Research Advisory Council Update:
Adam Beck, MD

National Research Process

http://www.vascularqualityinitiative.org/vqi-resource-library/quality-research/

Approved Project List – as of 12/13/2016

- To submit a proposal to be considered for the National RAC, please follow the link below and select "PSO National RAC – MONTH Proposal Submission.

http://abstracts123.com/svs1/meetinglogin

National Research Process

Proposal Submissions

April 2017

Call for Proposals: February 14, 2017
Due Date: Midnight March 27, 2017
Meeting: April 10, 2017
Notification Sent: April 11, 2017

June 2017 – Dates Subject to Change

Call for Proposals: April 11, 2017
Due Date: May 29, 2017
Meeting: June 12, 2017
Notifications Sent: June 13, 2017

Arterial Quality Council Update:
Adam Beck, MD

VQI Committee Activities – Arterial Quality Committee

The Arterial Quality Committee (AQC) discussed term limits and succession planning for VQI Registry Chairs and Vice Chairs and recommended:

- Three year terms renewable every year for one year
- The Vice Chair should be prepared to accept the Chair position when the Chair steps down
- The Chair can rejoin the committee after stepping down
- The AQC Chair has the right to ask a Chair or Vice Chair to step down if the Registry Chair or Vice Chair is unable to fully participate

Registry Chairs were requested to examine existing research projects to help identify two to three quality improvement projects that may lead to best practice recommendations for procedures included in each Registry.

Implementation of National QI Projects:

- **Three VQI committees** working on the National QI project rollout of improving discharge medication and EVAR LTFU imaging rates.
- Provide physician specific reports and COPI reports for discussion at regional meetings
- Identify high performing centers
- Seek industry funding for EVAR LTFU imaging once a plan of work has been completed.
- **Publication** of National QI projects in Feb 22nd issue of *Vascular Specialist*

PSO National QI Project Committee Process

SVS PSO
- Identify high performing centers
- **Provide input to/from regional meetings**
- Develop educational resources
- Develop COPI and Physician Reports
- Align with MIPS/MACRA
- Track successes

Implementation of National QI Projects:

Later Steps

- Planned VQI publication describing outcomes of patients with and without EVAR follow-up and imaging
- Registry changes: Automatic push reports that provide centers with information on patients needing follow-up imaging
- Incorporate QI project participation as part of the Participation Awards. Inform VQI members that adding QI project participation as part of the Awards program is being considered.
- Medicare integration/query to determine if imaging is being done elsewhere, but not entered in the VQI registry.

QI Webinar
Series

Discharge Medications: Reaching and Sustaining our Goal of 100%

Presented by:

Randall R. De Martino, MD, MS

Cheryl R. Jackson, DNP, MS, RN, CPHQ

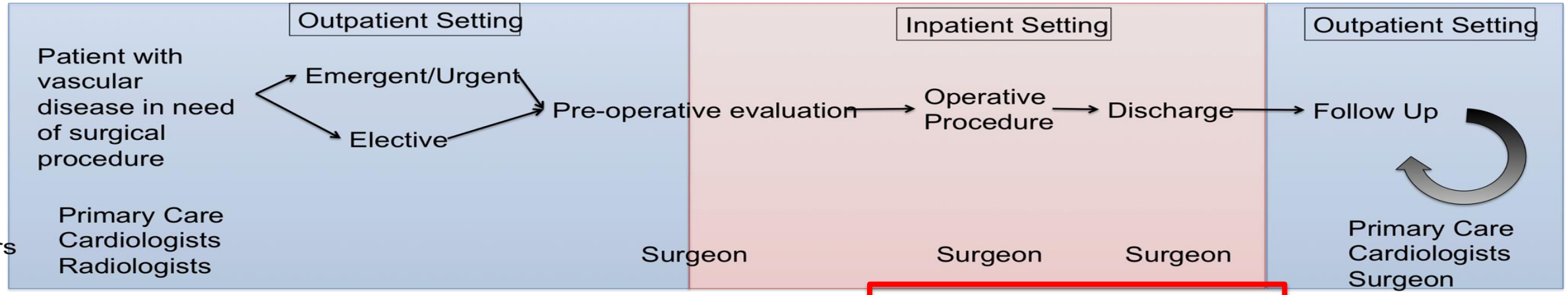
SVS | PSO
PATIENT SAFETY ORGANIZATION

Outline

- What do we mean by “Discharge Medications”?
- Why are they important?
- Medication use in VQI
- How to approach prescribing
- Tools for success

Discharge Medications

- A hospitalization is a “check-point” event
- Medication reconciliation
- Opportunity to ensure appropriate medical therapies are prescribed



Providers	Primary Care, Cardiologists, Radiologists	Surgeon	Surgeon, Surgeon	Primary Care, Cardiologists, Surgeon
Medication Prescribing by Surgeon	Less control of medications	Complete control over medications	Less control of medications
Opportunities	Medication assessment Peri-operative risk assessment	• Post Operative and Discharge Orders • Medication reconciliation • Initiate new medications • Patient education	• Reassess medication use • Provider/Patient education • Communication
Barriers	Unknown prior cardiovascular care Urgency Possible allergies	• Systems of care • Provider education • Ownership of medical management	• Multiple Providers • Ownership of medical management • Fewer return visits to surgeons • Compliance/insurance

SVS | PSO
PATIENT SAFETY ORGANIZATION

What Meds are we talking about?

- For today's discussion we will focus on 2 medications
  - Antiplatelet medications
  - Statins

Antiplatelet Medications

- Most commonly used is aspirin
- Widely available since 1899
- Available over the counter in several doses
- Other medications include clopidogrel (Plavix), prasugrel (Effient) and some others…

Statins

- HMG-CoA reductase inhibitors
- Inhibit cholesterol synthesis in the liver
- Can profoundly reduce cholesterol levels

Recommendation for Statins

QI Webinar Series

- Start Statins in all patients with

ACC/AHA Prevention Guideline

OPEN

2013 ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults

A Report of the ... /American Heart Associa... delines

Endorsed by the An... ican Association of Cardiovascular ar... acists Association, American Society for Preventi... sts, Preventive Cardiovascular Nurses Association, an... nen With Heart Disease

Patients with PAD should be initiated in a statin

Class 1A Recommendation

SVS | PSO
PATIENT SAFETY ORGANIZATION

Recommendations for AP

- Start Antiplatelet medications in all patients with

2011 ACCF/AHA Focused update of the guideline for the management of patients with peripheral artery disease (updating the 2005 guideline)

A Report of the American Heart Association Task Force on Practice Guidelines

Developed in Collaboration d Interventions, Society of Interventional Radiology, So r Surgery

Patients with PAD should be initiated on an AP medication

Class 1A Recommendation

SVS | PSO
PATIENT SAFETY ORGANIZATION

Intensity Matters

Table 5. High-, Moderate-, and Low-Intensity Statin Therapy (Used in the RCTs Reviewed by the Expert Panel)*

High-Intensity Statin Therapy	Moderate-Intensity Statin Therapy	Low-Intensity Statin Therapy
Daily dose lowers LDL-C, on average, by approximately ≥50%	Daily dose lowers LDL-C, on average, by approximately 30% to <50%	Daily dose lowers LDL-C, on average, by <30%
Atorvastatin (40†)–80 mg	**Atorvastatin 10 (*20*) mg**	*Simvastatin 10 mg*
Rosuvastatin 20 (*40*) mg	**Rosuvastatin (*5*) 10 mg**	**Pravastatin 10–20 mg**
	Simvastatin 20–40 mg‡	**Lovastatin 20 mg**
	Pravastatin 40 (*80*) mg	*Fluvastatin 20–40 mg*
	Lovastatin 40 mg	*Pitavastatin 1 mg*
	Fluvastatin XL 80 mg	
	Fluvastatin 40 mg BID	
	Pitavastatin 2–4 mg	

SVS | PSO
PATIENT SAFETY ORGANIZATION

Sonte et al. Circulation 2014

Benefits of ASA/Statin Use

- For patients with cardiovascular disease, both antiplatelets and statins are shown to reduce the risks of
  - Heart attack
  - Stroke
  - Vascular death

Medication use in VQI

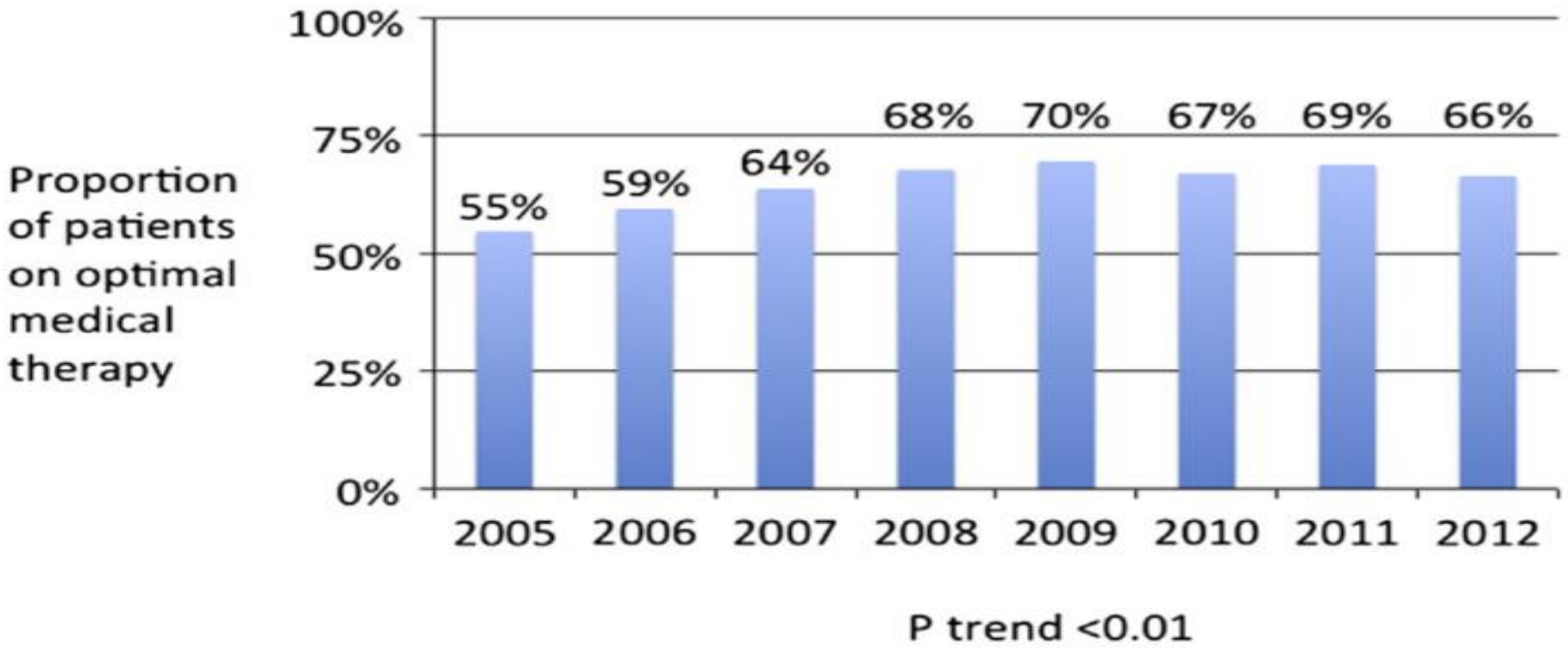
Perioperative management with antiplatelet and statin medication is associated with reduced mortality following vascular surgery

Randal MD, MS,[a]
David vett, MD,[a] and
Philip nd, *Lebanon, NH;*
Rochest

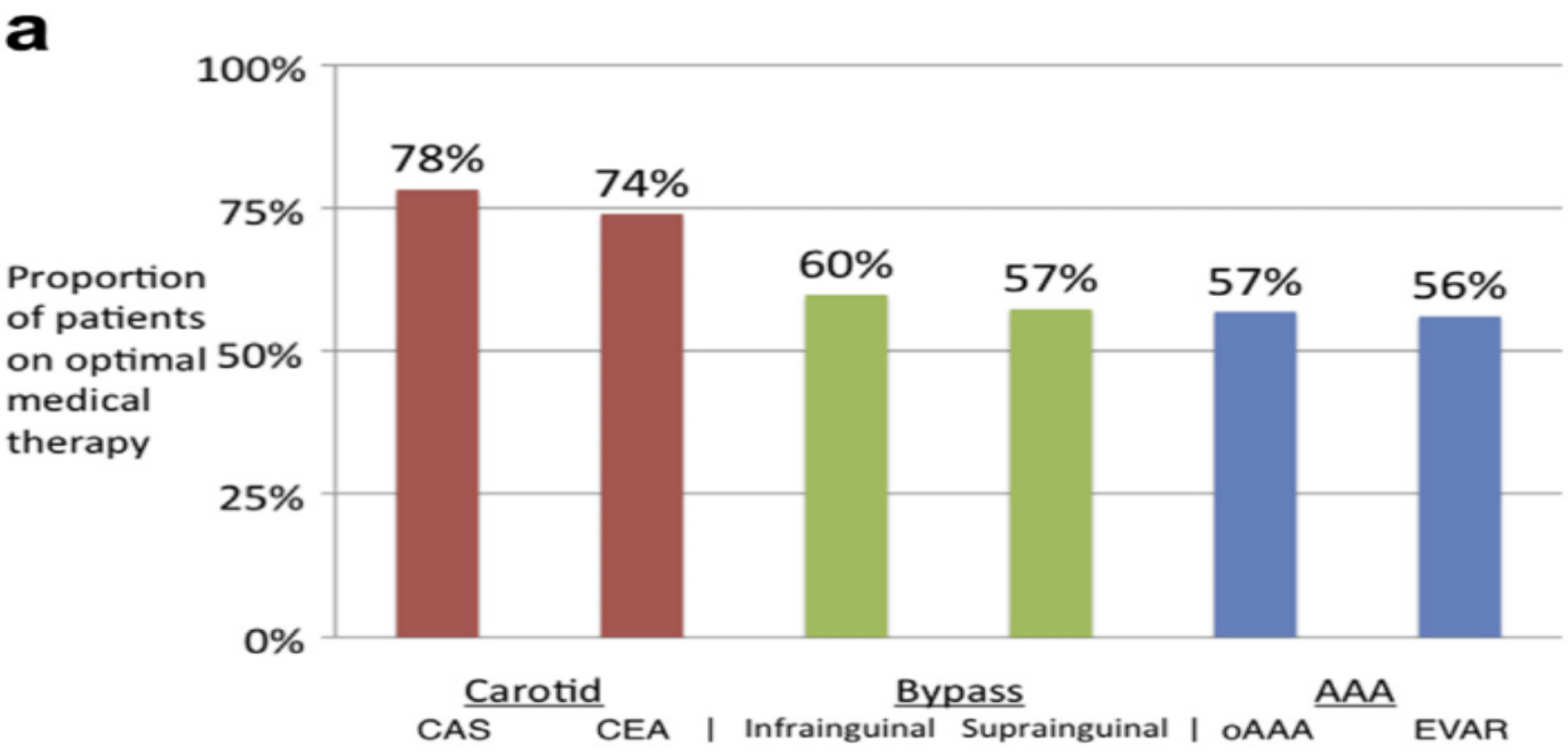
- Review of >14,000 patients in the VSGNE
- Reviewed patients undergoing:
  - CEA/CAS/AAA/LEB

