



Improving the Quality and Cost of Surgical Care

What the Research Tells Us

Improving the quality of surgical care is a national priority, as surgical care comprises approximately 40 percent, or \$500 billion, of hospital and physician healthcare dollars.¹ Furthermore, when patients experience surgical complications, the costs of care increase on average by 93 percent.² The Michigan Surgical Quality Collaborative (MSQC) is a regional collaborative dedicated to decreasing complications, improving outcomes, and enhancing the cost-effectiveness of general and vascular surgery. Founded in 2005 under the sponsorship of Blue Cross Blue Shield of Michigan and Blue Care Network and led by Dr. Darrell Campbell Jr., the MSQC focuses on improving care before, during, and after surgery by reducing common surgical complications. The MSQC compiles hospital- and physician-level clinical data³ from 66 Michigan hospitals and identifies high-performing sites within the collaborative. High-performing sites are then visited to identify best practices for improving surgical outcomes and reducing costs.⁴ Best practices are disseminated to member hospitals, along with de-identified, aggregated reports of performance metrics based largely on short-term morbidity and mortality.⁵ This peer-to-peer learning network allows hospitals to assess their performance and address the identified areas for quality improvement.

The MSQC also uses the vast data collected by the collaborative to contribute to the research on improving surgical quality. Some MSQC research has focused on best practices to reduce the incidence of surgical site infection (SSI) following colorectal surgery. Up to 11 percent of patients who undergo colorectal surgery each year develop an SSI. For each patient, this added morbidity leads to an average of nine additional days in the hospital and approximately \$18,000 per episode, resulting in an

annual cost of approximately \$315 million. Due to the high prevalence and cost of SSIs following colon surgery, the MSQC has focused on reducing such infections.⁶ Researchers utilized the MSQC data to identify six perioperative care practices independently associated with decreased risk of SSI after colectomy, including: appropriate selection of intravenous antibiotics; maintenance of patient body temperature and blood glucose following surgery; use of oral antibiotics when preparing the bowel for surgery; performance of minimally invasive surgery, and short (less than 100 minutes) duration of surgery.⁷

Although these practices were shown to be effective when implemented individually,⁸ previous study results were mixed on whether joint implementation of the practices as a colectomy “bundle” would further improve outcomes. Dr. Campbell and the MSQC team found a strong association between increased compliance with the colectomy bundle and lower incidence of SSI.⁹ Prior literature had not decisively concluded that bundling surgical interventions could reduce the risk of SSI. With this study, however, Dr. Campbell and the MSQC team demonstrated the potential effectiveness of such an initiative. Highlighting this association provides a rationale for the future implementation of quality improvement measures that involve bundling to reduce SSI.

The extensive work of the MSQC in reducing SSI following colectomy is only one example of the significant impact the collaborative has had on research and practice. MSQC data has also highlighted the high mortality rates of elderly patients undergoing emergent surgery compared to that of younger patients. Furthermore, the study identified the need to decrease the number of deaths due to surgical complications among this population. Researchers also suggested potential best practice measures including early recognition and management of major complications, as well

1 J.D. Birkmeyer, C. Gust, O. Baser, J.B. Dimick, J.M. Sutherland, and J.S. Skinner. 2010. Medicare payments for common inpatient procedures: implications for episode-based payment bundling. *Health Services Research* 45(6 Pt 1): 1783–95.

2 D.A. Share, D.A. Campbell, N. Birkmeyer, R.L. Prager, H.S. Gurm, M. Moscucci, M. Udow-Phillips, and J.D. Birkmeyer. 2011. How a Regional Collaborative of Hospitals and Physicians in Michigan Cut Costs and Improved the Quality of Care. *Health Affairs* 30(4): 636–645.

3 Ibid.

4 The Michigan Surgical Quality Collaborative. http://www.msqc.org/about_program_overview.php [accessed 10/17/14].

5 D.A. Share, D.A. Campbell, N. Birkmeyer, et al. 2011. How a Regional Collaborative of Hospitals and Physicians in Michigan Cut Costs.

6 S. Hendren, D. Fritze, M. Banerjee, J. Kubus, R.K. Cleary, M.J. Englesbe, and D.A. Campbell. 2013. Antibiotic choice is independently associated with risk of surgical site infection after colectomy: a population-based cohort study. *Annals of Surgery* 257(3): 469–75.

7 S.A. Waits, D. Fritze, M. Banerjee, W. Zheng, J. Kubus, M.J. Englesbe, D.A. Campbell, and S. Hendren. 2014. Developing an argument for bundle interventions to reduce surgical site infection in colorectal surgery. *Surgery* 155(4): 602–606.

