Thank you for joining us today!
12-1:00pm ET, April 29th, 2015

An Approach to Clinical Practice
Variations in Care: ACS-NSQIP

We will begin shortly
Please turn on your computer speakers to hear today’s session.

If you do not hear music, then please confirm your computer speakers are on and check that your volume is not muted.

If you do not have computer speakers, then please dial 1-855-856-8710 to listen to the English audio.
An Approach to Clinical Practice Variations in Care: ACS-NSQIP

Speakers:

Dr. Tim Jackson
Co-Chair, NSQIP-On Steering Committee, General Surgeon, University Health Network

Lila Gottenbos
Surgical Clinical Reviewer, NSQIP, Langley Memorial Hospital

Host:

Stephen Samis
Vice-President, Programs, Canadian Foundation for Healthcare Improvement
TODAY’S SESSION OBJECTIVES

• Review an example of a data-driven QI program in surgery: ACS-NSQIP

• Highlight the process undertaken to establish and spread ACS-NSQIP in BC, and share some of the preliminary outcomes from select sites

• Outline how ACS-NSQIP is helping to improve the quality of surgical care at University Health Network (UHN) in Toronto and demonstrate how it links to the Quality Strategy in Ontario

• Highlight opportunities in the Canadian context
Our Mission
Accelerating healthcare improvement and transformation for Canadians

Our Vision
Timely, appropriate, efficient and high-quality services that improve the health of Canadians

Canadian Foundation for Healthcare Improvement (CFHI)

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CFHI’s Goals

Healthcare Efficiency
• Maximize value for money in healthcare spending

Patient- and Family-Centred Care
• Improve patient and family experience and outcomes

Coordinated Healthcare
• Provide a more coordinated approach to address complex health needs
CFHI Improvement Model™

SHORT TERM

CFHI
Organizational Commitment and Collaborative Leadership to Accelerate Healthcare Improvement
Builds Improvement Capacity
Supports Improvement Initiatives
Tailored learning
Collaborations and networking
Improvement advice and coaching
Analysis of evidence

DELIVERS
Leaders’ ability to
- Assess the problem using evidence
- Design innovative solutions
- Implement the change
- Evaluate the difference it makes

SUPPORTS
Provider practices
Patient engagement
Organizational culture and practices
Policies and incentives

ENABLES IMPROVEMENTS IN
Patient experience and coordination of care
Health outcomes and efficiency

SPREADS
Expertise and best practices within and across organizations, regions and provinces/territories

IMPROVES
Healthcare system performance
- Maximizing value for money in healthcare spending
- Improving patient experiences and outcomes
- Providing a more coordinated approach to complex health needs

The health of Canadians

MEDIUM TERM

LONG TERM

IMPROVEMENT PRINCIPLES
Improvement requires engaging stakeholders in a process of change based on six assumptions.

1) Healthcare delivery should be patient-centred and population-based
2) Strategy should be informed by evidence and experience
3) Design and implementation should engage a wide range of stakeholders
4) Design and implementation should take a participative approach
5) Large scale improvement can be achieved through an incremental process
6) Improvement is a collective learning process that builds on carefully evaluated experimentation and critically assessed potential solutions

ACTION LEVERS TO ACCELERATE HEALTHCARE IMPROVEMENT
Improvement in healthcare requires initiative in the following six areas:

1) Promoting evidence-informed decision-making
2) Engaging patients and citizens
3) Building organizational capacity
4) Creating supportive policies and incentives
5) Engaging healthcare executives, managers and providers in creating an improvement culture
6) Focusing on population health needs

* Leaders include healthcare executives, managers and providers.

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SIX LEVERS FOR ACCELERATING HEALTHCARE IMPROVEMENT
THE NATIONAL SURGERY QUALITY IMPROVEMENT PROGRAM:

INTRO TO NSQIP-ON

Timothy Jackson BSc, MD, MPH, FRCSC, FACS
Division of General Surgery,
University Health Network, Toronto, ON

Surgical Lead, NSQIP-ON Program
Health Quality Ontario
Objectives

1) Provide an overview of NSQIP

1) Update on how NSQIP can be used to address variations in care.

