can be common across tabs Q4
Next Meeting