SVS | PSO
PATIENT SAFETY ORGANIZATION

Preop and Discharge Medication Use

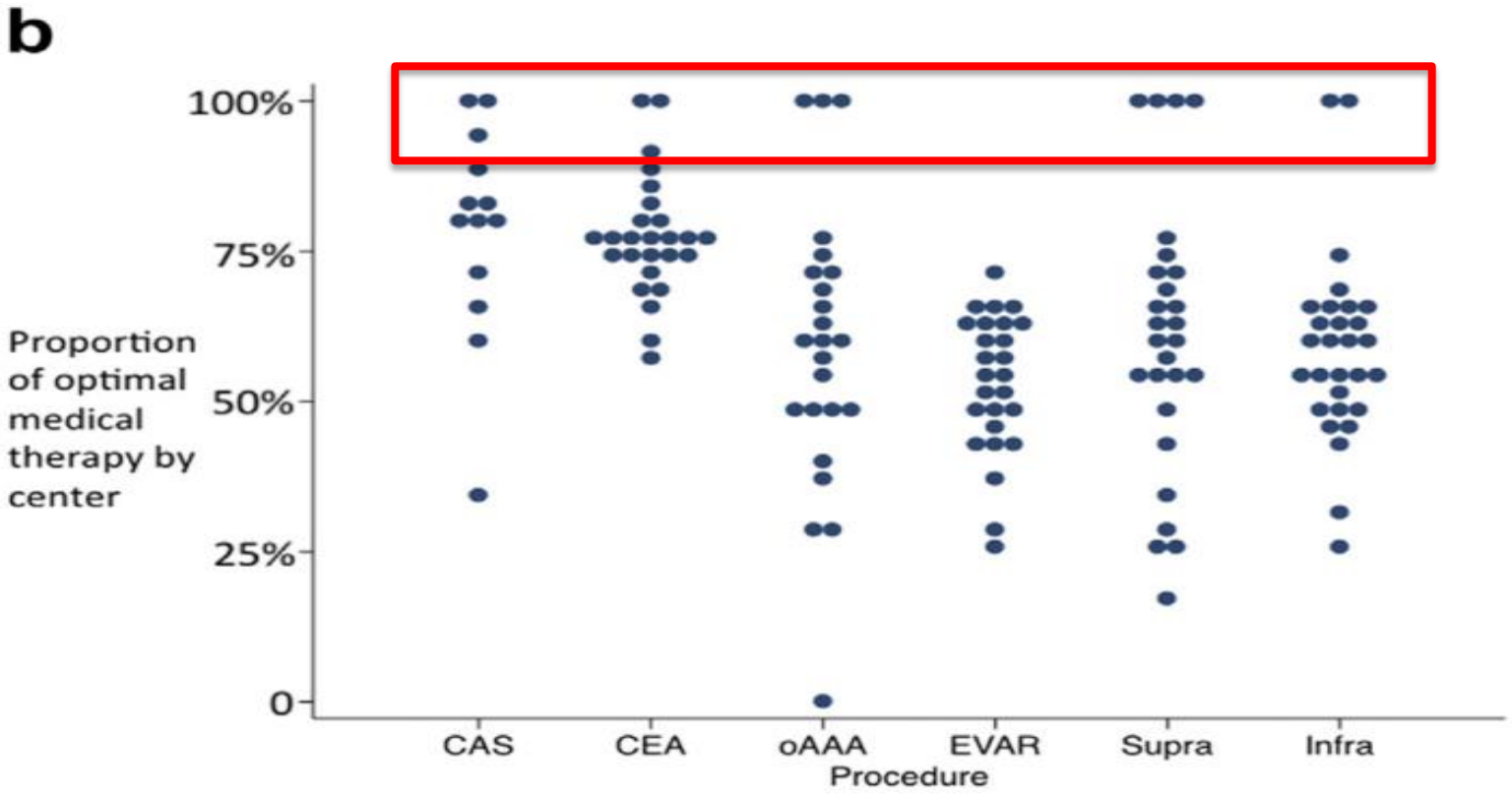


Preop and Discharge Medication Use



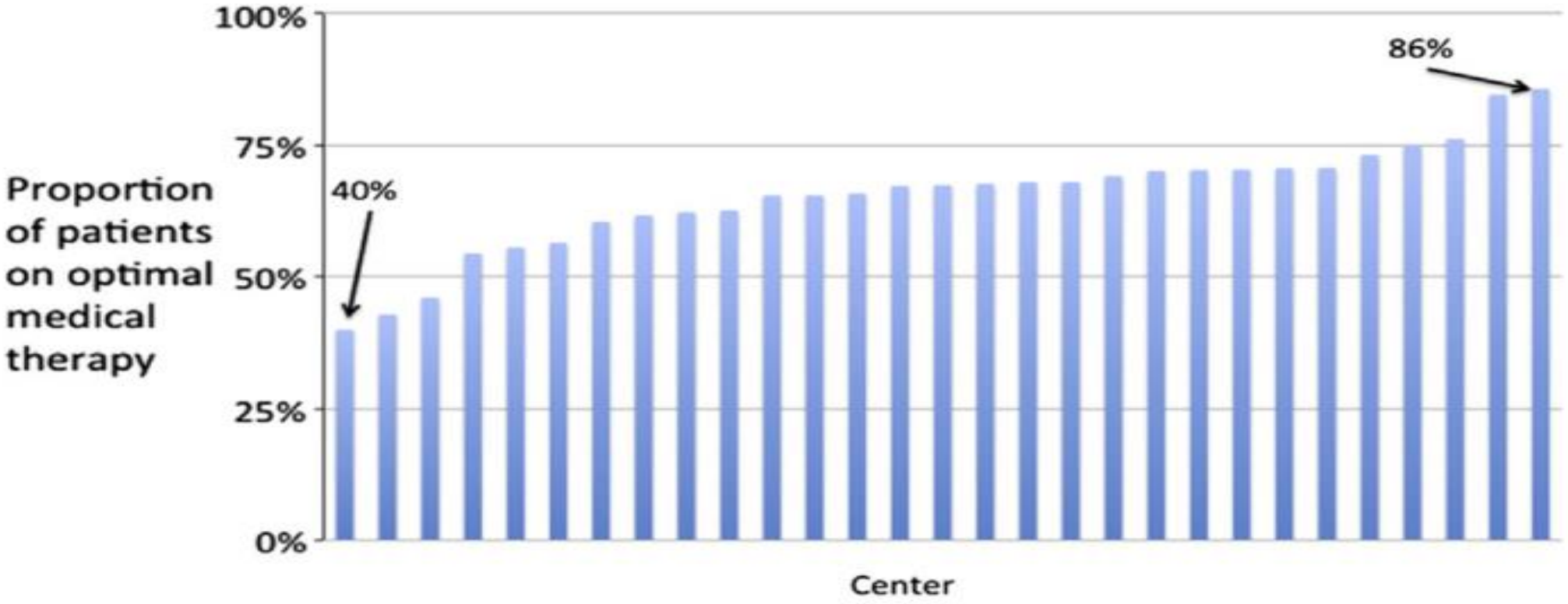
SVS | PSO
PATIENT SAFETY ORGANIZATION

Preop and Discharge Medication Use



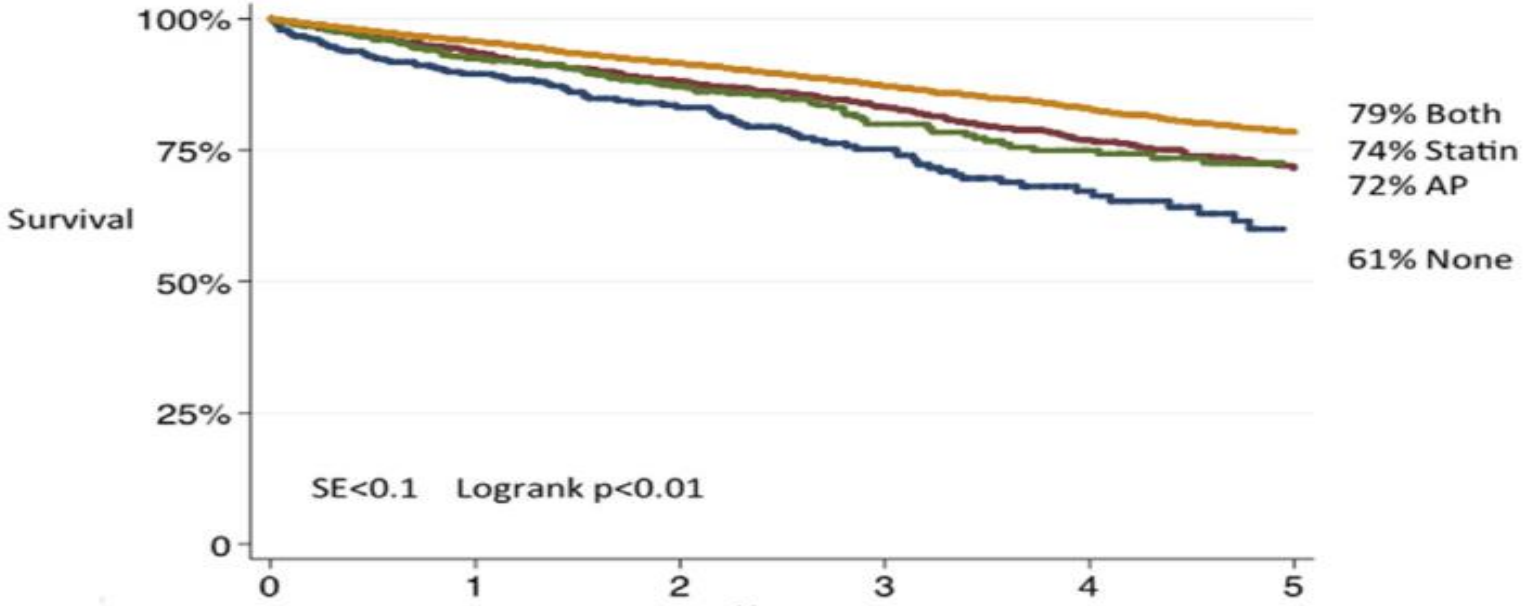
Preop and Discharge Medication Use

QI Webinar Series



SVS | PSO
PATIENT SAFETY ORGANIZATION

Preop and Discharge Medication Use



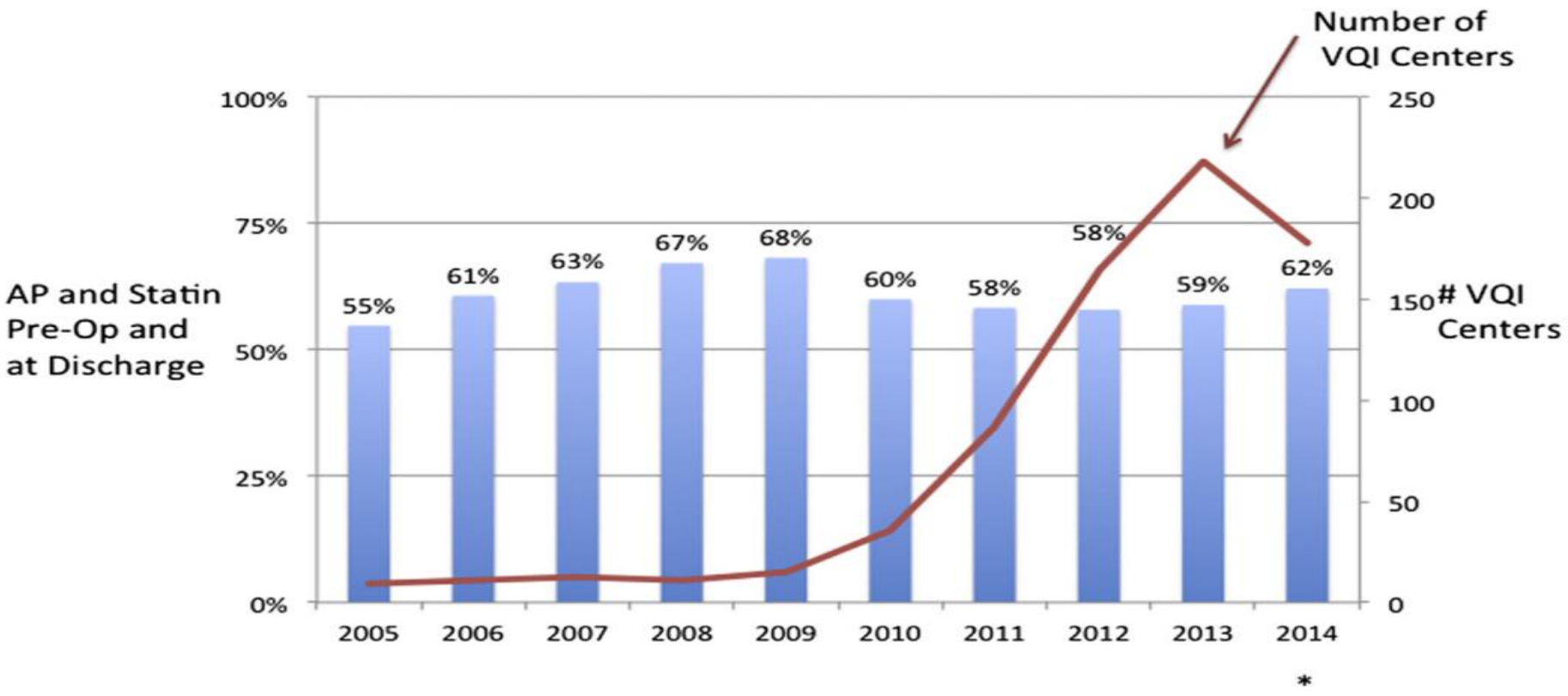
At Risk						
None	362	256	189	129	73	36
AP	1697	1307	932	680	438	175
Statin	589	399	268	171	117	49
Both	8058	5661	3549	2252	1264	490

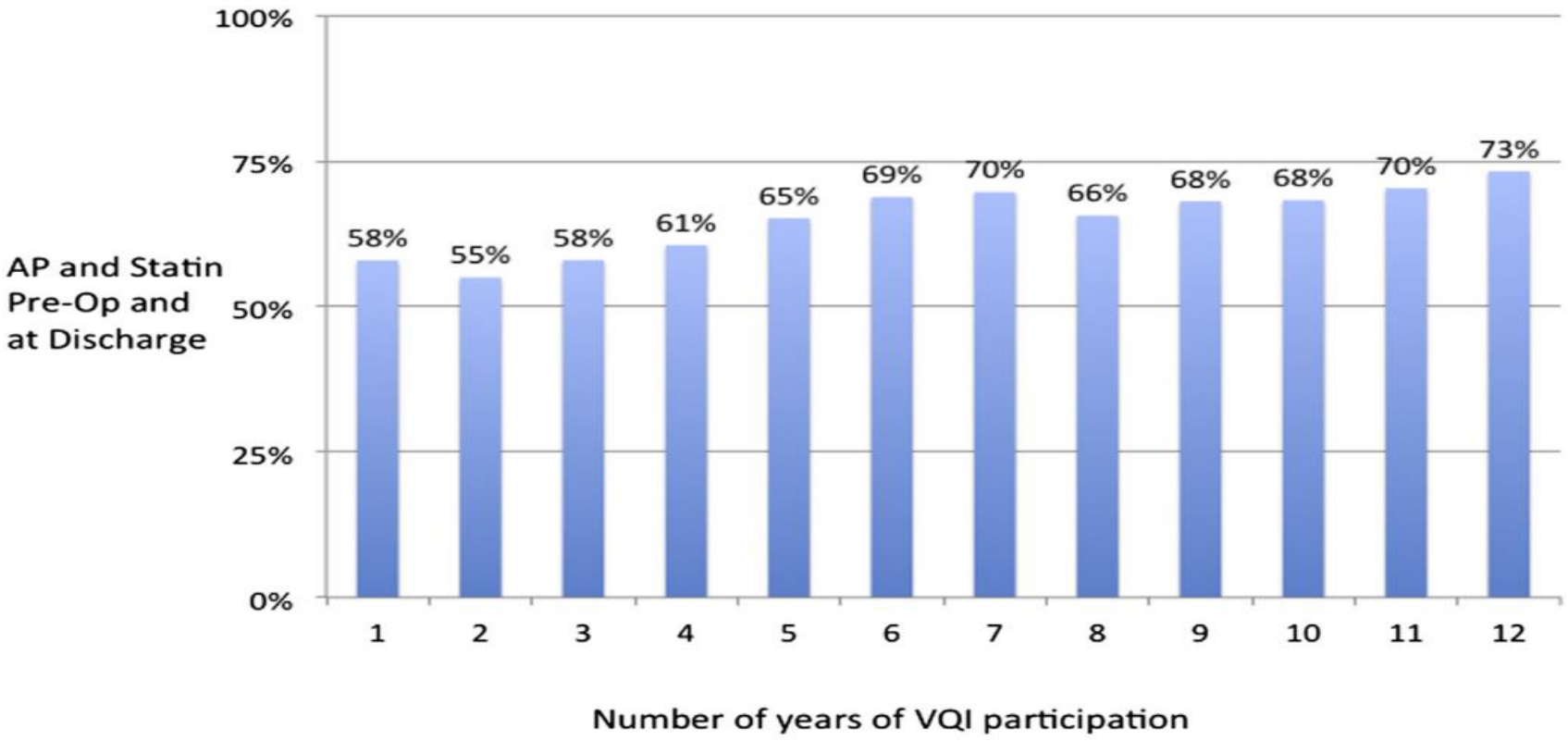
Participation in the Vascular Quality Initiative is associated with improved perioperative medication use, which is associated with longer patient survival

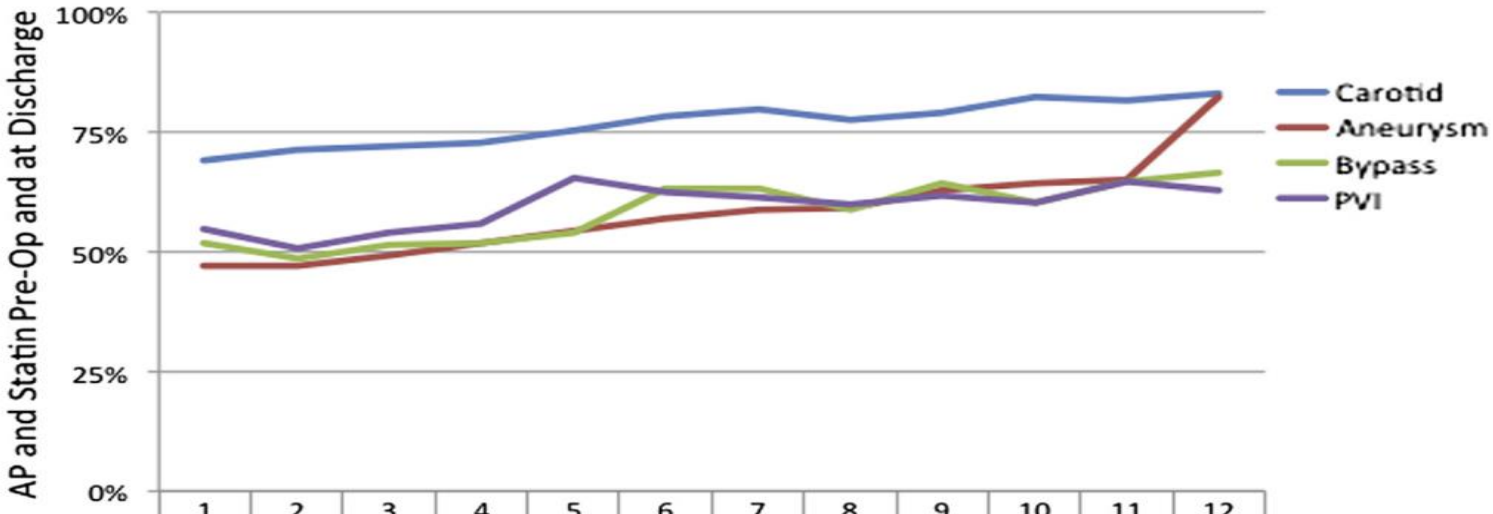
Randal -Jorgensen, MD,[d]
John W odney, MD, MS,[g]
for the Charleston, SC;
Charlo

- Follow up study using national VQI data from all centers
- >28,000 first time cases performed across centers