1) Highlight some opportunities in Ontario
What is the National Surgery Quality Improvement Program (NSQIP)?

ACS-NSQIP is a data-driven, risk-adjusted, outcomes-based program to measure and improve the quality of surgical care.

Benefits include:

- Improved patient care and outcomes
- Decreased healthcare costs
Data: A Quality Diagnostic Tool
Good Data: Allows for meaningful comparisons of surgical outcomes

Different: Hospitals, Patients, Surgeries

Statistical Model
- Risk Adjustment for patient and case mix
- Shrinkage Adjustment

Site Level Quality Metrics
Benchmarking → High quality data allows for risk adjustment and comparison of observed-to-expected (O/E) ratios for each hospital:

- **Low Outlier**: If the upper bound of the O/E confidence interval is \(<1.0\), the hospital’s outcomes are statistically **better** than expected.

- **High Outlier**: If the lower bound of the O/E ratio is \(>1.0\), the hospital’s outcomes are statistically **worse** than expected.

Benchmarking can identify areas for targeted quality improvement.
Continuous Quality Improvement

Targeted Quality Improvement

Collection of High Quality Data

Feedback/Action

Risk Adjustment

Benchmarking to other Hospitals
Benefits in Participating Hospitals

118 Private Sector Hospitals 2005-2007:

- 66% improved risk adjusted mortality
- 82% improved risk adjusted morbidity
- Both poor performing and well performing hospitals demonstrated improvement

Estimated to be 250 – 500 complications, 12-36 deaths per year for average large ACS NSQIP hospital
Sustained Improvements Over Time

Improved Surgical Outcomes for ACS NSQIP Hospitals Over Time

Evaluation of Hospital Cohorts With up to 8 Years of Participation

Mark E. Cohen, PhD,* Yaoming Liu, PhD,* Clifford Y. Ko, MD, MS, MSHS, FACS,*† and Bruce L. Hall, MD, PhD, MBA, FACS*‡

Ann Surg 2015

515 Hospitals 2006-2013:

- 2,941,845 surgeries
- Participation in NSQIP is associated with reductions in adverse events after surgery
- Magnitude of the QI increases with time in the program.

Conservative Estimate:
After 5 years, hospitals avoiding 14 deaths, 300 hundred complications, 132 SSI’s
2011 - 24 hospitals enrolled NSQIP
2012 - first risk-adjusted reports, identified QI targets – UTI, SSI, Pneumonias, & others
2013 - significant/measureable improvements
2014 – Most BC Hospitals enrolling

(http://bcpsqc.ca/clinical-improvement/sqan)
Using NSQIP in BC to Improve Care…
The National Surgical Quality Improvement Program in BC

3.5 years after start-up

Is it worth it?

April 2015
WHY did we invest in NSQIP?
ACS NSQIP is a measurement program that allows hospitals to accurately assess complication rates.

The majority of the 24 BC NSQIP sites began data collection in spring/summer 2011.

Risk adjustment – the hallmark of NSQIP – permits side by side comparisons between all hospital enrolled in the program, not just those with similar surgical and patient characteristics.

Many sites used their first complete risk adjusted report (July 2012) to identify areas for improvement and began work assembling teams and acting on the data.
BC In the beginning...

- 2011 - 2012: Expansion of NSQIP to 24 hospitals
- First 12 months – data cleaning, CPT code interpretation, and training Surgical Clinical Reviewers
- Site visits
- Province –wide webex learning sessions
- Surgeon Champion ($10,000 paid by most health authorities)
Fraser Health in the beginning...

- First 12 month – hiring, physical set up of new sites, training of new staff, standardization of workflow
- Recruitment of Surgeon Champions for all sites
- Getting the word out – NSQIP is here!
- Are we alone?
Site Set up

- Hiring of new staff
  - Job descriptions, qualifications.
- Physical office space
  - Procurement of space
  - Equipment
  - Setting up computer programs
- Training new staff
- Standardization of workflow
- Recruiting Surgeon Champion
Where do we fit with the rest of BC?
BC Working Group

• Formation of the BC Working Group in 2012
  – 1 group representing the BC perspective to NSQIP

• Development of an inter-provincial network
  – Cross hospital and cross health authority collaboration

• Hosting of sections of Webex sessions
  – Hot topics, FAQ’s, etc.

