

Reducing Surgical Site Infection by Hospital-Specific Feedback to Improve Practice in the Multicenter Vascular Quality Initiative

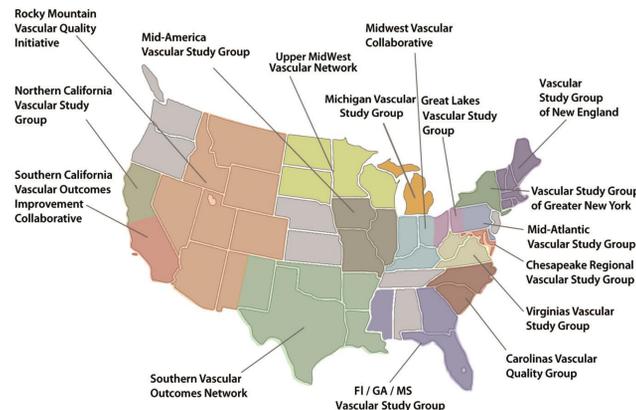
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Vascular Quality Initiative:

VQI is a national quality improvement network of 320 centers in 46 states organized as a Patient Safety Organization. Data are recorded for major vascular procedures using national registries.

18 Regional Quality Groups across the U.S.

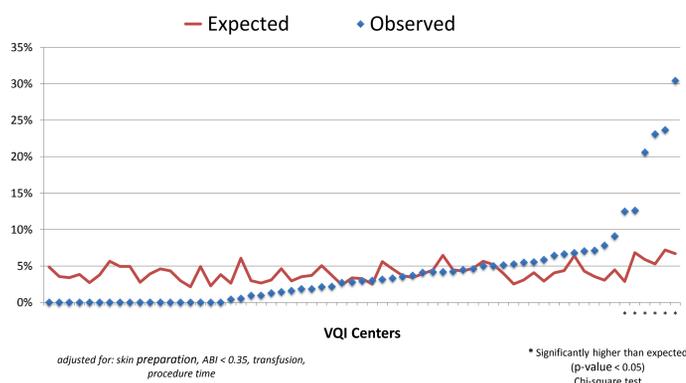
Regional Groups hold semi-annual meetings of physicians, nurses, researchers, and administration to discuss regional variations in patient selection, procedure selection, and outcomes, in order to develop regional quality improvement projects.



Improvement Opportunity:

Surgical site infection (SSI) after lower extremity bypass operations are a major cause of morbidity following these limb-saving procedures. We found substantial variation in SSI rate (0% to 32%) after 7,908 operations performed in 101 VQI centers from 2003 to 2012:

Surgical Site Infection Rate after Lower Extremity Bypass Observed and Expected by VQI Centers



Objective:

To identify factors associated with surgical site infection and communicate specific opportunities to VQI centers that could change practice and reduce surgical site infection rates.

Methods:

Multivariable logistic regression was used to identify modifiable processes of care associated with SSI. A Center Opportunity Profile for Improvement (COPI) report was sent to each center in December, 2012 indicating specific opportunities to reduce SSI based on identified risk factors. SSI rate was compared in 2012 vs. 2013 among 41 centers with at least 10 procedures per year.

Results:

Independent modifiable SSI predictors were:
Operative Transfusion >2 units PRBC (OR 3.3)
Procedure Time >220 minutes (OR 2.1)
Chlorhexidine Skin Prep (OR 0.53, Protective)

Center Opportunity Profile for Improvement Report

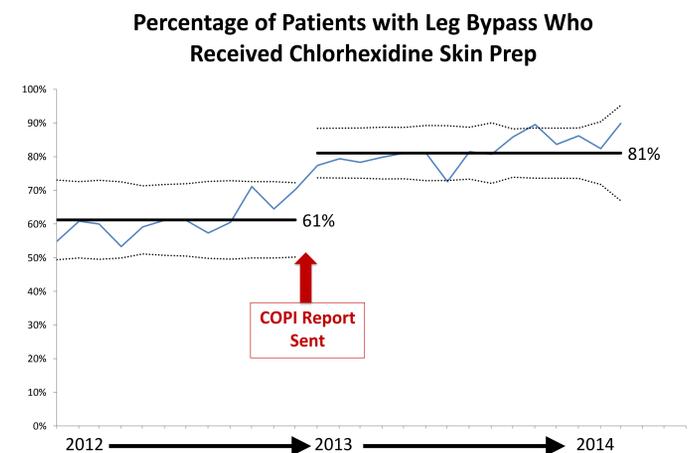
Each center was sent a COPI report in Dec, 2012 showing their SSI rate and their profile of these modifiable risk factors, highlighting opportunity for improvement. The example below shows a center with higher than expected SSI rate, and highlights the opportunity to increase chlorhexidine skin prep and reduce operative transfusions..

COPI Report Example:

COPI	VQI wound infection rate	3.6%	SVS PSO
Center Name			
Your center's number of procedures		21	
Your center's wound infection rate		28.6%	
Your center's wound infection expected rate		5.9%	
Observed rate vs. Expected rate	Rates significantly different p<0.01		
Predictors of wound infection			
VQI Average	Chlorhexidine Skin Prep	Transfusion ≥ 3 units	Procedure time > 220 minutes
	60%	5.8%	50%
	Higher is better	Lower is better	Lower is better
Your center	12%	15%	45%
Significantly higher infection rate than expected. Switch to Chlorhexidine. Reduce number of transfusions.			

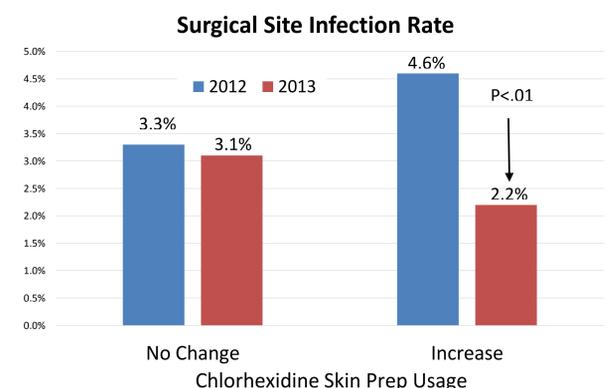
Practice Change Based on COPI Reports

In 2013, after the COPI reports, operative transfusion rates and procedure time did not change across VQI centers. However, chlorhexidine skin prep, which is more easily modified, increased from 61% to 81% among 5,342 procedures performed in 101 centers.



Improved Outcomes in Centers that Changed Practice

After COPI reports were received, 12 of 16 centers with low chlorhexidine usage substantially increased chlorhexidine use from 2012 to 2013 (from 24% to 95% of procedures). Among these centers, SSI rate decreased significantly, while it did not change in other centers, as shown below:



Conclusion

The Vascular Quality Initiative generated new knowledge that operative skin prep could reduce surgical site infection. When distributed to sites in an actionable COPI report, this stimulated rapid practice change in 75% of centers with low chlorhexidine usage, which resulted in reduced surgical site infection rates in these centers. COPI reports appear to be an effective method to translate registry data into practice change within a national quality initiative.