SVS | PSO
PATIENT SAFETY ORGANIZATION

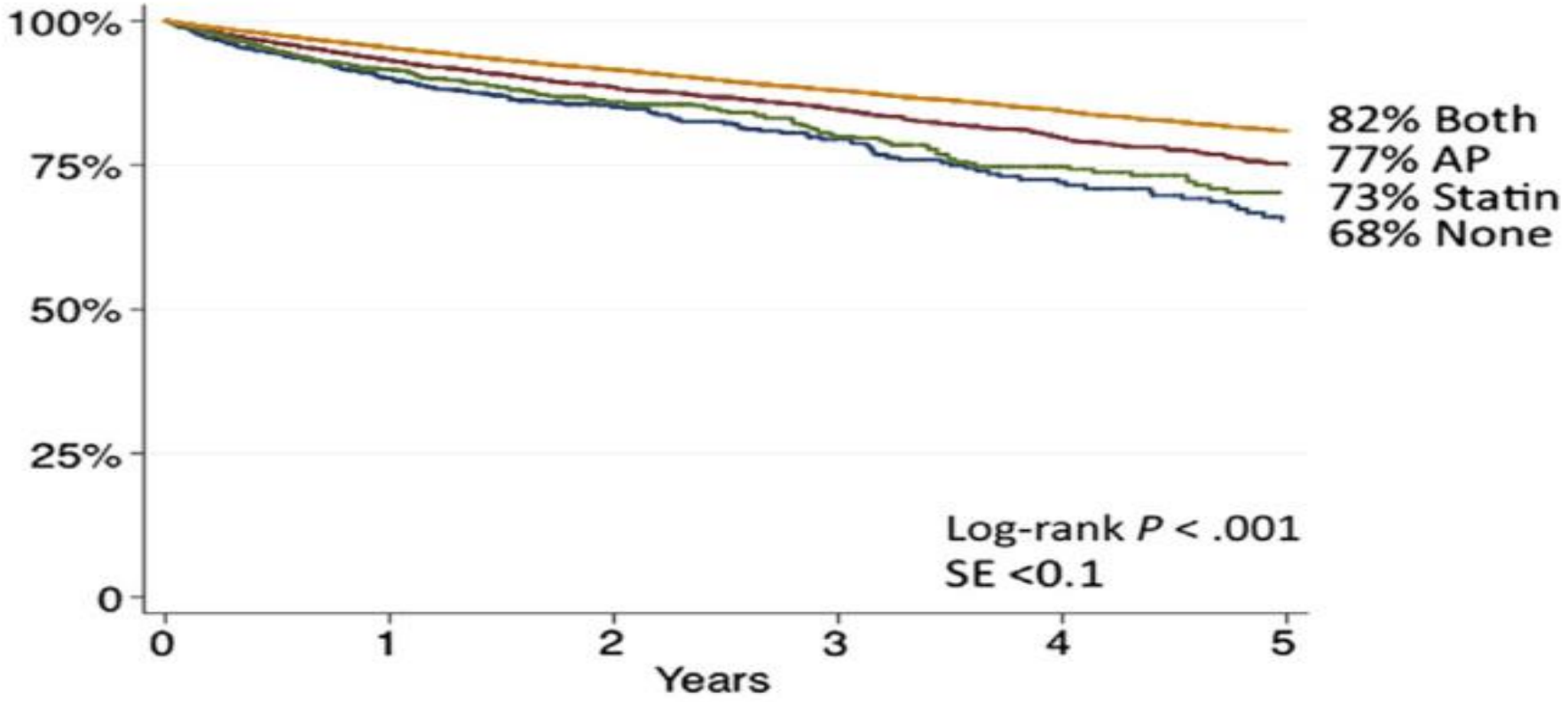

Number of
VQI Centers
AP and Statin
Pre-Op and
at Discharge
100%
75%
50%
25%
0%
250
200
150
100
50
0
VQI
Centers
55%
61%
63%
67%
68%
60%
58%
58%
59%
62%
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
*


100%
75%
50%
25%
0%
AP and Statin
Pre-Op and
at Discharge
58%
55%
58%
61%
65%
69%
70%
66%
68%
68%
70%
73%
1
2
3
4
5
6
7
8
9
10
11
12
Number of years of VQI participation



	1	2	3	4	5	6	7	8	9	10	11	12
Carotid	69%	71%	72%	73%	75%	78%	80%	78%	79%	83%	82%	83%
Aneurysm	47%	47%	49%	52%	55%	57%	59%	59%	63%	64%	65%	82%
Bypass	52%	49%	51%	52%	54%	63%	63%	59%	64%	60%	65%	67%
PVI	55%	51%	54%	56%	65%	62%	62%	60%	62%	60%	65%	63%

Number of years of VQI participation


100%
75%
50%
25%
0
0
1
2
3
4
5
Years
82% Both
77% AP
73% Statin
68% None
Log-rank P < .001
SE <0.1

- Efforts to improve medication use have been underway in the VQI for about a year

- Targeted efforts were in
  - Push reports
  - Education

Want to Improve 5-Year Survival? Check the Meds…

Antiplatelet (AP) and statin medications are an important component to treatment, but a third of eligible post-op VQI patients leave the hospital without these medications. **Those patients on AP and statins had a 14% absolute survival benefit and 40% adjusted improved survival.**

QI Webinar Series

Survival by Discharge Medications

No AP or statin | AP & Statin

- For every 25 patients treated, discharge on an antiplatelet agent and statin medication is associated with 3.5 additional patients alive at 5 years!
- VQI participation is highly associated with improvement in medication use

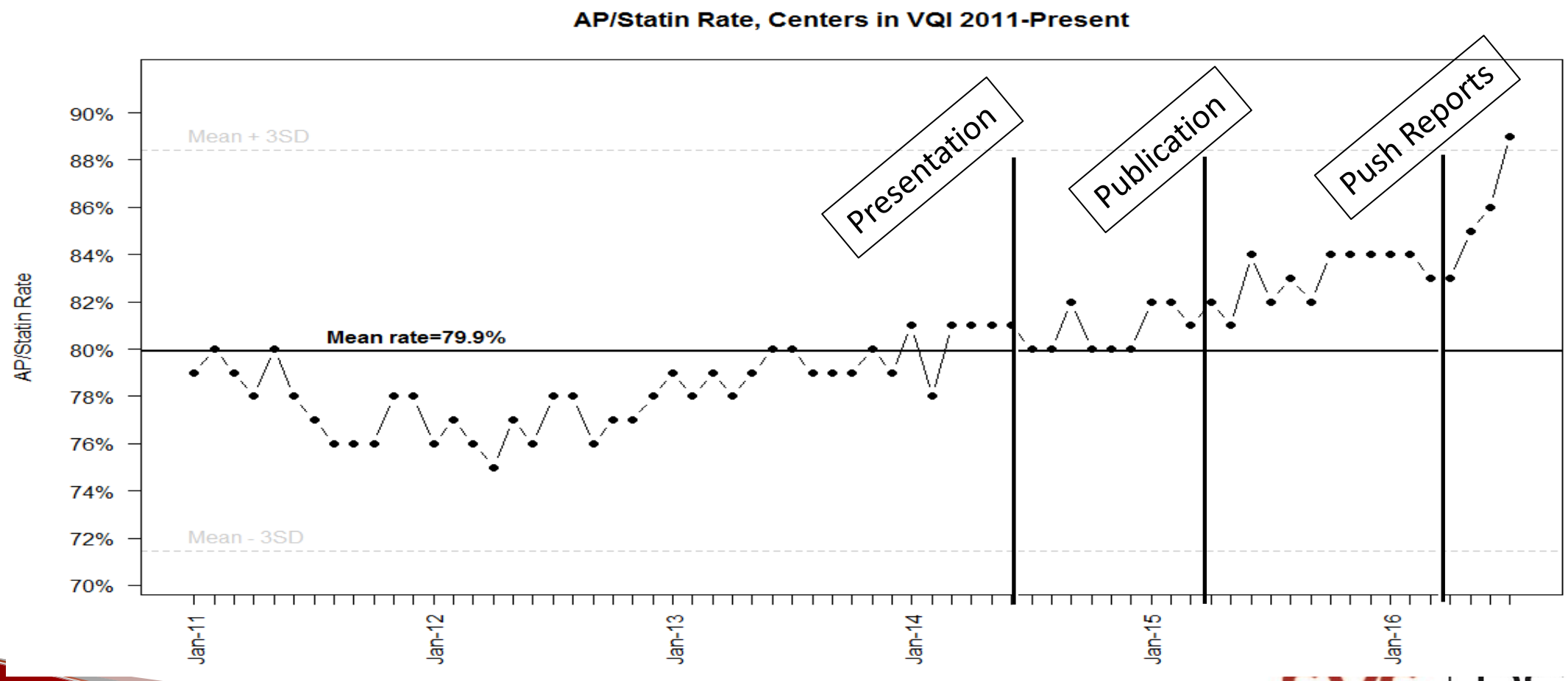
Conclusion:
Medical management is associated with improved survival after a number of vascular procedures. Importantly, VQI participation improves the use of medical management, demonstrating that involvement in an organized quality effort can affect patient outcomes.

VS | PSO
IT SAFETY ORGANIZATION

Source: De Martino RR, Hoel AW, Beck AW, Eldrup-Jorgensen J, Hallett JW, Upchurch GR, Cronenwett JL, Goodney PP; Vascular Quality Initiative. J Vasc Surg. 2015 Jan 15. pii: S0741-5214(14)02200-9. doi: 10.1016/j.jvs.2014.11.073

National QI Initiative to Increase Statin Use

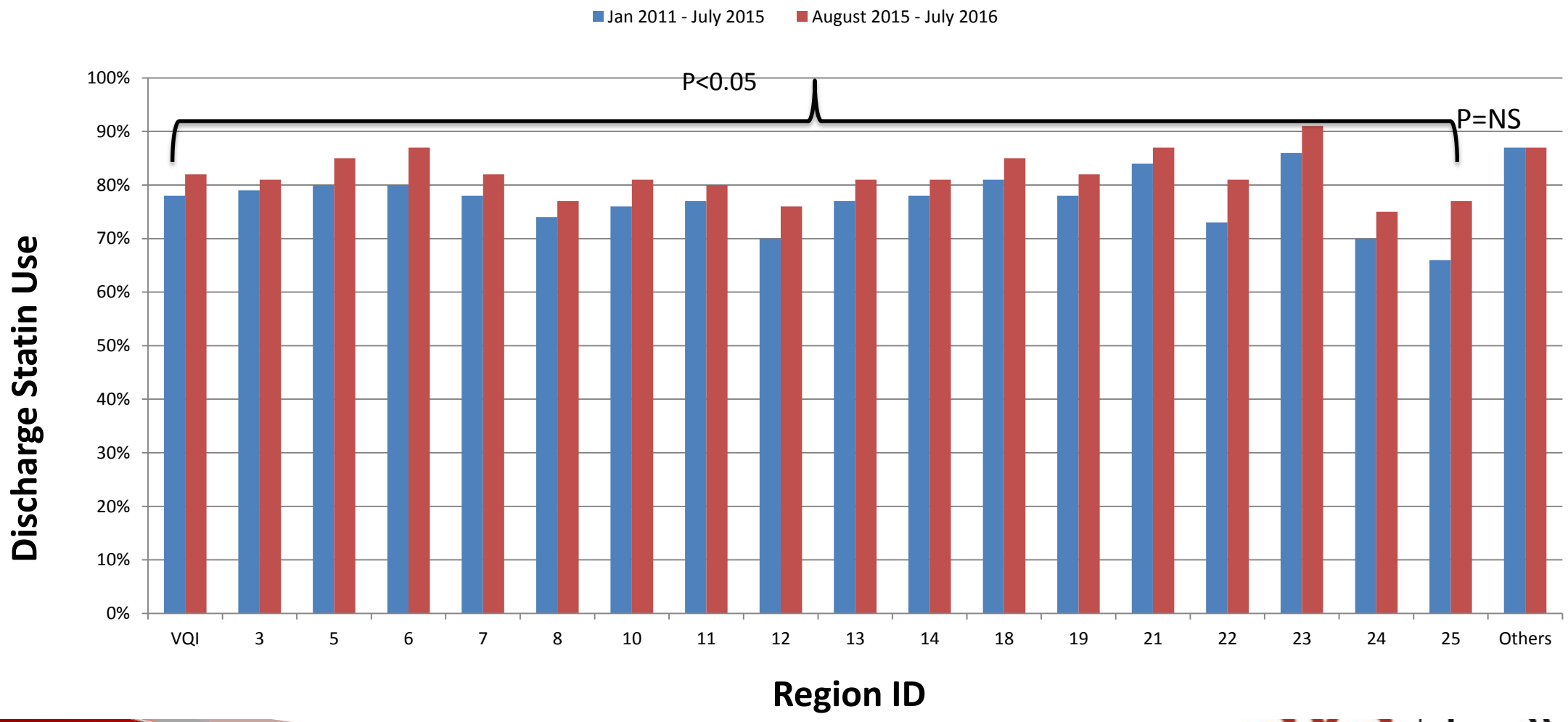
QI Webinar Series



SVS | PSO
PATIENT SAFETY ORGANIZATION

Regional Participation Is Important

QI Webinar Series



PATIENT SAFETY ORGANIZATION

Learning Points

- Not all patients are getting appropriate medical treatment before or after their vascular operation
- Some centers can reach 100%, others less so
- Type of surgery seems to impact medication use
- Medication use after surgery is associated with overall survival

Learning Points

- Length of participation in VQI appears to improve medication use
  - Participation in regional meeting may be important
  - Review of center level data is necessary
  - Processes need to be developed at each institution to make improvements

Approach to Prescribing

- Does your patient have an indication for statin use?
  - Answer for nearly all patients in VQI will be yes because they have clinically evident atherosclerotic cardiovascular disease
  - That may not apply to all patients…
    - Maybe a younger patient with vasculitis
    - Popliteal artery aneurysm, etc

Aspirin Prescribing

- Fairly simple
- Aspirin 75-325mg (typically 81mg) daily
  - To reduce the risk of MI, stroke, or vascular death
    - Level IB recommendation
  - Higher doses (325mg) have been associated with higher bleeding risks without other clinical benefit
- Clopidogrel (Plavix) is a reasonable alternative to aspirin

Rooke. J Vasc Surg 2011.

Statin Prescribing

- A tad more complex
- Statins carry the risk of
  - Muscle aches
  - Liver damage
  - Elevated blood sugar
- Start with do they need to be on a statin?

Statin Prescribing

- Baseline laboratory measurements
  - Fasting lipid panel
  - ALT
  - CK (if indicated)
- Initiate high vs intermediate does statin as indicated by guidelines
- Reassess lipid panel in 4-12 weeks
- Many reactions to medication may be mediated by reduction of dose or transition to a different statin

Uncomfortable Prescribing

- Most common reason
  - I don't manage these medications
  - Not appropriate for me to start therapy
  - PCP needs to start/monitor
  - Etc, etc

- Not a reason to skip treatment

Uncomfortable Prescribing

- Check baseline labs
- Prescribe appropriate dose statin
- Inform PCP of medication change and allow follow up

Tools available

- Data!
- Online resources through M2S

Discharge Medication Communications

As part of the QI process, vascular specialists are encouraged to communicate with primary care physicians, patients and other providers regarding the use of discharge medications.

Below please see links to sample communications currently in use within the VQI:

Risk Factor Modification

Risk Factor Modification Letter – Patient

Risk Factor Modification Letter – Physician

Sample Letters by Type of Medication (Hospital Setting)

Aspirin
Letter to Patient
Letter to Physician

ACE Inhibitor
Letter to Patient
Letter to Physician

Beta Block
Letter to Patient
Letter to Physician

Statin
Letter to Patient
Letter to Physician

Multiple Medications
Letter to Patient
Letter to Physician

Discharge Medication Communications

As part of the QI process, vascular specialists are encouraged to communicate with primary care physicians, patients and other providers regarding the use of discharge medications.

Below please see links to sample communications currently in use within the VQI:

Risk Factor Modification

Risk Factor Modification Letter – Patient

Risk Factor Modification Letter – Physician

Sample Letters by Type of Medication (Hospital Setting)

Aspirin
Letter to Patient
Letter to Physician

ACE Inhibitor
Letter to Patient
Letter to Physician

Beta Block
Letter to Patient
Letter to Physician

Statin
Letter to Patient
Letter to Physician

Multiple Medications
Letter to Patient
Letter to Physician

Discharge Medication Communications

As part of the QI process, vascular specialists are encouraged to communicate with primary care physicians, patients and other providers regarding the use of discharge medications.

Below please see links to sample communications currently in use within the VQI:

Risk Factor Modification

Risk Factor Modification Letter – Patient

Risk Factor Modification Letter – Physician

Sample Letters by Type of Medication (Hospital Setting)

Aspirin
Letter to Patient
Letter to Physician

ACE Inhibitor
Letter to Patient
Letter to Physician

Beta Block
Letter to Patient
Letter to Physician

Statin
Letter to Patient
Letter to Physician

Multiple Medications
Letter to Patient
Letter to Physician

QI Webinar
Series

Discharge Medications: Reaching and Sustaining our Goal of 100%

Presented by:

Randell R. De Martino, MD, MS

Cheryl R. Jackson, DNP, MS, RN, CPHQ

SVS | PSO
PATIENT SAFETY ORGANIZATION

Recommendations/Implications

- Sustainability
  - System level changes were implemented
    - The antiplatelet and statin medications are imbedded in the discharge order sets
    - Electronic Medical Record
    - Process easily transferable
- Implication
  - Correlate Go With the Flow project to readmission rates for the PVI patient population

Lessons Learned

- Identify all stakeholders
- Validity
- Be patient
- Be vigilant
- Be realistic

Dissemination of Findings

- Organization (System)
  - Stakeholders
  - Direct care givers
  - Upper management
- Publications
  - *Association of peri-Operative Registered Nurses*
  - *Journal of Vascular Nursing*

Summary

The first step in decreasing mortality rate and increasing graft patency at one year and five years in the PVI patient is to prescribe antiplatelet and statin therapy at discharge.