• In-person meetings
  – Detailed case study sessions
  – Interactive learning
NSQIP start in BC
SQAN the Challenge!
Action UTI
SAR Limited Data
Drilling Down
First SAR!
It's Real!
Sites seeing UTI improvements
Raw data
Benefit Analysis
Act Now!
SAQ 14 Hospitals
SCR Skill Building

Annual Conference • Workshops - average 3 annually • Monthly Teleconference Calls
Urinary Tract Infections Make a Difference to Patients!

The NSQIP average for urinary tract infections is 1.3%. Ten BC hospitals have dropped their collective UTI rates from 3% before April 2012 to 2.25% in 2013. UTIs in these hospitals has decreased from a combined average of 39 events per month before April 2013 to 31.5 events per month after April 2013.
Costs Saved of Urinary Tract Infections

- Cost estimates associated with UTIs vary from $1000 to $12,000 (1)
- A conservative estimate of costs saved over these 12 hospitals is $100,000-$200,000 (2)
- UTI is a relatively simple problem, fairly straightforward to address with smaller cost benefits

(1) Costs estimates from ACS NSQIP risk calculator [LINK]
(2) The Economics of Patient Safety in Acute Care Etchells et al. July 9, 2012 [LINK]
LMH UTI (All Cases)

<table>
<thead>
<tr>
<th>SAR Date</th>
<th>Data point</th>
<th>Decile</th>
<th>Outlier Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 2011 – Dec 2011</td>
<td>1.66</td>
<td>9</td>
<td>High</td>
<td>Needs Improvement</td>
</tr>
<tr>
<td>July 2011 – Jun 2012</td>
<td>1.59</td>
<td>9</td>
<td>High</td>
<td>Needs Improvement</td>
</tr>
<tr>
<td>Jan 2012 – Dec 2012</td>
<td>1.47</td>
<td>8</td>
<td>High</td>
<td>Needs Improvement</td>
</tr>
<tr>
<td>July 2012 – Jun 2013</td>
<td>1.37</td>
<td>8</td>
<td></td>
<td>As expected</td>
</tr>
<tr>
<td>Jan 2013 – Dec 2013</td>
<td>1.19</td>
<td>7</td>
<td></td>
<td>As expected</td>
</tr>
<tr>
<td>July 2013 – Jun 2014</td>
<td>1.34</td>
<td>8</td>
<td></td>
<td>As expected</td>
</tr>
</tbody>
</table>
## Cost of NSQIP per site

(1650 cases reviewed per year)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>NSQIP license</th>
<th>Surgeon Champion</th>
<th>Surgical Clinical Reviewers (1 – 2 FTE)</th>
<th>QI Support (.5 FTE)</th>
<th>Data Clerk (.5 FTE)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1 (per site)</td>
<td>$ 24,000</td>
<td>$ 10,000</td>
<td>$ 120,000 – 240,000</td>
<td></td>
<td></td>
<td>$ 154,000 – $ 274,000</td>
</tr>
<tr>
<td>Year 2 and onward (per site)</td>
<td>$ 24,000</td>
<td>$ 10,000</td>
<td>$ 120,000 – 240,000</td>
<td>$ 60,000</td>
<td>$ 35,000</td>
<td>$ 214,000 – $ 334,000</td>
</tr>
</tbody>
</table>

* If a site is tertiary care facility; then patient complexity often goes up which results in increased time for chart abstraction by the SCRs (compared to a smaller hospital)
## Langley Memorial Hospital
### Cost Avoidance 2011 - 2014

