

## Best Papers from VQI – 2017

1. Lemmon GW, Neal D, DeMartino RR, et al. Variation in hospital costs and reimbursement for endovascular aneurysm repair: A Vascular Quality Initiative pilot project. *J Vasc Surg.* 2017;66(4):1073-1082.

In a unique project, investigators sought to merge the detailed clinical data of the VQI with hospital costs calculated from standard billing forms to allow a more accurate comparison of costs between centers for endovascular aneurysm repair. Eighteen centers used their VQI data and cost data from the UB-04. 782 procedures were included for analysis and mean costs ranged from \$31,100 to \$47,400. Significant variation was found in the hospital coding of the DRG. This study brings up several points: VQI can help inform accurate coding, and there is significant variation in implant costs and total costs exceed current Medicare reimbursement. This study shows the potential for data to influence policy.<sup>1</sup>

2. Venermo M, Wang G, Sedrakyan A, et al. Editor's Choice - Carotid Stenosis Treatment: Variation in International Practice Patterns. *Eur J Vasc Endovasc Surg.* 2017;53(4):511-519.

The authors sought to evaluate regional variation in the treatment of carotid disease with reference to guidelines established via prior randomized controlled trials. Data from the VQI and the European Vascunet registries were compared. Significant variation was found between countries in indication for operation, use of minimally invasive methods, and treatment of women and elderly patients. Most notable is the authors conclusion that treatment of asymptomatic patients was correlated with procedures in a country with a fee for service payment model. This study highlights the ability of data to inform decision making and potentially a platform for appropriateness criteria.<sup>2</sup>

3. Mehaffey JH, LaPar DJ, Tracci MC, et al. Modifiable Factors Leading to Increased Length of Stay after Carotid Endarterectomy. *Ann Vasc Surg.* 2017;39:195-203.

This study investigated the factors correlated with increased length of stay after carotid endarterectomy in a single institution from 2011 to 2014. 219 patients had complete 12-month follow-up. One-third of these had a length of stay over one day. Correlated factors included elevated creatinine, congestive heart failure, self-pay status and procedural complications. This study highlights factors which may result in reduced length of stay.<sup>3</sup>

4. Hicks CW, O'Kelly A, Obeid T, Locham S, Malas MB. Predicting failure to rescue after abdominal aortic aneurysm repair in elderly patients. *J Surg Res.* 2017;217:265-270.

Twelve years of abdominal aortic aneurysm repairs were evaluated for failure to rescue. Failure to rescue is being increasingly used as a quality measure. Failure to rescue is defined by the Agency for Healthcare Research and Quality as "Although not every complication of medical care is preventable, health care systems should be able to rapidly identify and treat complications when they occur." The authors defined failure to rescue for this study as deaths after complication of the aneurysm surgery.

Failure to rescue was correlated with female gender, multiple comorbidities, renal insufficiency, peripheral vascular disease and vasopressor use. Failure to rescue was more common in elderly patients (age > 80y).<sup>4</sup>

5. Brooke BS, Beck AW, Kraiss LW, et al. Association of Quality Improvement Registry Participation with Appropriate Follow-up After Vascular Procedures. *JAMA Surg.* 2017.

As with other registries, such as NSQIP, there is a frequent question if participation is enough to impact a quality metric. The authors evaluated over 3.2 million procedures from Medicare data to determine if VQI participation impacted procedural follow-up over a six-year period. As observed in other registry settings, participation alone does not correlate with effective follow-up. It appears that members must be engaged to improve performance. This study provides a starting point to evaluate factors that will impact patient follow-up.<sup>5</sup>

6. Woo K, Palmer OP, Weaver FA, Rowe VL, Society for Vascular Surgery Vascular Quality I. Use of completion imaging during infrainguinal bypass in the Vascular Quality Initiative. *J Vasc Surg.* 2015;61(5):1258-1263.