QI Webinar
Series

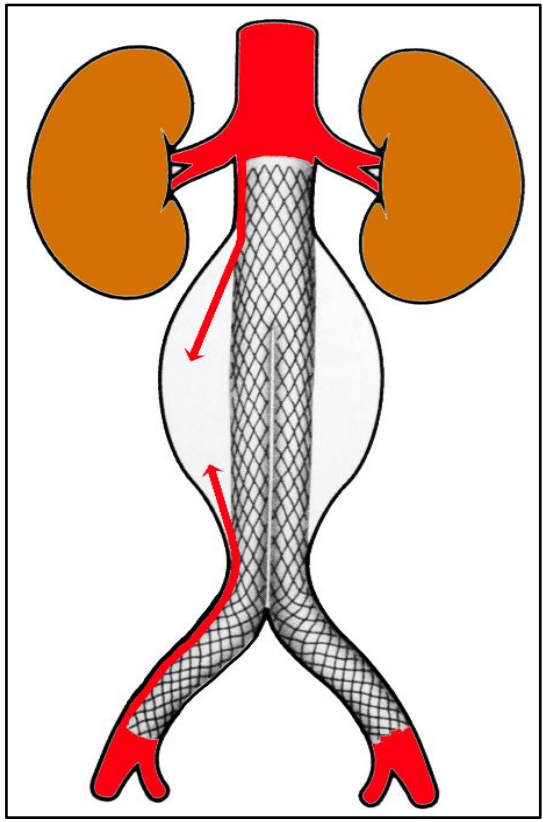
EVAR LONG TERM FOLLOW-UP IMAGING: UNDERSTANDING CURRENT TRENDS TO IMPROVE THE FUTURE

Adam Beck, MD,FACS
Sal Scali, MD, FACS

SVS | PSO
PATIENT SAFETY ORGANIZATION

Outline

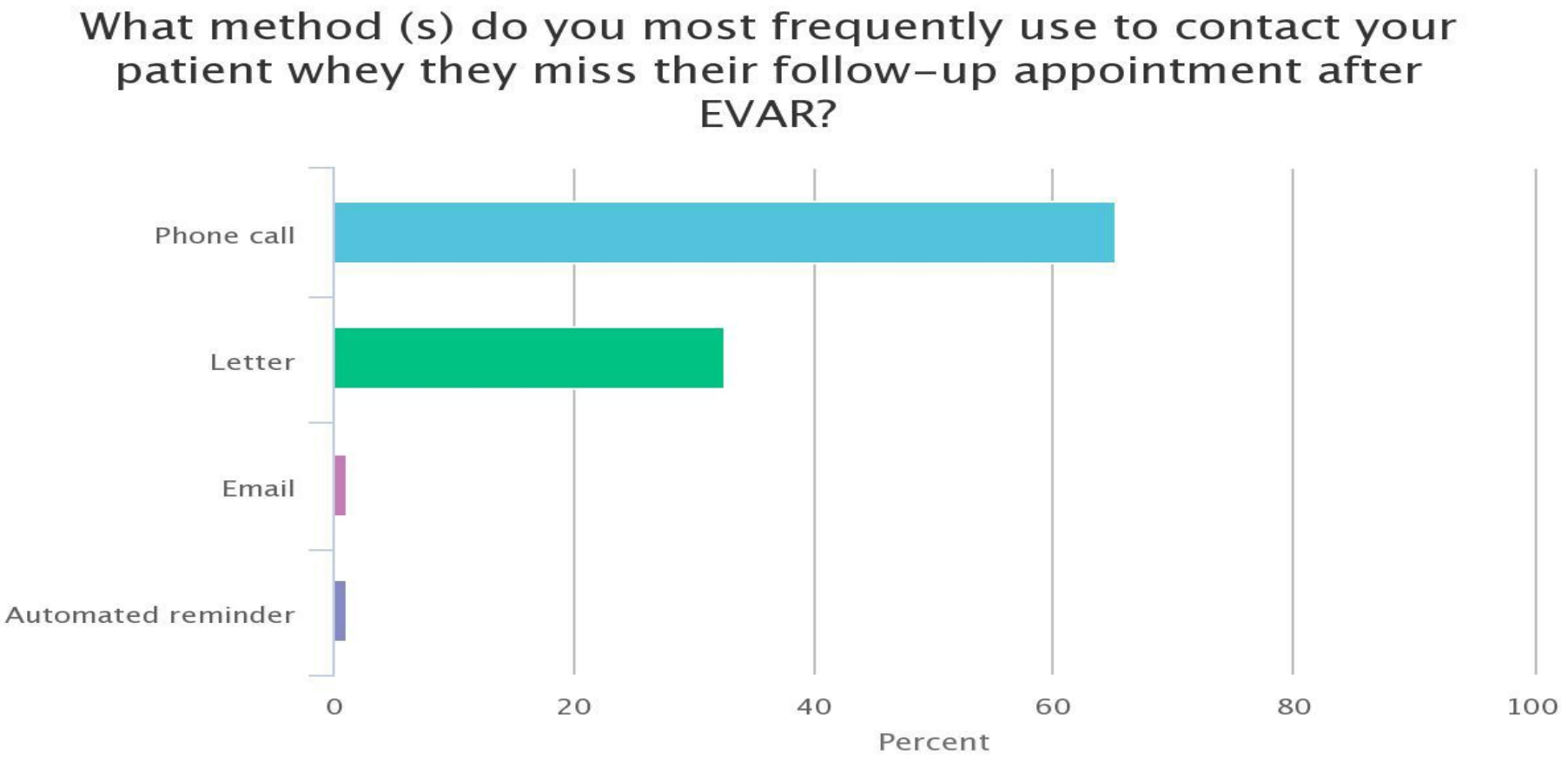
- Background
- VQI Trends
- QI Initiative
- Focus Group Feedback
- Future Directions



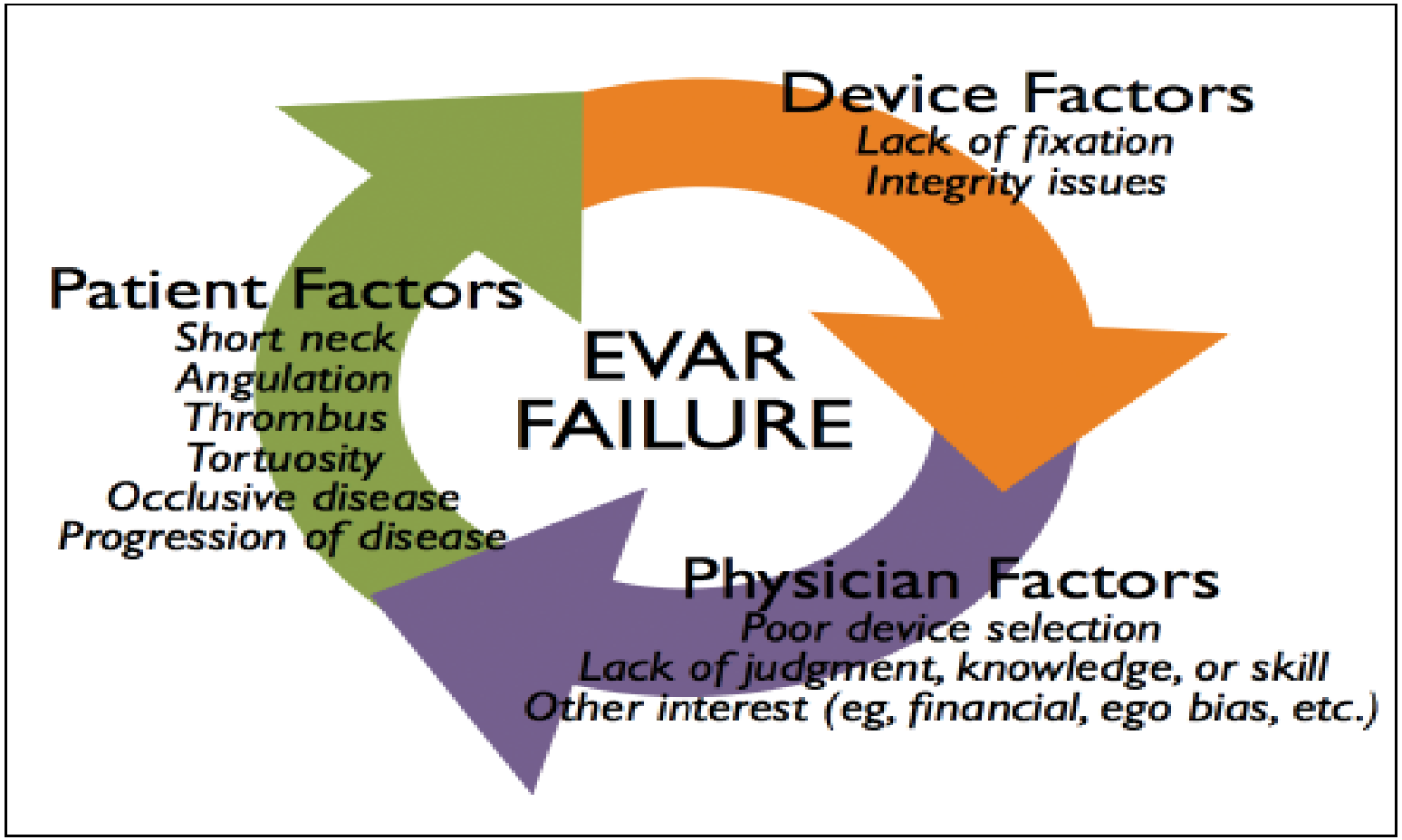
AAA Management

EVAR patient without imaging follow-up = Unrepaired AAA

Question#1


What method (s) do you most frequently use to contact your patient whey they miss their follow-up appointment after EVAR?
Phone call
Letter
Email
Automated reminder
0
20
40
60
80
100
Percent

Mechanisms of EVAR Failure



Johnstone&Oderich Endovasc Today 2/2014

Background

- Postoperative imaging surveillance recommended by societies and regulatory agencies
- Recent studies suggest low compliance with follow-up imaging
- Improving compliance with postoperative surveillance has been identified as a major opportunity for surgical quality improvement

Chaikof et. al. J Vasc Surg. 2009;50(4):880-896
Garg et al. JAMA Surg. 2015;150(10):957-963
Schanzer et al. J Vasc Surg. 2015;61(1):16-22 e11
Sternberg et. al. J Vasc Surg. 2008;48:278-284

Current Guidelines EVAR Surveillance: ACR

QI Webinar Series

Last review date: 2012

American College of Radiology
ACR Appropriateness Criteria®

Clinical Condition: Abdominal Aortic Aneurysm: Interventional Planning and Follow-up

Variant 1: Planning for pre-endovascular repair (EVAR) or open repair of AAA.

Radiologic Procedure	Rating	Comments	RRL*
CTA abdomen and pelvis with IV contrast	9	For evaluation of known AAA without thoracic aortic involvement. Noncontrast sequence is not necessary for interventional planning.	☢☢☢☢☢
CTA chest abdomen pelvis with IV contrast	8	Useful for patients with suspected AAA but no prior workup of the thoracic aorta. Study of choice for workup of suprarenal AAA or thoracoabdominal aneurysm.	☢☢☢☢☢
CT abdomen and pelvis without IV contrast	6	At physician's discretion, chest may not be included. Appropriate for patients with contraindication to iodinated contrast. Occasionally depicts density differences between the blood pool and aortic wall/mural thrombus. Otherwise, further luminal assessment with MRI, US, or DSA would be preferred.	☢☢☢☢
MRA abdomen and pelvis without and with IV contrast	6	Alternative to CTA in patients with known AAA not involving the thoracic aorta and in whom iodinated contrast is contraindicated.	O
CT chest abdomen pelvis without IV contrast	5	Appropriate for patients with contraindication to iodinated contrast. Occasionally depicts density differences between the blood pool and aortic wall/mural thrombus. Otherwise, further luminal assessment with MRI, US, or DSA would be preferred.	☢☢☢☢
Digital subtraction angiography (DSA) aorta	5	May be appropriate in select cases, including patients who require pre-operative embolization of branch vessels or those requiring further characterization of the aortic lumen with an alternative contrast agent (such as CO_2) or intravascular US.	☢☢☢
MRA chest abdomen pelvis without and with IV contrast	5	Alternative to CTA in patients with contraindication to iodinated contrast who have had no prior evaluation of thoracic aorta.	O
MRA chest abdomen pelvis without IV contrast	4	Appropriate for patients with severe renal dysfunction.	O
MRA abdomen and pelvis without IV contrast	4	Appropriate for patients with severe renal dysfunction. At physician's discretion, chest may not be included.	O
US aorta abdomen with Doppler	3	Useful screening tool, but insufficient for AAA treatment planning. May be used in tandem with DSA in the absence of cross-sectional imaging, or as an adjunct to noncontrast CT for luminal evaluation.	O
X-ray chest abdomen pelvis	1		☢☢☢

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate — *Relative Radiation Level

Clinical Condition: Abdominal Aortic Aneurysm: Interventional Planning and Follow-up

Variant 2: Follow-up for post-endovascular repair (EVAR) or open repair of AAA.

Radiologic Procedure	Rating	Comments	RRL*
CTA abdomen and pelvis with IV contrast	9	Method of choice.	☢☢☢☢☢
MRA abdomen and pelvis without and with IV contrast	7	Appropriate alternative to CTA, but less accurate for assessing endograft metallic components. Effectiveness depends on composition of endoprosthesis. 3D contrast-enhanced MRA and time-resolved MRA are highly sensitive to endoleaks.	O
CT abdomen and pelvis without IV contrast	6	Appropriate for patients with MR-incompatible devices or contraindication to iodinated contrast. Provides temporal information regarding sac morphology with reduced contrast exposure and radiation burden. US is a useful adjunctive tool for endoleak detection.	☢☢☢☢
Digital subtraction angiography (DSA) aorta	6	Selectively useful for characterization and treatment of endoleaks type I and III.	☢☢☢
MRA abdomen and pelvis without IV contrast	5	Selectively useful for assessment of renal or mesenteric vasculature in patients with contraindication to iodinated contrast.	O
US aorta abdomen with Doppler	5	Important adjunct to noncontrast CT for endoleak detection. May be useful in endoleak characterization.	O
X-ray abdomen and pelvis	4	Provides detailed survey for structural integrity of the metallic components of the endograft but not the nonmetallic components. Particularly useful with tortuous anatomy. However, inadequate as a stand-alone follow-up modality.	☢☢☢

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate — *Relative Radiation Level

SVS | PSO
PATIENT SAFETY ORGANIZATION

Current Guidelines EVAR Surveillance: SVS

SVS PRACTICE GUIDELINES

From the Society for Vascular Surgery

SVS practice guidelines for the care of patients with an abdominal aortic aneurysm: Executive summary

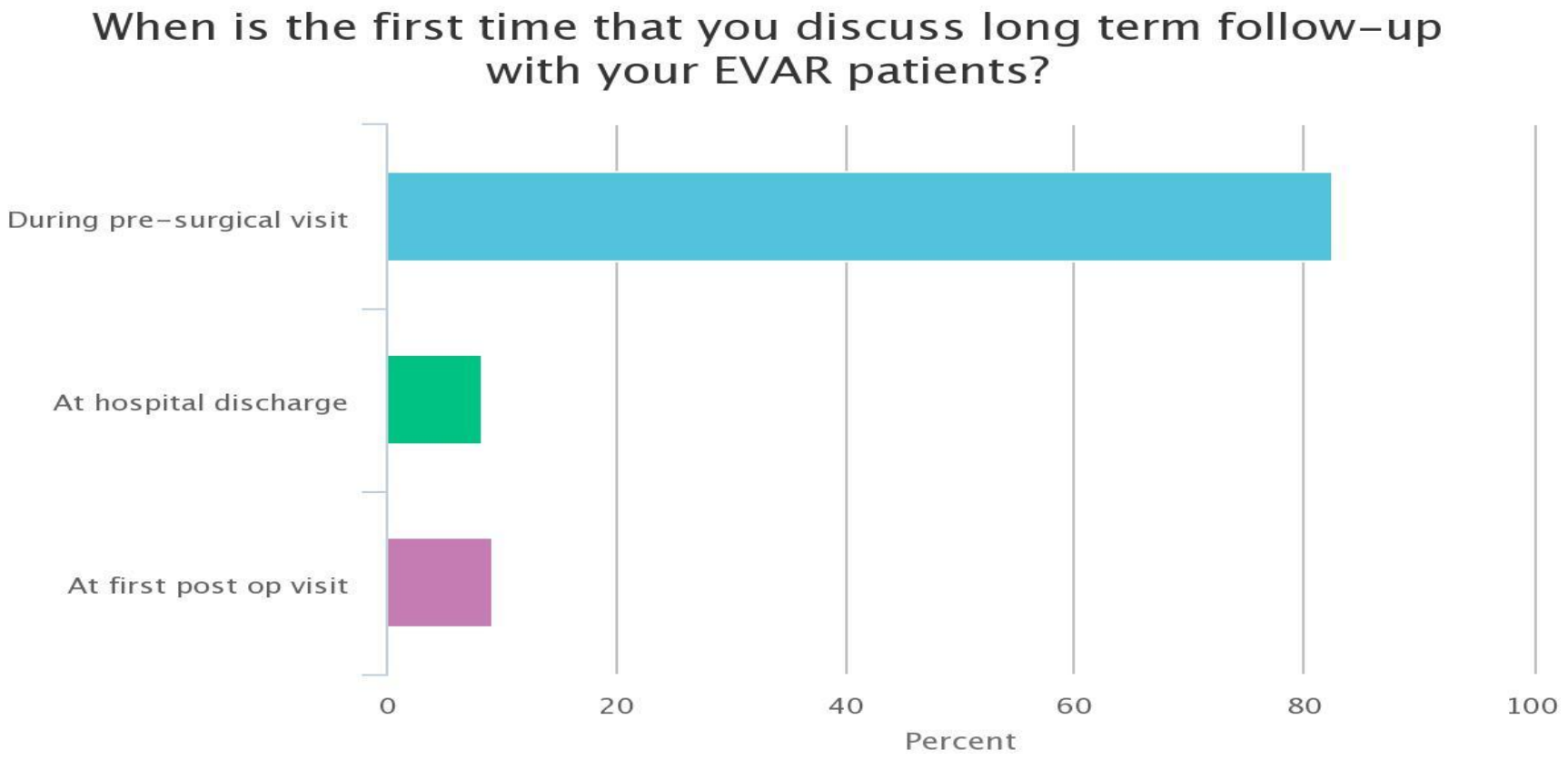
Elliot L. Chaikof, MD, PhD,[a] David C. Brewster, MD,[b] Ronald L. Dalman, MD,[c] Michel S. Makaroun, MD,[d] Karl A. Illig, MD,[e] Gregorio A. Sicard, MD,[f] Carlos H. Timaran, MD,[g] Gilbert R. Upchurch Jr, MD,[h] and Frank J. Veith, MD,[i] *Atlanta, Ga; Boston, Mass; Palo Alto, Calif; Pittsburgh, Pa; Rochester, NY; St. Louis, Mo; Dallas, Tex; Ann Arbor, Mich; and Cleveland, Ohio*

"We currently recommend contrast enhanced CT imaging at 1 and 12 months during the first year after EVAR."