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cost Avoidance Total over Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UTI</strong></td>
<td>$382,435.20</td>
</tr>
<tr>
<td><strong>Pneumonia</strong></td>
<td>$215,119.80</td>
</tr>
<tr>
<td><strong>Superficial SSI</strong></td>
<td>$284,094.72</td>
</tr>
<tr>
<td><strong>Deep / Organ Space SSI</strong></td>
<td>$571,604.04</td>
</tr>
<tr>
<td><strong>Program Costs</strong></td>
<td>$(910,000)</td>
</tr>
<tr>
<td><strong>Total Cost Avoidance</strong></td>
<td>$543,253.76</td>
</tr>
</tbody>
</table>
The Other Big Opportunity: Surgical Site Infection

Most frequently flagged area that needs improvement

They are multi-factoral

This adverse event take longer to reduce
Ingredients for Success

• Effective Leadership!
• Local Surgical Quality Councils to review data
• Non risk adjusted results acted upon
• Paid physician champions
• Hands on physicians
• Strong Surgical Clinical Reviewers (with both data analysis and change management skills)
• Multidisciplinary teams on the units and OR
• Quality Improvement Support essential (can also be the SCR)
Lessons Learned

• It takes time to set up for success; patience is challenging!
• Engagement at all levels accelerates change
• SAR’s motivate
• Acting on non-risk adjusted data is key
• Collaboration and idea sharing can provide new insight to an old problem
“NSQIP has confirmed that unless there is clinical leadership and a culture for change; the program will fail. It is the action that makes NSQIP worth it.”

Doug Cochrane, MD
Thank You!

Lila Gottenbos  
lila.gottenbos@fraserhealth.ca

Kimberly McKinley  
kmckinley@bcpsqc.ca

- Thanks to Kimberly McKinley, BCPSQC, for providing BC / SQAN slides.
Back to Ontario...
Measurable Improvements in Care: Morbidity & SSI:

Q3/4 2012
Two recent JAMA articles using large administrative data sets (UHC and Medicare) – no association between participation in NSQIP and improved outcomes…

Outcomes reporting alone does not provide clear mechanisms for QI
Data Alone Isn’t Enough…

Data

Information

Improvement
Collaboration Accelerates QI

**Michigan Surgical Quality Collaborative:**

- 2005, 66 hospitals
- 2.6% reduction in complications
- 2500 complications avoided, 20 Million dollars saved
- Hospitals participating in the collaborative improved care more quickly compared to those participating in NSQIP alone.

(Share et al, Health Aff, 2011)

- At present >20 Regional Collaborative recognized/supported by NSQIP
Regional Collaboratives

10 NSQIP hospitals, 2008-2010 demonstrated a measurable reduction in many complications (SSI, Renal Failure, Prolonged Ventilation)
Net costs avoided = 2.2 Million Dollars / 10000 general surgical procedures

54 NSQIP hospitals, 2011-2012, 14.5% reduction in post-op occurrences (targets were UTI, SSI, Colorectal, Elderly),
Net costs avoided = 6.6 Million Dollars

Using the National Surgical Quality Improvement Program and the Tennessee Surgical Quality Collaborative to Improve Surgical Outcomes
Oscar D Guillamondegu, MD, MPH, FACS, Oliver L Gunter, MD, FACS, Leonard Hines, MD, FACS, Barbara J Martin, RN, MBA, William Gibson, MD, P Chris Clarke, RN, BSN, William T Cecil, MBA, Joseph B Cofer, MD, FACS

Macro vs Micro Level Surgical Quality Improvement: A Regional Collaborative Demonstrates the Case for a National NSQIP Initiative
Joseph J Tepas III, MD, FACS, Andrew J Kerwin, MD, FACS, Jhun deVilla, MD, Michael S Nussbaum, MD, FACS

(J Am Coll Surg, 2012)

(J Am Coll Surg, 2014)
NSQIP-ON Program

• An ACS-NSQIP Collaborative:
  – Partnership between HQO and 19 hospitals
  – 18 month “run-in”
  – Academic, Community, and Rural hospitals