Completion imaging after infrainguinal bypass remains recommended but has had no effect on early outcome. The authors evaluated 14,140 lower extremity bypass procedures. The rate of completion imaging was only 43%. Significant practice variation was identified, as were several bypass characteristics. This paper makes an excellent starting point to standardize practice and critically evaluate the role of completion imaging.<sup>6</sup>

7. Teixeira PG, Woo K, Beck AW, Scali ST, Weaver FA, Society for Vascular Surgery VQI. Association of left subclavian artery coverage without revascularization and spinal cord ischemia in patients undergoing thoracic endovascular aortic repair: A Vascular Quality Initiative(R) analysis. *Vascular.* 2017;25(6):587-597.

Three years of patients undergoing thoracic endovascular aortic repair (n=2063) were divided into cohorts based on revascularization of the left subclavian. The outcome measure was the development of spinal cord ischemia. The authors found that almost 25% of patients undergoing thoracic endovascular aortic repair had coverage of the left subclavian. Of those patients with coverage of the left subclavian, 60% underwent revascularization. There was an incidence of spinal cord ischemia of 12.1% in the group without revascularization and 8.5% in the group who underwent revascularization.<sup>7</sup>

8. Zamor KC, Hoel AW, Helenowski IB, Beck AW, Schneider JR, Ho KJ. Comparison of Direct and Less Invasive Techniques for the Treatment of Severe Aorto-Iliac Occlusive Disease. *Ann Vasc Surg.* 2018;46:226-233.

This study evaluated patients who underwent either aorto-bifemoral bypass or aorto-unifemoral bypass (n=1094) as compared to cross femoral bypass or femoral endarterectomy with iliac stenting (n=711) from 2006 through 2013. The cohorts underwent propensity score matching to correct for the likelihood of a more invasive revascularization. The authors demonstrate that the more direct

approach had better 1-year primary patency, but there was no difference in limb salvage. As in other large data set studies, there may be some bias based on surgeon choice, and it is unclear that propensity score matching alone obviates that.<sup>8</sup>

9. Arhuidese IJ, Nejm B, Chavali S, et al. Endarterectomy versus stenting in patients with prior ipsilateral carotid artery stenting. *J Vasc Surg.* 2017;65(5):1418-1428.

This study evaluated patients who underwent carotid endarterectomy (n=1047) or carotid artery stenting (n=1816) after prior ipsilateral carotid stenting from 2003 – 2015. They evaluated outcomes for stroke, death, myocardial infarction, stroke/death, and stroke/death/ myocardial infarction. The authors identified higher mortality associated with re-operative carotid endarterectomy. However, the authors do not comment on if there was a difference in the percentage of patients considered to be at high (anatomic or physiologic) risk. The authors do identify ongoing smoking as a significant risk for poor outcomes.<sup>9</sup>

10. Zavatta M, Mell MW. A national Vascular Quality Initiative database comparison of hybrid and open repair for aortoiliac-femoral occlusive disease. *J Vasc Surg.* 2018;67(1):199-205 e191.

This study included patients who underwent aortoiliac revascularization of either open (n=879) or endovascular (n=1472) with common femoral endarterectomy from 2009 to 2015. The authors assessed 30-day mortality, length of stay, location of discharge and 1-year mortality, patency and ABI change and change in ambulation. They concluded that endovascular revascularization had improved short-term outcomes and freedom from amputation, whereas open revascularization had better long-term improvement in both ABI and ambulatory status. The biggest concern with this data is it may be subject to selection bias – not by the authors, but by the clinicians performing the revascularizations which is the source of the data.<sup>10</sup>

11. Gabel J, Jabo B, Patel S, et al. Smoking Habits of Patients Undergoing Treatment for Intermittent Claudication in the Vascular Quality Initiative. *Ann Vasc Surg.* 2017;44:261-268.

The authors report on the incidence of active smoking in patients undergoing revascularization (percutaneous, open infrainguinal and open suprainguinal). Almost 50% of patients undergoing revascularization were active smokers. The authors found multiple correlates (all between 1 and 1.2) for ongoing smoking (age greater than 70 had a prevalence ratio of 2.4). The article highlights the need for improvement in smoking cessation efforts.<sup>11</sup>

## REFERENCES

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