Chaikof et al. J Vasc Surg. 2009;50(4):880-896

SVS | PSO
PATIENT SAFETY ORGANIZATION

Question #2


When is the first time that you discuss long term follow-up with your EVAR patients?
During pre-surgical visit
At hospital discharge
At first post op visit
0
20
40
60
80
100
Percent

Contemporary Practice

QI Webinar Series

CLINICAL STUDY

Current Clinical Practice in Postoperative Endovascular Aneurysm Repair Imaging Surveillance

Heiko Uthoff, MD, Constantino Peña, MD, Barry T. Katzen, MD, Ripal Gandhi, MD, James West, James F. Benenati, MD, and Philipp Geisbüsch, MD

SVS | PSO
PATIENT SAFETY ORGANIZATION

Uthoff et. al.

		Post-EVAR								
	Pre-EVAR	Disc.	1 mo	3 mo	6 mo	1 y	2 y	3 y	4 y	5 y
Abdominal radiography	5.6	**15.7**	6.6	6.6	11.7	18.6	16.5	17.5	15.5	15.9
Angiography	10.9	2.5	0.0	0.4	0.6	1.2	0.4	0.4	0.4	0.4
CT										
Any phase	**67.8**	14.4	**44.1**	**26.6**	**38.8**	**64.5**	**45.4**	**42.3**	**36.7**	**43.5**
Nonenhanced	17.3	4.1	12.0	8.5	10.5	19.8	13.8	13.8	12.4	14.6
Arterial phase	59.8	13.4	38.1	24.3	32.0	54.4	36.3	33.6	28.5	34.2
Delayed phase	16.9	8.5	23.5	14.6	21.4	34.4	24.1	21.2	18.8	22.3
3D volume analysis	28.9	3.7	13.0	7.8	13.4	20.6	14.4	13.4	11.7	13.0
US										
Color duplex	15.7	14.0	16.9	17.7	26.6	30.3	35.0	35.5	36.3	34.6
Contrast-enhanced	1.4	1.6	2.1	2.1	2.9	2.7	3.1	2.7	2.9	2.5
MR imaging										
Nonenhanced	0.8	0.0	0.4	0.2	0.6	0.4	0.4	0.2	0.2	0.2
Contrast-enhanced	1.2	0.0	0.6	0.4	0.6	0.8	0.2	0.2	0.2	0.2
Implantable sac pressure sensor	0.8	1.6	2.1	1.2	2.9	3.3	3.1	2.9	2.7	2.9

Uthoff et. al. JVIR;2012:1152-1159

SVS | PSO
PATIENT SAFETY ORGANIZATION

Follow-up Compliance

QI Webinar Series

Published in final edited form as:
J Vasc Surg. 2015 January ; 61(1): 16–22.e1. doi:10.1016/j.jvs.2014.06.006.

Follow-Up Compliance After Endovascular Abdominal Aortic Aneurysm Repair in Medicare Beneficiaries

Andres Schanzer, MD[1], **Louis M. Messina, MD**[1], **Kaushik Ghosh, PhD**[2], **Jessica P. Simons, MD, MPH**[1], **William P. Robinson III, MD**[1], **Francesco A Aiello, MD**[1], **Robert J. Goldberg, PhD**[1], and **Allison B. Rosen, MD, MPH, ScD**[1,2]

[1]University of Massachusetts Medical School, Worcester, MA

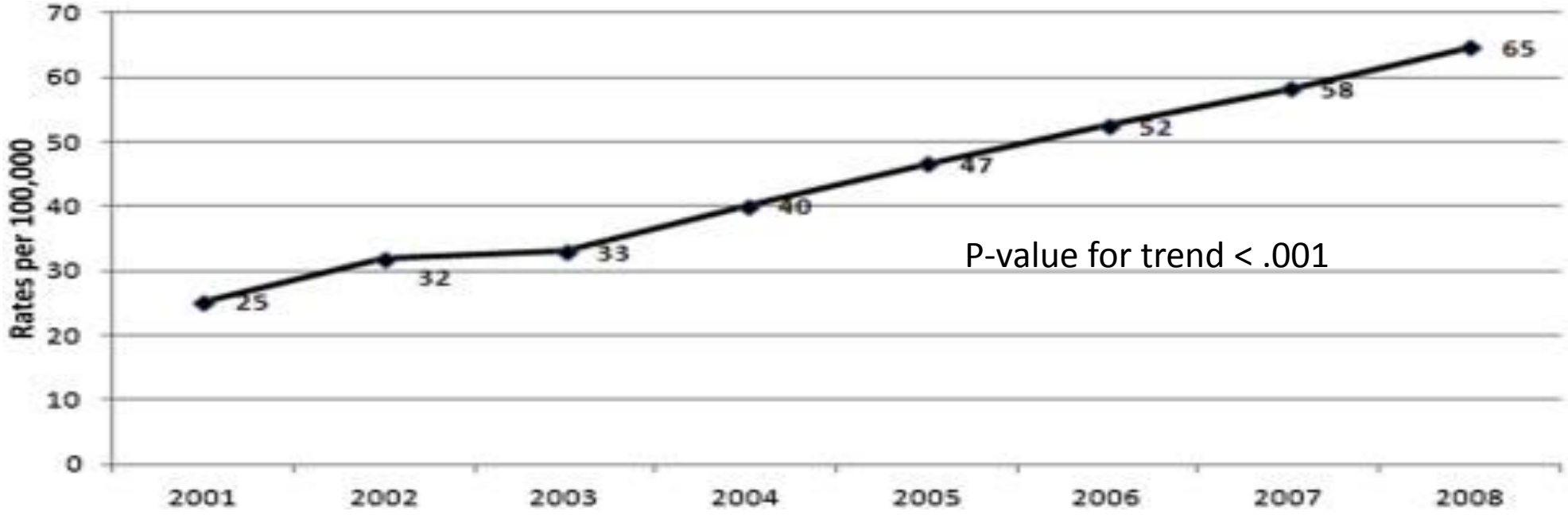
[2]National Bureau of Economic Research, Cambridge, Massachusetts

***19,962 Medicare beneficiaries** (age ≥ 65) EVAR 2001-2008**

SVS | PSO
PATIENT SAFETY ORGANIZATION

EVAR Procedures: Medicare Beneficiaries

Number of Hospitalizations for EVAR procedures per 100,000 Medicare Beneficiaries

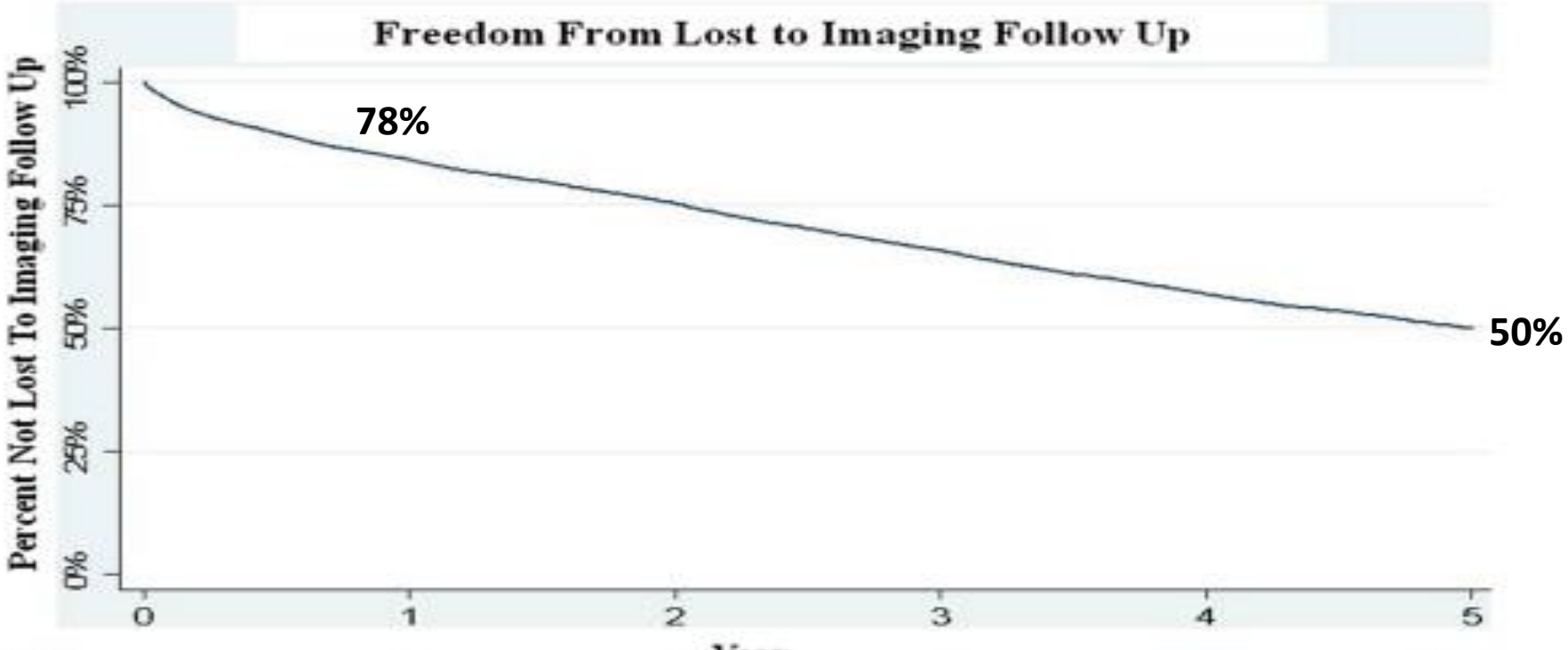


2.5-fold increase in annual EVAR procedures [1400 in 2001 vs 3529 in 2008]

Schanzer et. al. J Vasc Surg, Vol 61, Issue 1, 2015, 16-22

SVS | PSO
PATIENT SAFETY ORGANIZATION

Proportion Lost to LTFU: Medicare



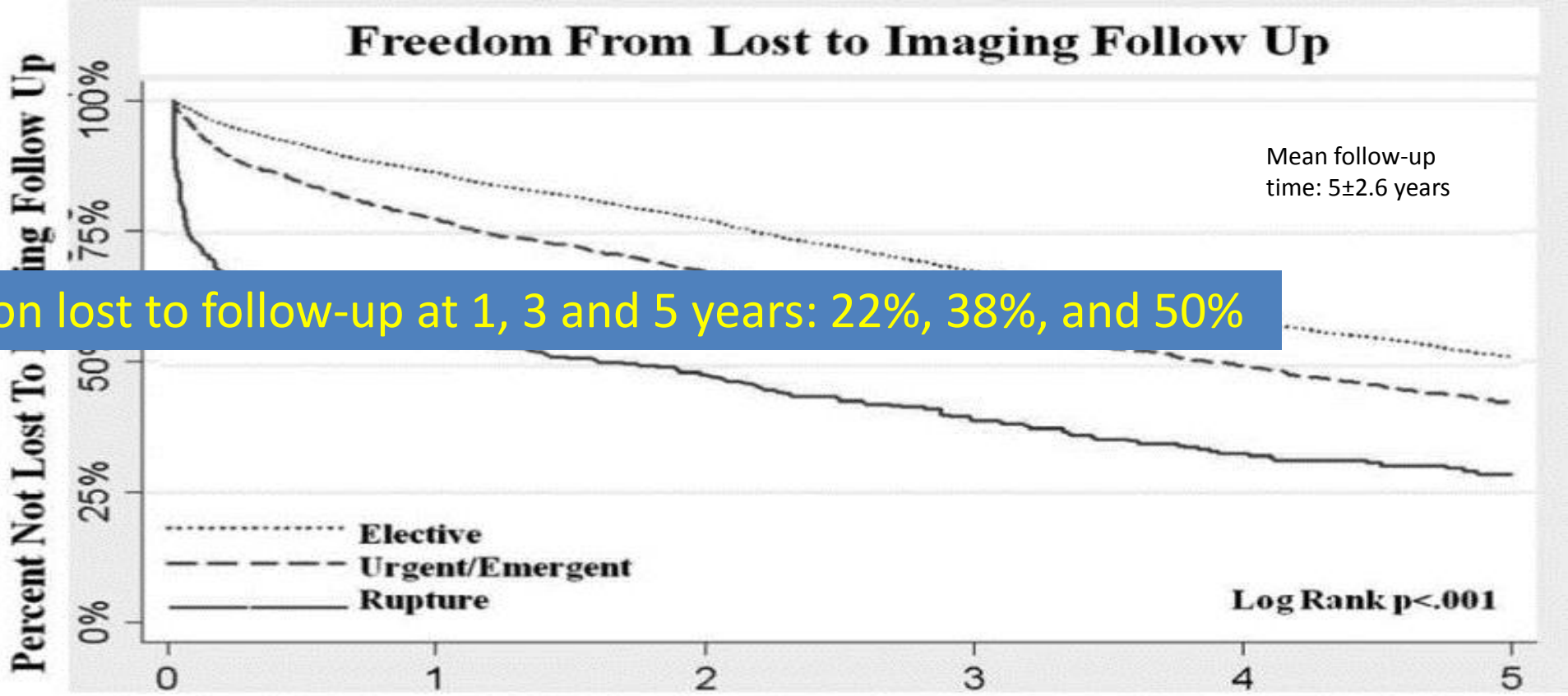
YEAR	1	2	3	4	5
NUMBER AT RISK	16,243	13,040	9,161	6,105	3,882
KM ESTIMATE	84.2	75.4	65.8	57.0	50.1
STANDARD ERROR	0.003	0.003	0.004	0.004	0.004

Schanzer et. al. J Vasc Surg, Vol 61, Issue 1, 2015, 16-22

SVS | PSO
PATIENT SAFETY ORGANIZATION

Lost to LTFU: Medicare

QI Webinar Series



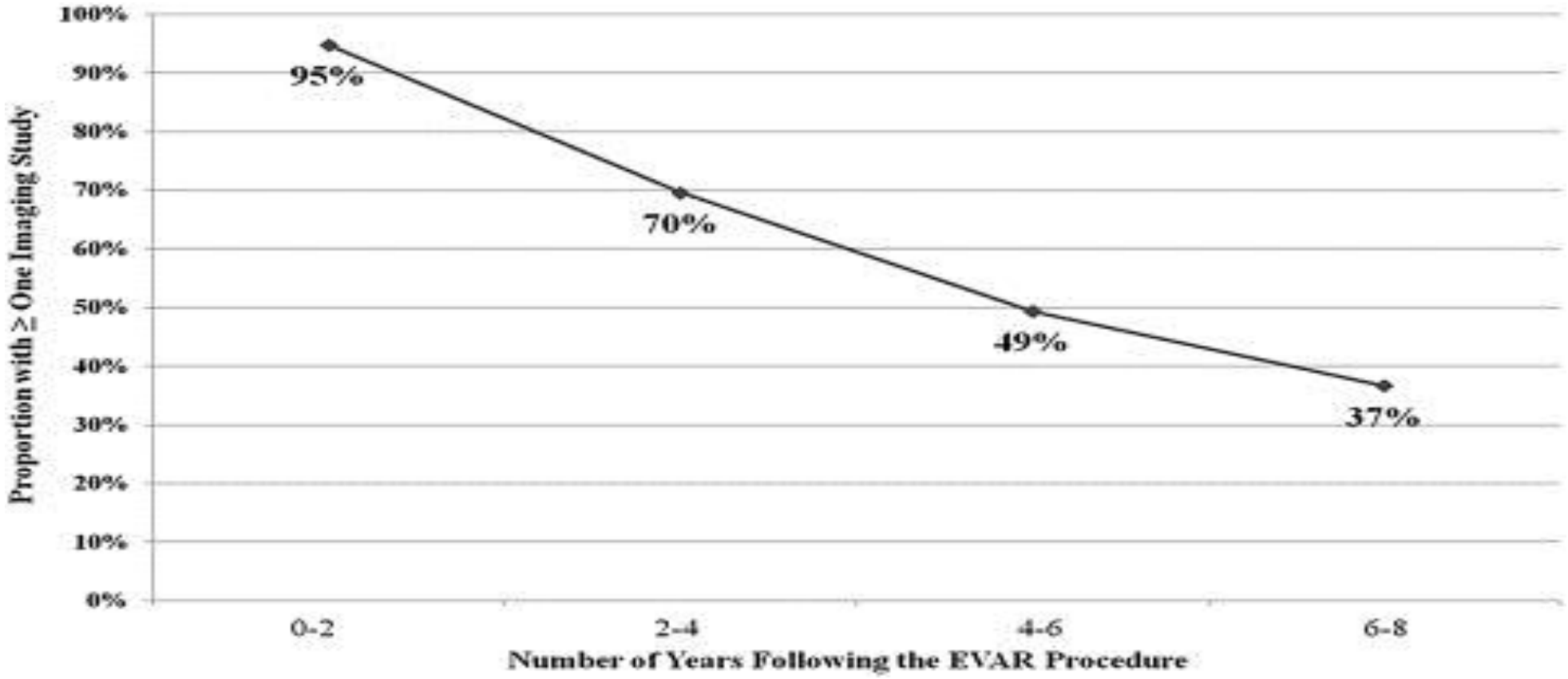
Proportion lost to follow-up at 1, 3 and 5 years: 22%, 38%, and 50%

Years post-procedure

Schanzer et. al. J Vasc Surg, Vol 61, Issue 1, 2015, 16-22

SVS | PSO
PATIENT SAFETY ORGANIZATION

Percentage Lost to LTFU: Medicare



Schanzer et. al. J Vasc Surg, Vol 61, Issue 1, 2015, 16-22

Predictors of Lost to LTFU: Medicare

Variable	HR	95% CI
Age (vs. 65-69 yrs)		
75-79	1.23	1.15-1.32
80-85	1.45	1.35-1.55
>85	2.03	1.8802.20
Ruptured AAA (vs. Elective AAA) Urgent/symptomatic AAA	1.84 1.27	1.63-2.08 1.20-1.35
Comorbidities		
CHF	1.52	1.43-1.61
CRI	1.37	1.27-1.49
COPD	1.29	1.23-1.35
CVOD	1.07	1.01-1.15
Cancer	1.12	1.06-1.19
Diabetes	1.07	1.02-1.13
US Region		
East	Ref	Ref
Midwest	1.05	0.98-1.11
South	1.1	1.03-1.17
West	1.16	1.07-1.25

Schanzer et. al. J Vasc Surg, Vol 61, Issue 1, 2015, 16-22

Does Poor LTFU Matter Clinically?