8 D.A. Share, D.A. Campbell, N. Birkmeyer, et al. 2011. How a Regional Collaborative of Hospitals and Physicians in Michigan Cut Costs.

9 S.A. Waits, D. Fritze, M. Banerjee, et al. 2014. Developing an argument for bundle interventions.

as the coordination of care among surgeons, hospital administrators, and payers to tailor care to geriatric patients.¹⁰ Additionally, the MSQC has linked tumor registry and quality improvement data to implement a hospital-based quality assessment program aimed at improving the quality of care provided in the treatment of rectal cancer. The success of this program when implemented in ten MSQC member hospitals provides a framework for other organizations interested in assessing and improving the quality of care for rectal cancer.

Impact of the Research

Dr. Campbell and the MSQC team have had significant impact on surgical care management in Michigan and beyond. The improvements made by hospitals participating in the MSQC have resulted in \$20 million in savings, far exceeding the \$5 million annual cost of administering the collaborative. Additionally, from 2005 to 2009, risk adjusted, 30-day surgical morbidity rates for hospitals participating in the MSQC decreased from 13.1 percent to 10.5 percent—an overall 20 percent reduction. In comparison, the morbidity rates of hospitals outside of the MSQC remained flat from 2005 to 2008 before

decreasing slightly in 2009. The most recently available data shows that 30-day surgical morbidity rates were significantly lower in MSQC hospitals than in non-MSQC hospitals (10.5 percent and 11.5 percent, respectively).¹¹ In addition to these significant improvements in surgical outcomes and substantial cost savings, the MSQC has also gained national attention, as evidenced by its winning a \$6.4 million Health Care Innovation Award from the Centers for Medicare and Medicaid Services. This award will help the MSQC serve as the infrastructure for the development of an evidence-based surgical model that will transform surgical care in Michigan and nationally by improving outcomes and reducing costs.

Researcher Profile

Dr. Darrell Campbell Jr., M.D., is Chief Medical Officer at the University of Michigan Health System and a professor in the Department of Surgery. To learn more about Dr. Campbell and the MSQC team, please see: <http://www.msqc.org/index.php>.

¹⁰ K.H. Sheetz, S. A. Waits, R.W. Krell, D.A. Campbell, M.J. Englesbe, and A.A. Ghaferi. 2013. Improving mortality following emergent surgery in older patients requires focus on complication rescue. *Annals of Surgery* 258(4): 614-7; discussion 617-8.

¹¹ D.A. Share, D.A. Campbell, N. Birkmeyer, et al. 2011. How a Regional Collaborative of Hospitals and Physicians in Michigan Cut Costs.



Established in 2011, the University of Michigan Institute for Healthcare Policy and Innovation is the nation's leading university-based collaborative of health services researchers evaluating how healthcare works and how it can be improved, and advising policy makers to inform change. The institute's more than 425 faculty span 12 U-M schools and colleges across multiple disciplines including medicine, public health, engineering, nursing, business, public policy, social work, law, and others. Learn more at www.ihpi.umich.edu

The University of Michigan is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools, 30 North LaSalle Street, Suite 2400, Chicago, Illinois 60602-2504. Phone: (800) 621-7440; (312) 263-0456; Fax: (312) 263-7462.

A Non-discriminatory, Affirmative Action Employer

Authors: Ndukwe, Ezinze G.; Smiley, Mary; Campbell, Darrell Jr.; Udow-Phillips, Marianne; Kerr, Eve. Improving the Quality and Cost of Surgical Care. November, 2014. The University of Michigan Institute For Healthcare Policy and Innovation. Ann Arbor, MI.

Executive Officers—University of Michigan Health System: Michael M.E. Johns, M.D., Interim Executive Vice President for Medical Affairs; James O. Woolliscroft, M.D., Dean, U-M Medical School; T. Anthony Denton, J.D., MHA, Acting Chief Executive Officer, U-M Hospitals and Health Centers; Kathleen Potempa, Ph.D., Dean, School of Nursing.

Regents of the University of Michigan: Mark J. Bernstein, Julia Donovan Darlow, Laurence B. Deitch, Shauna Ryder Diggs, Denise Ilitch, Andrea Fischer Newman, Andrew C. Richner, Katherine E. White, Mark S. Schlissel, *ex officio*.

© 2014 Regents of the University of Michigan.

In Partnership with



Center for Healthcare Research & Transformation
2929 Plymouth Road, Suite 245
Ann Arbor, MI 48105-3206
Phone: 734-998-7555
chrt-info@umich.edu • www.chrt.org



2800 Plymouth Road,
Building 16, 1st Floor
Ann Arbor, MI 48109
Phone: 734-998-8200
www.msqc.org