Impact of Loss to LTFU: VQI

QI Webinar Series

From the Society for Vascular Surgery

Endovascular aneurysm repair patients who are lost to follow-up have worse outcomes

Caitlin W. Hicks, MD, MS,[a] Devin S. Zarkowsky, MD,[b] Ian C. Bostock, MD, MS,[b] David H. Stone, MD, MHS,[b] James H. Black III, MD,[a] Jens Eldrup-Jorgensen, MD,[c] Philip P. Goodney, MD, MS,[b] *and* Mahmoud B. Malas, MD, MHS,[a] *Baltimore, Md; Lebanon, NH; and Portland, Me*

ARTICLE HIGHLIGHTS

- **Significance:** This study compares 5-year outcomes after endovascular aneurysm repair (EVAR) of patients who were lost to follow-up or had phone call follow-up with those of patients who had follow-up in-person.
- **Type of Research:** Retrospective analysis of prospectively collected Vascular Quality Initiative (VQI) data
- **Take Home Message:** This study of 11,309 elective EVAR patients revealed that patients who are lost to follow-up and those with phone call follow-up have higher 5-year all-cause mortality compared with patients who follow up in-person.
- **Recommendation:** The authors suggest that lack of follow-up after EVAR is a risk factor for increased 5-year mortality.
- **Strength of Recommendation:** 2. Weak
- **Level of Evidence:** B. Low to very low

SVS | PSO
PATIENT SAFETY ORGANIZATION

Impact of Loss to LTFU: VQI

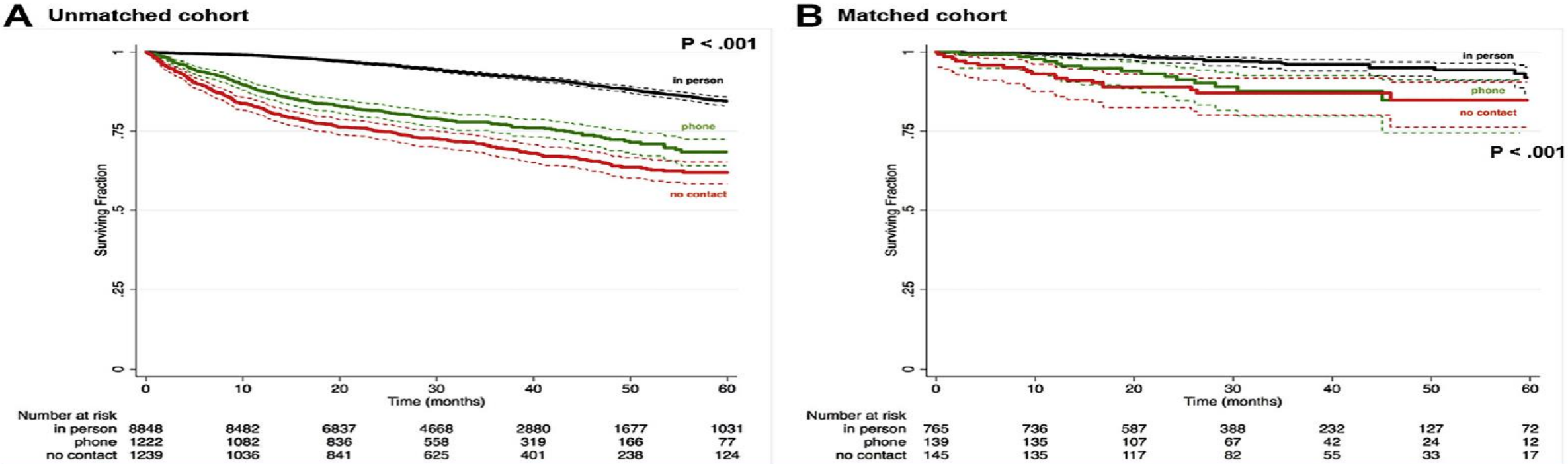


Fig 2. Kaplan-Meier curves showing survival after endovascular aneurysm repair (EVAR) among patients with in-person follow-up vs phone call follow-up vs no follow-up using the aggregate unmatched cohort **(A)** and matched cohort **(B)**.

SVS | PSO
PATIENT SAFETY ORGANIZATION

Impact of Loss to LTFU: VQI

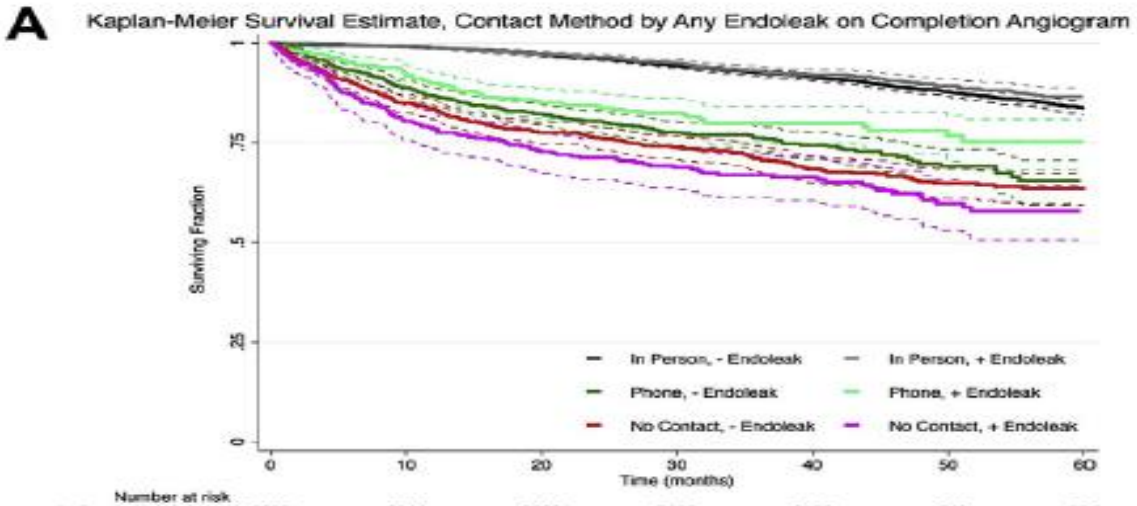
Table IV. Multivariable analysis[a]

Variable	HR (95% CI)	*P* value
Follow-up method		
In-person	Reference	—
Phone call	3.48 (2.66-4.57)	<.001
None	6.45 (4.89-8.51)	<.001
Age (per year)	1.05 (1.04-1.06)	<.001
Black race	0.62 (0.37-1.04)	.07
Primary insurance, self-pay	2.61 (1.18-5.78)	.02
Unfit for open surgery	1.60 (1.28-2.00)	<.001
Smoking (any)	1.27 (0.97-1.68)	.09
CHF	1.60 (1.26-2.03)	<.001
COPD	1.25 (1.02-1.54)	.03
Dialysis	2.68 (1.56-4.62)	<.001
Postoperative renal failure		
Acute kidney injury	1.66 (1.06-2.62)	.03
Temporary dialysis	5.80 (2.44-13.8)	<.001
Discharge to nursing home	2.01 (1.39-2.90)	.04

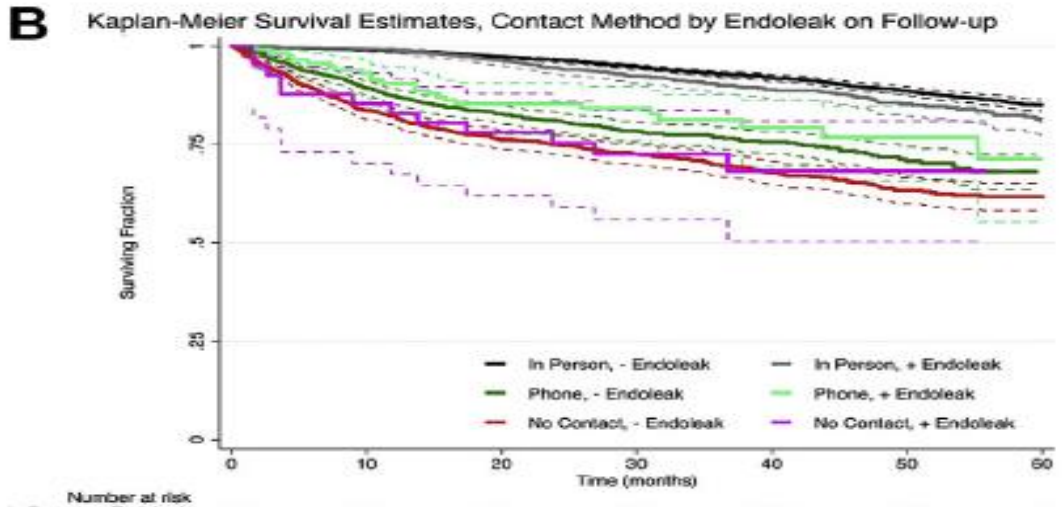
CHF, Congestive heart failure; *CI*, confidence interval; *COPD*, chronic obstructive pulmonary disease; *HR*, hazard ratio.
[a]C statistic = 0.81.

SVS | PSO
PATIENT SAFETY ORGANIZATION

Impact of Loss to LTFU: VQI



Number at risk	0	10	20	30	40	50	60
In Person, - Endoleak	6536	6244	5038	3453	2128	1240	780
In Person, + Endoleak	2312	2238	1799	1215	752	437	271
Phone, - Endoleak	865	756	582	382	216	110	48
Phone, + Endoleak	357	326	254	176	103	56	20
No Contact, - Endoleak	928	786	638	466	293	173	87
No Contact, + Endoleak	311	250	203	159	108	65	37

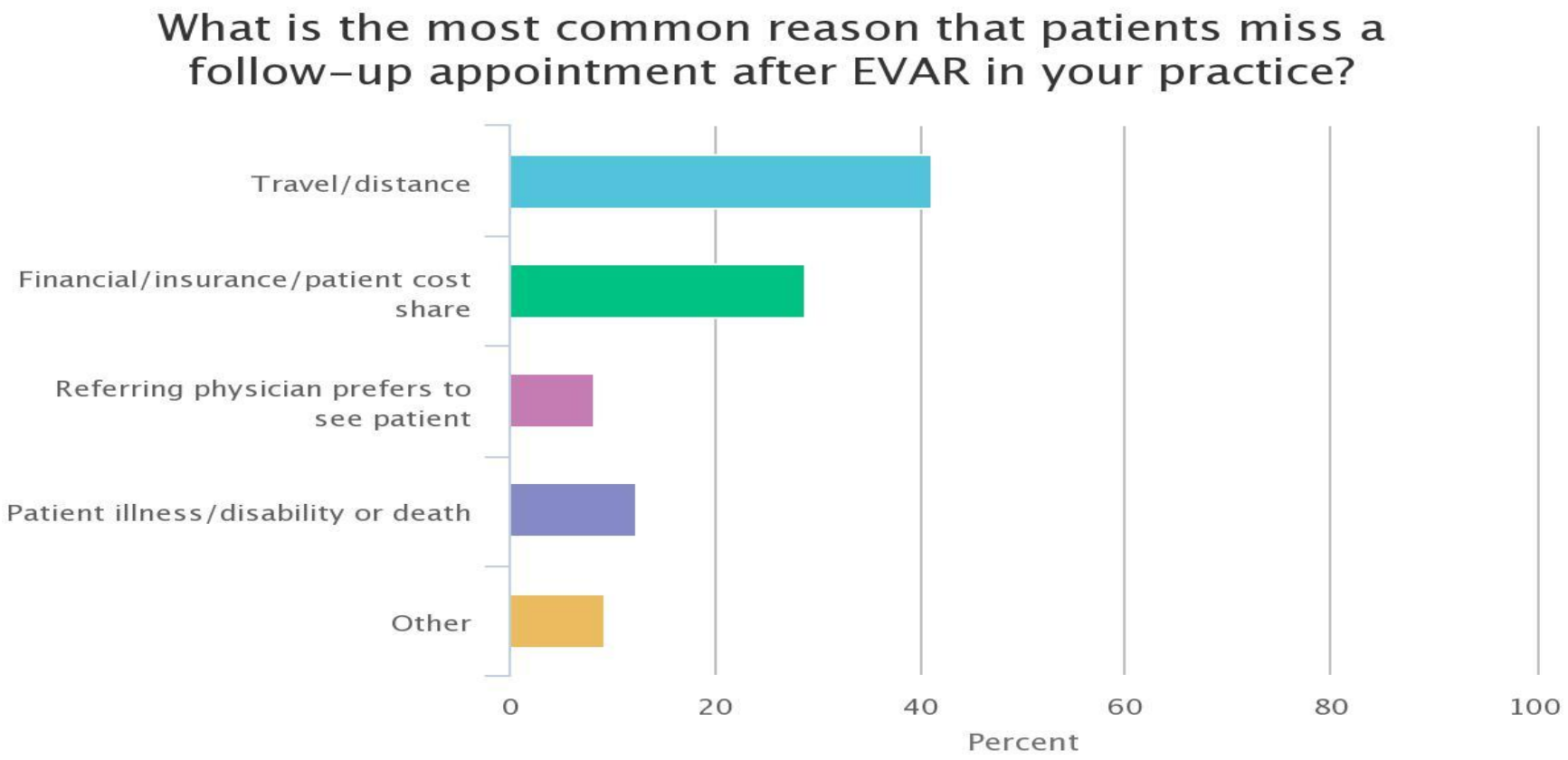


Number at risk	0	10	20	30	40	50	60
In Person, - Endoleak	7732	7378	5844	3956	2418	1397	857
In Person, + Endoleak	1116	1104	993	712	462	280	174
Phone, - Endoleak	1106	974	744	499	285	146	68
Phone, + Endoleak	116	108	92	59	34	20	9
No Contact, - Endoleak	1198	1001	809	600	387	230	121
No Contact, + Endoleak	41	35	32	25	14	8	3

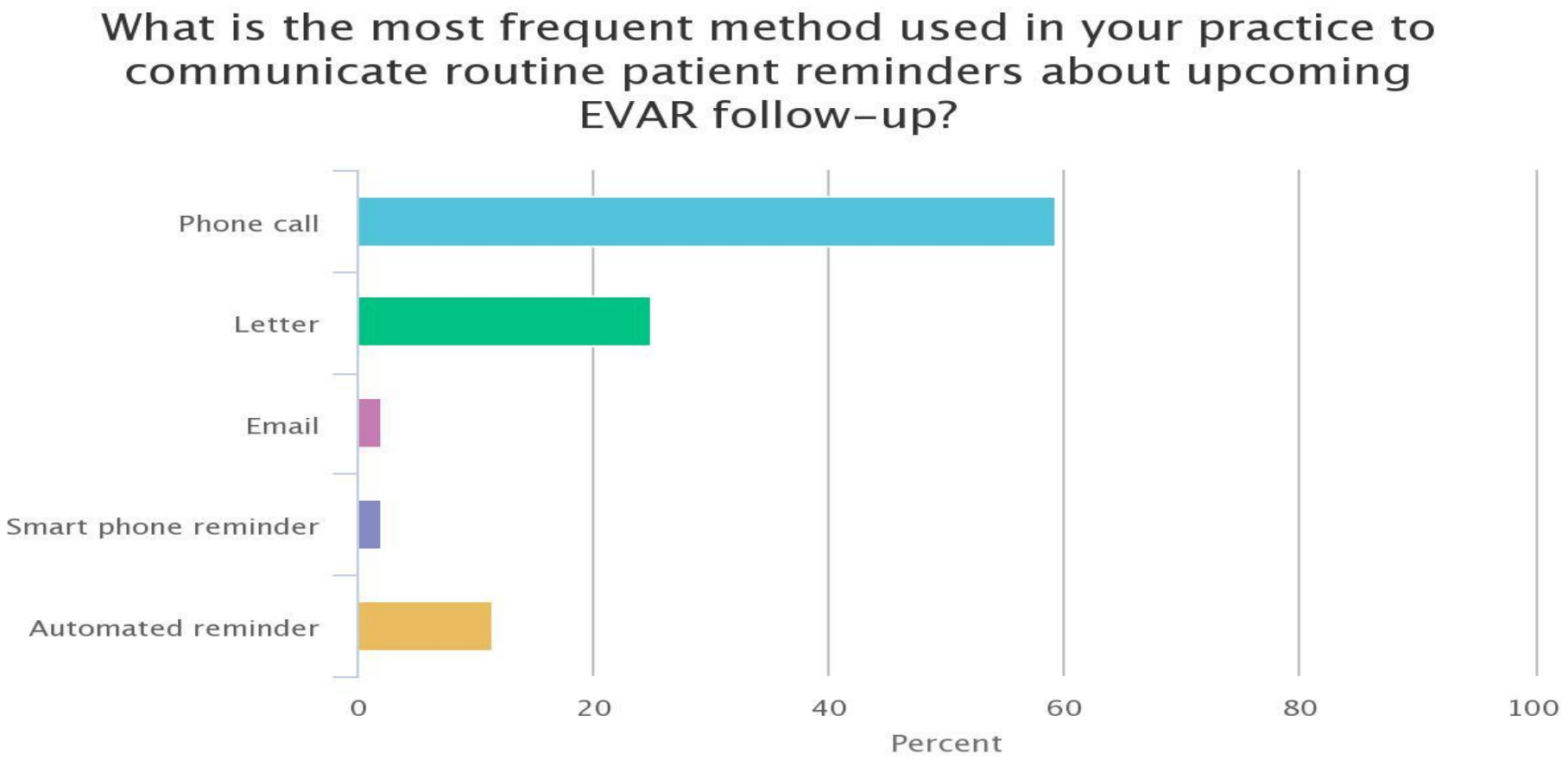
Fig 3. Kaplan-Meier curves showing survival after endovascular aneurysm repair (EVAR) stratified by both follow-up method and the presence or absence of immediate postoperative **(A)** or long-term **(B)** endoleak. There are no significant differences in survival for each group based on endoleak status (all, $P =$ NS).

SVS | PSO
PATIENT SAFETY ORGANIZATION

Question #3


What is the most common reason that patients miss a follow-up appointment after EVAR in your practice?
Travel/distance
Financial/insurance/patient cost share
Referring physician prefers to see patient
Patient illness/disability or death
Other
0
20
40
60
80
100
Percent

Question #4

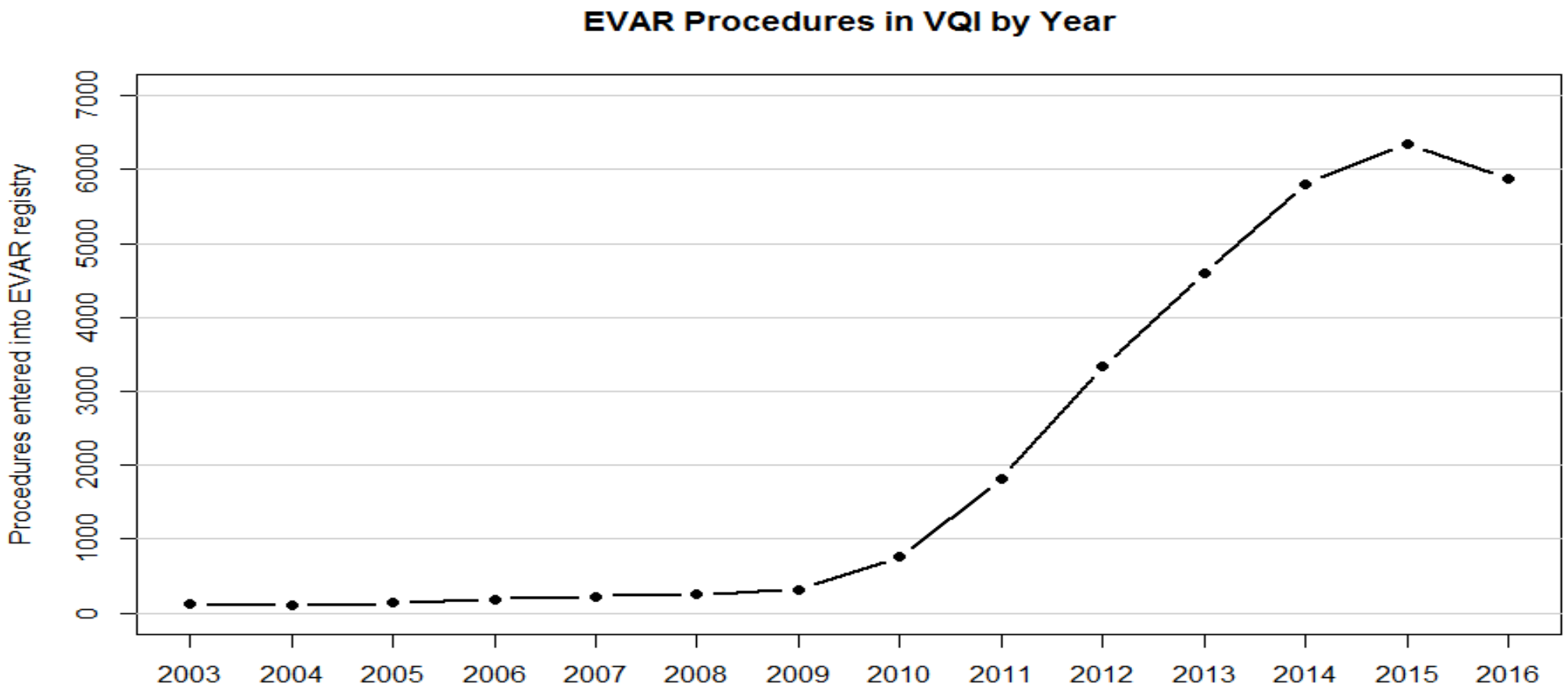

What is the most frequent method used in your practice to communicate routine patient reminders about upcoming EVAR follow-up?
Phone call
Letter
Email
Smart phone reminder
Automated reminder
0
20
40
60
80
100
Percent

What about VQI?

Current Trends in EVAR Surveillance in the VQI

AAA Care in the VQI

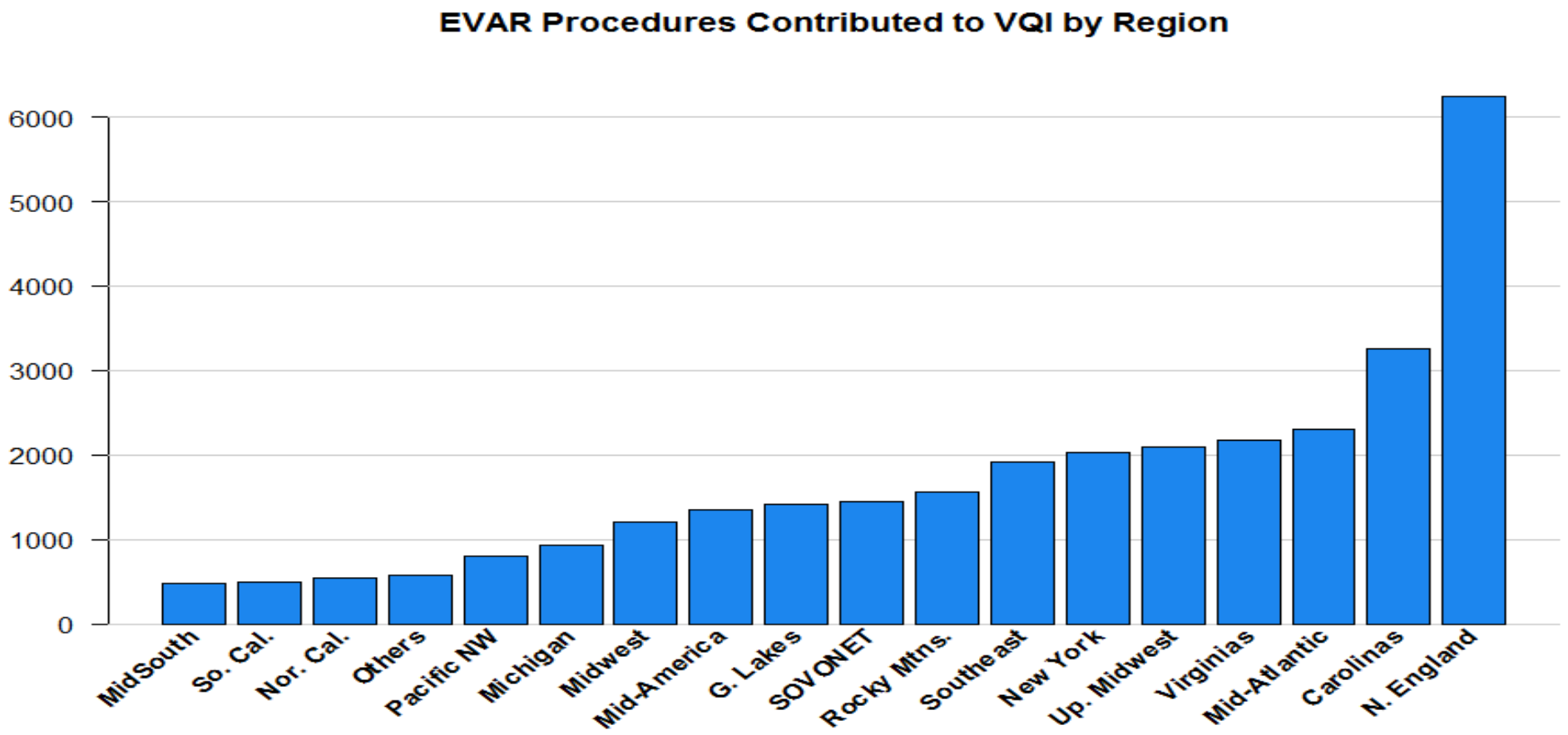
QI Webinar Series



SVS | PSO
PATIENT SAFETY ORGANIZATION

VQI EVAR Volume by Region

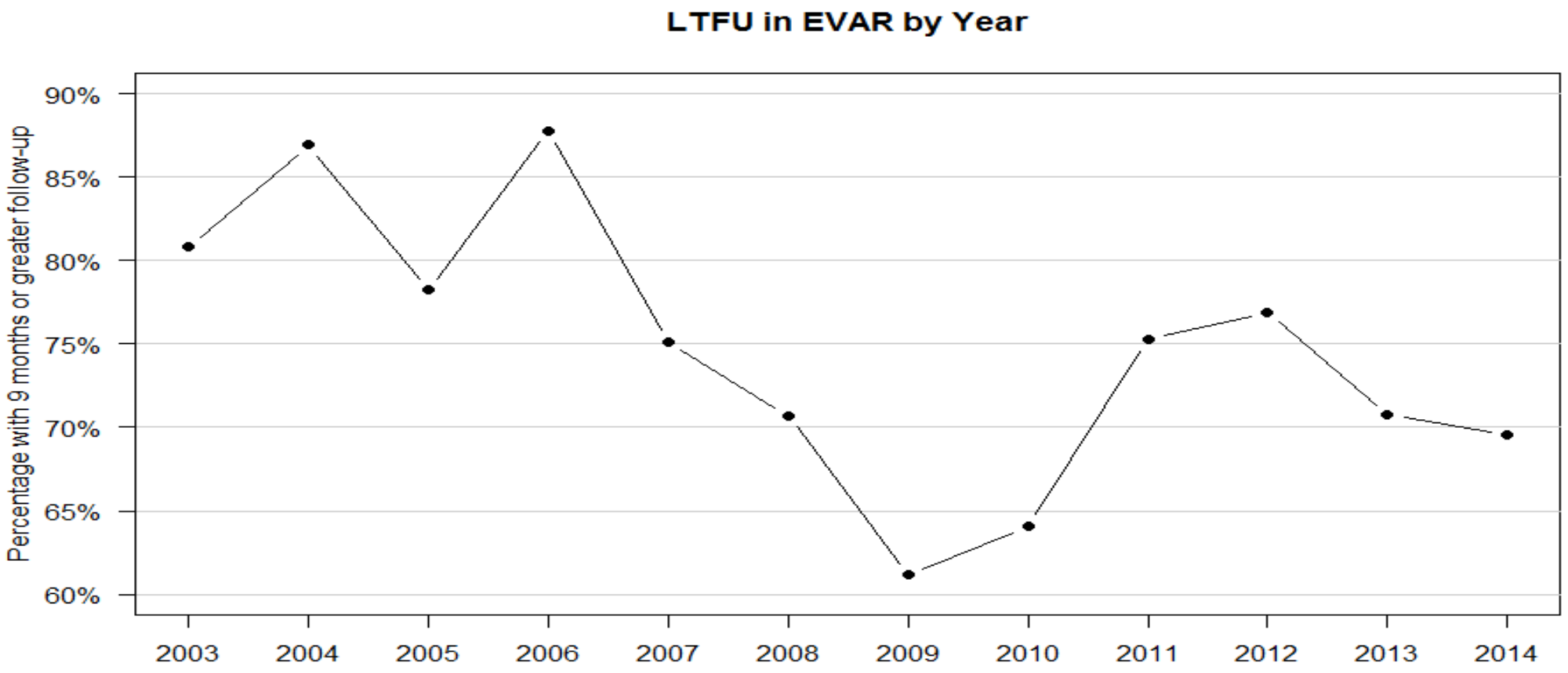
QI Webinar Series



SVS | PSO
PATIENT SAFETY ORGANIZATION

EVAR LTFU in VQI

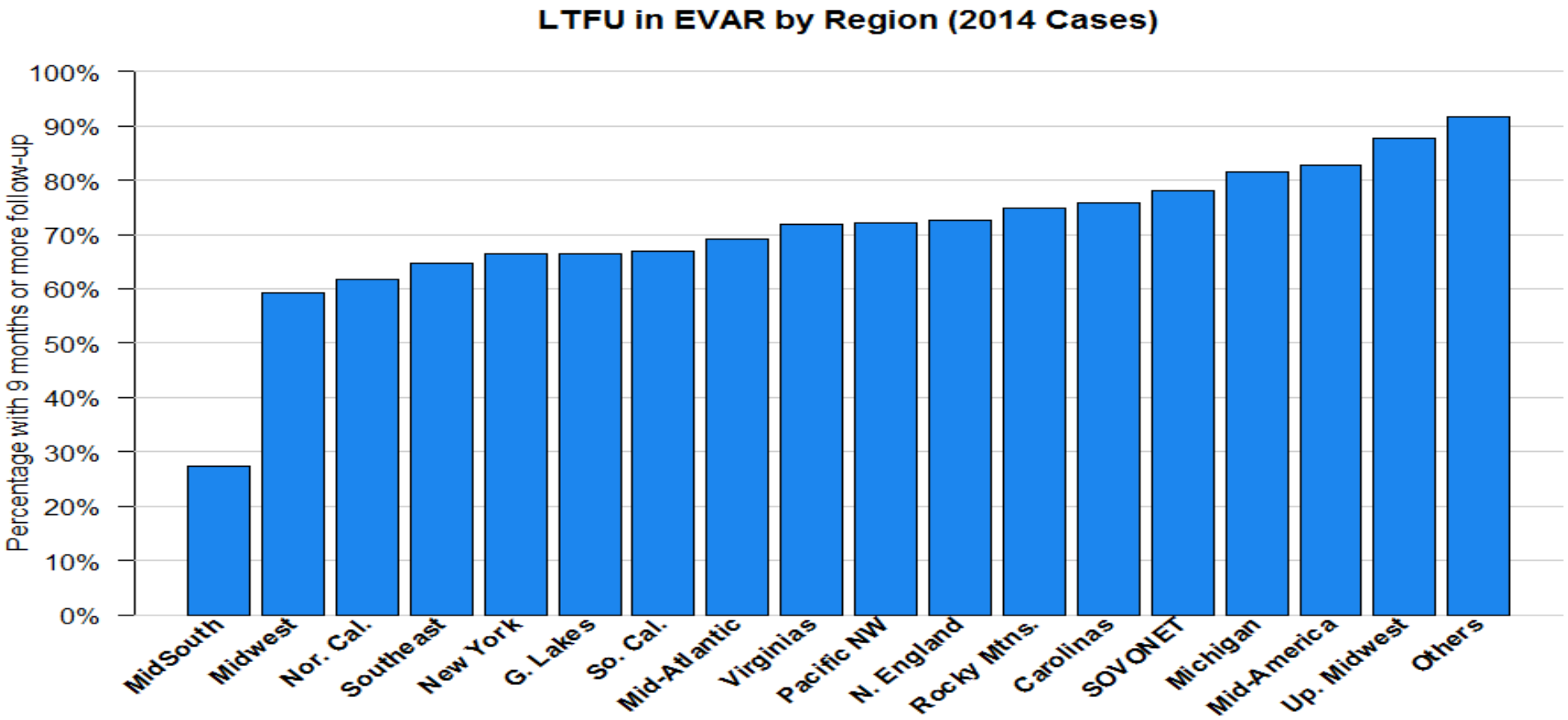
QI Webinar Series



SVS | PSO
PATIENT SAFETY ORGANIZATION

EVAR LTFU in VQI by Region

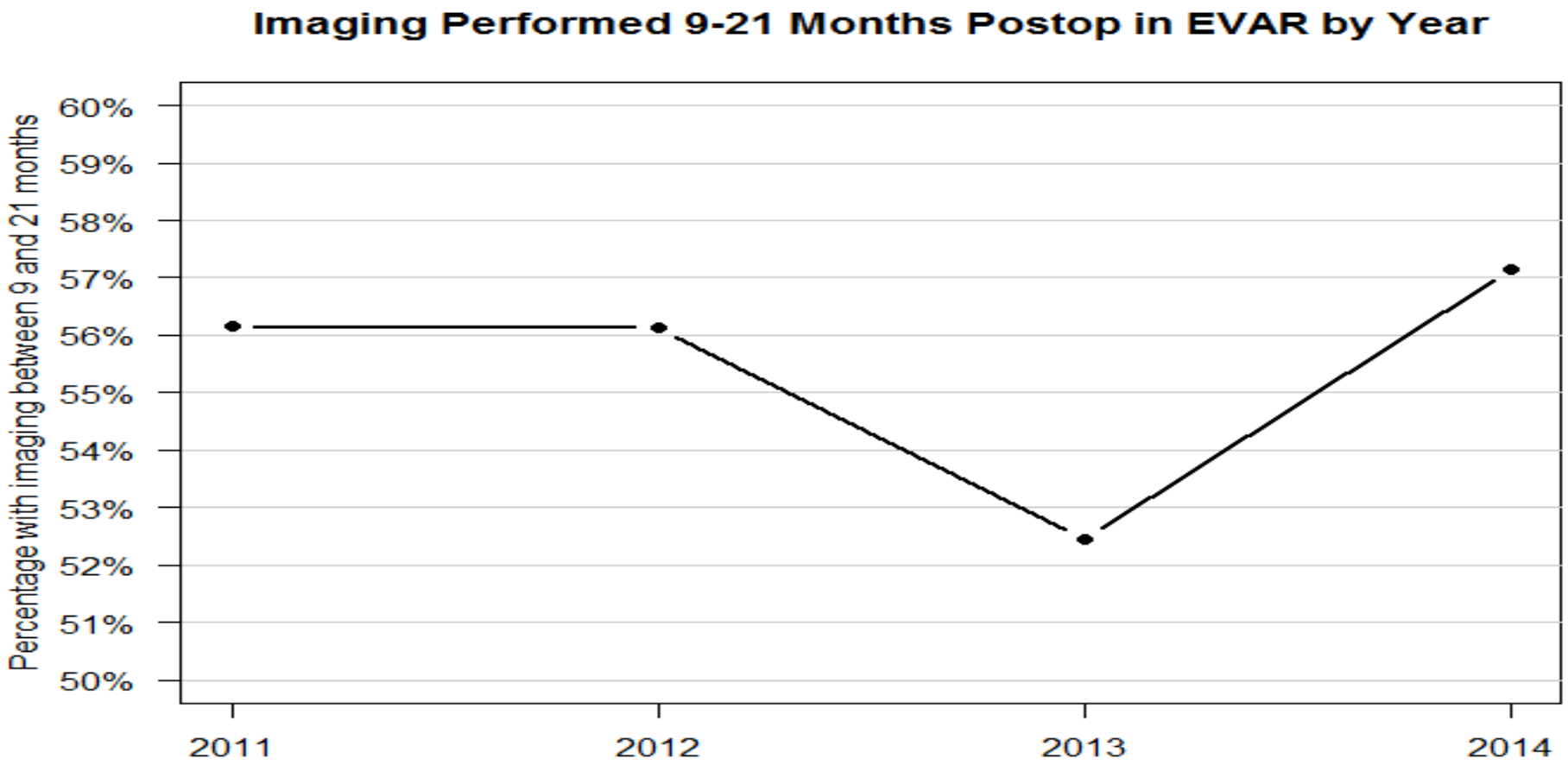
QI Webinar Series



SVS | PSO
PATIENT SAFETY ORGANIZATION

VQI EVAR LTFU Imaging

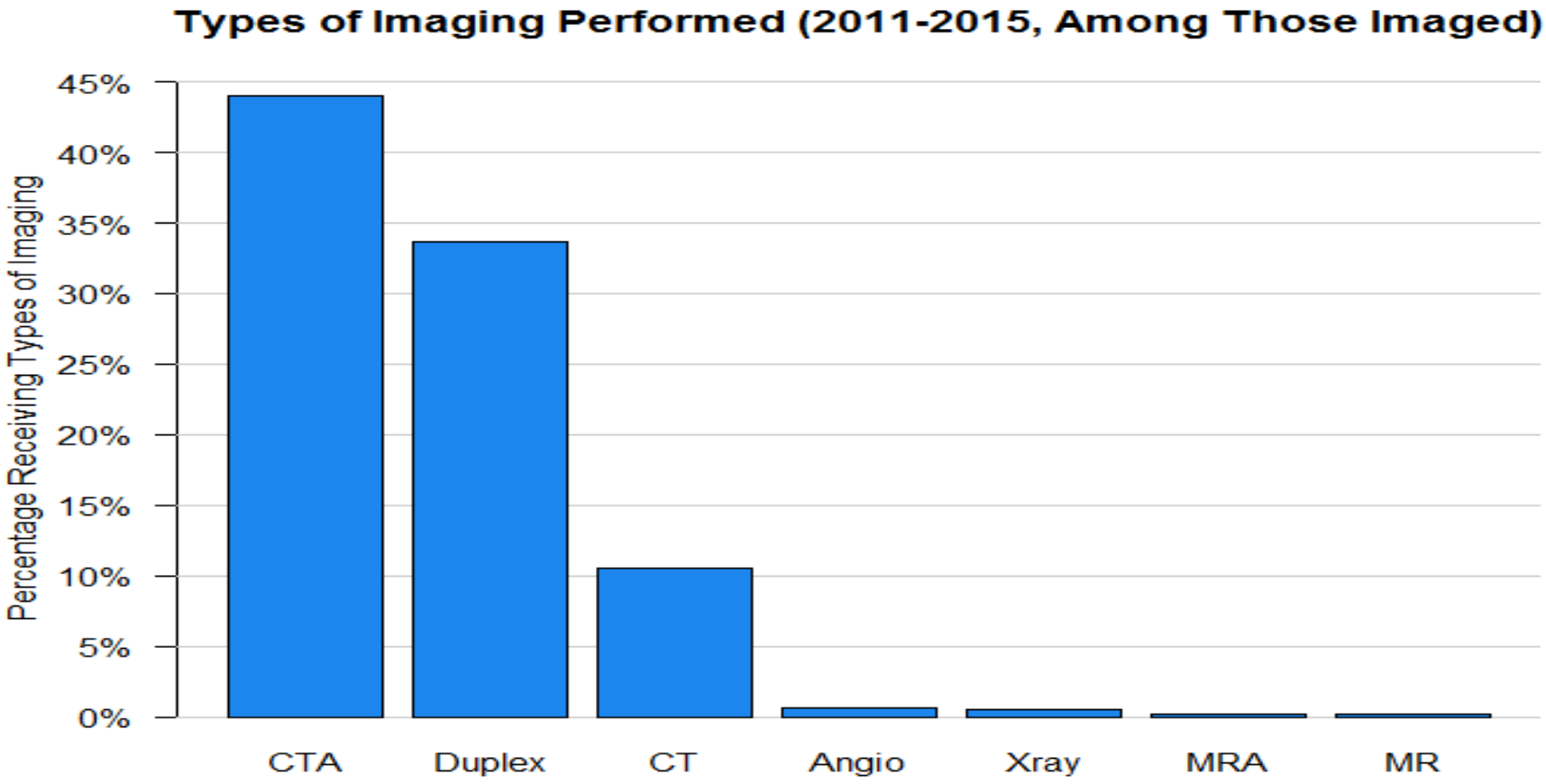
QI Webinar Series



SVS | PSO
PATIENT SAFETY ORGANIZATION

EVAR LTFU Imaging Modality in VQI

QI Webinar Series

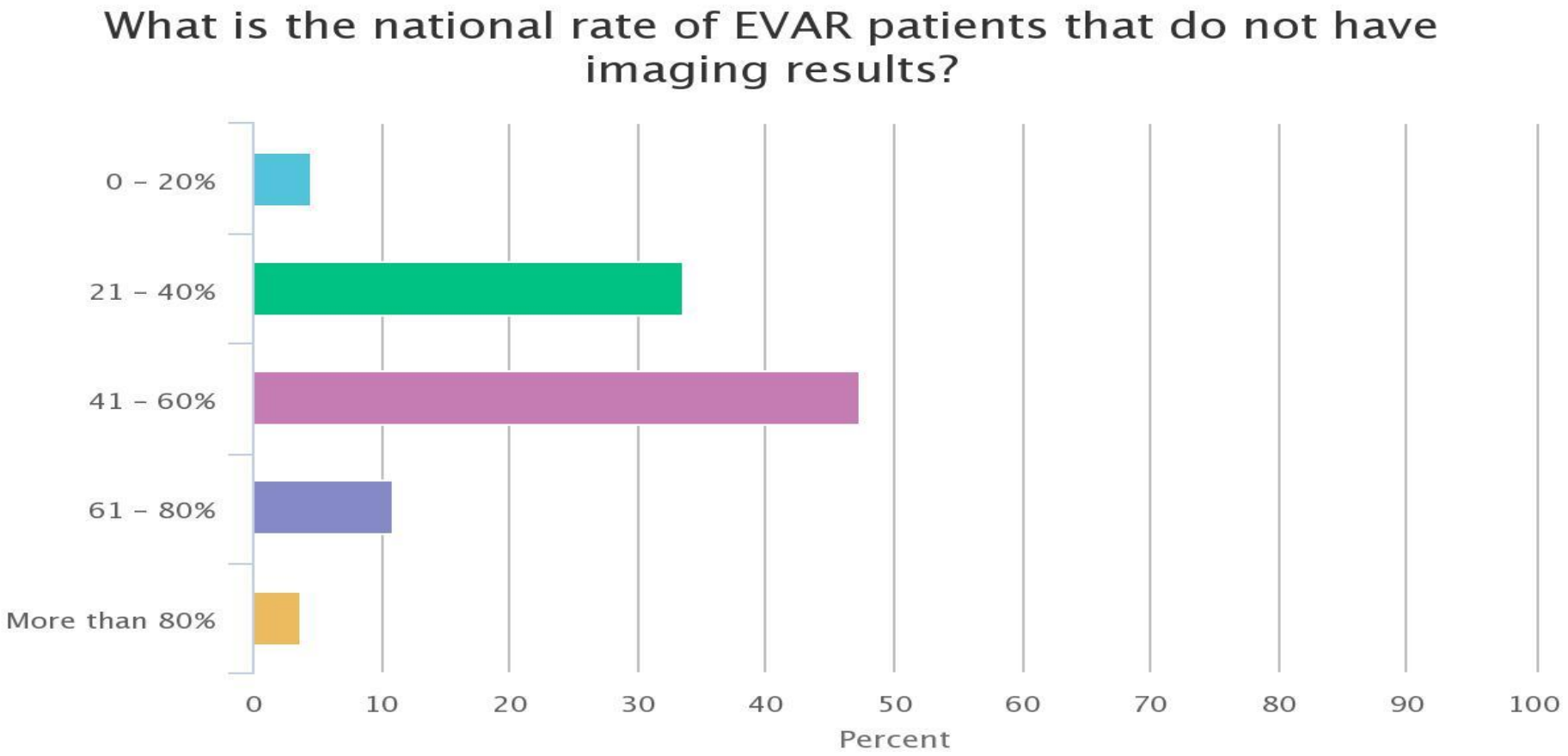


SVS | PSO
PATIENT SAFETY ORGANIZATION

Features Associated with Missing LTFU Imaging after EVAR in VQI

Variable	Not imaged (N=7959) 54%	Imaged (N=6852) 46%	P-value
Female	20%	18%	.005
Non-white race	10%	8%	.002
BMI	28.0	28.2	.01
Medicare	64%	62%	
Private insurance	30%	33%	<.0001
Non-home discharge	9%	5%	<.0001
Hospital transfer	9%	5%	<.0001
Current smoker	56%	44%	<.0001
History of Prior Aortic Surgery	5%	3%	<.0001
CHF	11%	10%	.007
COPD	32%	29%	<.0001
On hemodialysis preoperatively	1.2%	0.7%	.002
Not living at home preop	1.5%	1.0%	.006
Non-ambulatory preoperatively	8.5%	6%	<.0001
ASA 4 or 5	26%	23%	.0002
Non-elective admission	14%	10%	<.0001
Endoleak at case completion	22%	26%	<.00001

Question #5



SVS | PSO
PATIENT SAFETY ORGANIZATION

How do we improve?

Improve rates of postoperative EVAR surveillance

VQI National Initiatives

QI Webinar Series

FEBRUARY 2017

VASCULAR SPECIALIST

NEWS FROM SVS

SVS | VQI
VASCULAR QUALITY INITIATIVE

SVS PSO Launches 2 National Initiatives

The SVS Patient Safety Organization (SVS PSO) is launching two national initiatives aimed at improving patient care with a data-driven approach.

They are:

- Reminding vascular surgeons to prescribe anti-platelet agents and statins to vascular patients to improve long-term outcomes, led by Dr. Randall R. DeMartino, co-chair of the Vascular Medicine Registry.
- Promoting follow-up imaging at one year for endovascular aneurysm repair (EVAR) patients, led by Dr. Salvatore Scali, EVAR registry chair.

For both initiatives, the SVS PSO is creating toolkits and educational webinars for members, promoting best practices and offering comparative benchmarks. "We issue reports and registry data that show that certain practices can improve patients' outcomes," said Dr. Jens Eldrup-Jorgensen, SVS PSO medical director. "We also provide biannual data releases to help hospitals assess their performance over time and in comparison to other facilities nationally and within their region."

Discharge medications

For example, the Vascular Quality Initiative (VQI) released data last year on the impact of prescribing statins after discharge and how it improved patient outcomes. Patients on statins and antiplatelet agents had an impressive improvement in five-year survival rates compared to patients on neither medication, or on only one. Members found the data so compelling that the SVS PSO is expanding the initiative at the local and national levels.

Two components are essential for improvement: proper discharge planning and follow-up information and patient education/compliance.

"There are a number of ways that high-performing hospitals facilitate the process," said Dr. Adam Beck, chair of the Arterial Quality Committee. "Some have instituted new standing orders and reminders in their electronic medical records, or have nurse navigators work one-on-one with patients to make sure they have the appropriate prescriptions." It is critical that patients understand the importance of taking their medications before they leave the hospital and then maintain contact with their vascular surgeon, he said.

EVAR Long-term Follow-up Imaging

The second initiative emphasizes the importance of long-term follow-up care – with imaging as a crucial component – for EVAR patients.

"We feel surgeons should follow up close to 100 percent of their patients at one year after EVAR with imaging," said Dr. Eldrup-Jorgensen. "Currently those figures aren't as high as they should be."

The imaging – MRI, CT or ultrasound – at one year is vitally important to document the adequacy of the AAA repair, he said. Noninvasive imaging is critical to assessing the success of the aneurysm repair and determining the presence of an endoleak that might require re-intervention.

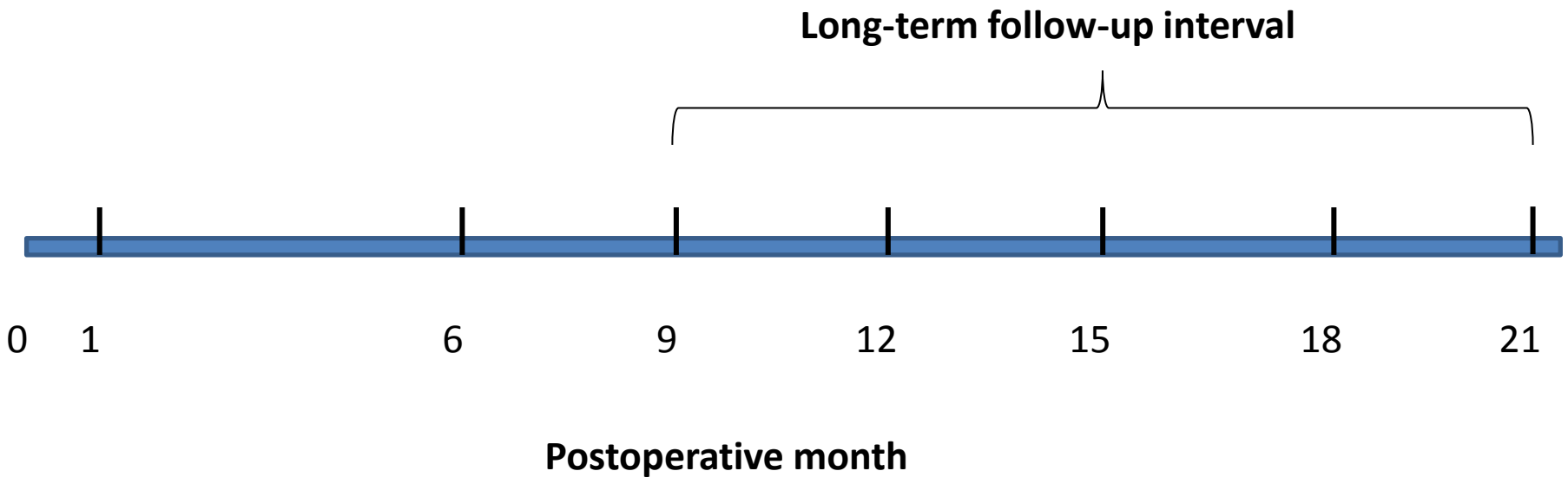
Both national quality initiatives require continuous effort and rely upon data to monitor the effectiveness of these efforts, said Dr. Beck. "We issue hospital and physician reports every six months; providers have to be conscious of checking their data to be sure quality improvements stay in place," he said. Information now being collected underscores the importance of developing and maintaining long-term relationships with patients – a practice SVS members not only embrace but also prize.

"It's exciting to know that VQI members are using this registry data to improve care," said Dr. Eldrup-Jorgensen. "The mission of VQI is to improve the care of the vascular patient and we are pleased that we can provide data that allows providers to improve their care and up their game."

For more information, contact Nadine Caputo, quality director, at ncaputo@svspso.org.

SVS | PSO
PATIENT SAFETY ORGANIZATION

Eligible window for LTFU



EVAR LTFU QI Project Strategy

- Focus Groups
- Webinar
- Questionnaire/Survey
- Pilot project
- Email blast/Push Report
- National Meeting
- Fall Regional Meeting
- Publication

Focus Groups

QI Webinar Series

Lessons Learned from High Performing VQI Centers With Excellent (≥80%) EVAR LTFU Imaging Surveillance

SVS | PSO
PATIENT SAFETY ORGANIZATION

EVAR LTFU Imaging Focus Group Discussion Highlights

Organizational Success Factors

- Strong relationships with physician private practices
- Physician leadership
- Staff person responsible for LTFU
- Patient education – early (pre-op) and often
- Communication of patient expectations (follow-up forever)

EVAR LTFU Imaging Focus Group Discussion Highlights

Processes that work at high performing centers

- Protocol for LTFU beginning at 9 months – 21 months post EVAR
- Multiple reminders/communication channels (letters, phone, texts, patient portals)
- Same day imaging and follow-up visits
- Automated tracking of missed visits
- Communication with multiple staff on LTFU status; monthly data runs

EVAR LTFU Imaging Focus Group Discussion Highlights

Challenges

- Transfer patients – out of area
- Tracking hard to reach patients: Facebook, obits, certified letters

COPI and Physician Reports

- In addition to the spring and fall regional reports, this year we have published three COPI reports:
  - 30-day stroke and 1-year mortality after CEA
  - 30-day stroke or 1-year mortality after CAS
  - COPI report on hematoma after PVI
- We have also published three surgeon-level reports:
  - Percentage of high-risk patients receiving CEA
  - Percentage of patients receiving follow-up imaging after EVAR
  - Surgeon-level report on percentage of high-risk patients receiving CAS
- 2017 Plan to repeat previous reports:
  - First one is CEA LOS