• Objectives: (Improve Surgical Care in Ontario)
  1. Increase number hospitals and surgeons participating in QI activity
  2. Identify opportunities to support QI within a community of practice
  3. Evaluate impact on quality and effectiveness of QI interventions.
<table>
<thead>
<tr>
<th>Hospital</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collingwood General and Marine Hospital</td>
<td>Collingwood, Ontario</td>
</tr>
<tr>
<td>Grand River Hospital</td>
<td>Kitchener, Ontario</td>
</tr>
<tr>
<td>Grey Bruce Health Services</td>
<td>Owen Sound, Ontario</td>
</tr>
<tr>
<td>Groves Memorial Community Hospital</td>
<td>Fergus, Ontario</td>
</tr>
<tr>
<td>Halton Healthcare Services</td>
<td>Oakville, Ontario</td>
</tr>
<tr>
<td>Hamilton Health Sciences</td>
<td>Hamilton, Ontario</td>
</tr>
<tr>
<td>North Bay Regional Health Centre</td>
<td>North Bay, Ontario</td>
</tr>
<tr>
<td>Ottawa Hospital</td>
<td>Ottawa, Ontario</td>
</tr>
<tr>
<td>Peterborough Regional Health Centre</td>
<td>Peterborough, Ontario</td>
</tr>
<tr>
<td>Queensway Carleton Hospital</td>
<td>Ottawa, Ontario</td>
</tr>
<tr>
<td>Renfrew Victoria Hospital</td>
<td>Renfrew, Ontario</td>
</tr>
<tr>
<td>Sioux Lookout Meno Ya Win Health Care</td>
<td>Sioux Lookout, Ontario</td>
</tr>
<tr>
<td>Sunnybrook Health Sciences Centre</td>
<td>Toronto, Ontario</td>
</tr>
<tr>
<td>Thunder Bay Regional Health Sciences Centre</td>
<td>Thunder Bay, Ontario</td>
</tr>
<tr>
<td>University Health Network</td>
<td>Toronto, Ontario</td>
</tr>
<tr>
<td>Winchester District Memorial Hospital</td>
<td>Winchester, Ontario</td>
</tr>
</tbody>
</table>
Ontario Surgical Quality Improvement Network

What is the Ontario Surgical Quality Improvement Network?
The Ontario Surgical Quality Improvement Network is a community of hospitals committed to improving surgical care and patient safety. Participation in the Network will help to support surgical quality improvement in your organization and accelerates the achievement of long-term quality improvement goals.

How does it work?

Data
Hospital-level surgical data will be used to identify opportunities for improvement and common barriers to change (NSQIP)

Evidence
Based on the data, clinical guidelines and best practices will be developed to facilitate evidence-based quality improvement

QI Interventions
Member organizations lead the development of quality improvement initiatives, based on data, evidence and identified priorities i.e. ERAS/BPIGS

Delivery
With the support of their peers in the Network, organizations implement evidence-based quality improvement programs

Who is involved?

Oversight Committee
• Health Quality Ontario
• Network Steering Committee
• Network Program Delivery Team
• Network Hospital Leads Group
• ERAS leadership

Member Hospitals
• Long-standing NSQIP participants
• Run-in phase participating hospitals
• Independent NSQIP participants and Network members

Hospital Teams
• Surgeon Champions
• Surgical Clinical Reviewers
• Hospital Surgical Quality Improvement teams
• Network Hospital Leads Group

Community of Practice
• An online forum where surgical teams can:
  • Discuss best practices
  • Share local innovations
  • Discover ways of improving surgical care in Ontario
  • Mentors, monthly calls, SC/SCR groups, hospital leads group, webinars etc.

Connections
• Canadian Patient Safety Institute (CPSI)
• Canadian Collaborative
• IDEAS (Improving & Driving Excellence Across Sectors) Programs
• IDEAS Alumni
• Quality Improvement Plans
• Health Link Communities
• Other
IMPROVING SURGICAL CARE: HQO BRINGS NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM TO ONTARIO

The National Surgical Quality Improvement Program (NSQIP) is an internationally recognized initiative to measure and improve the quality of surgical care. Due to the success and impact of NSQIP in other regions of Canada and in the United States, HQO has brought NSQIP to Ontario to provide hospitals with a surgical quality improvement program that has been proven to improve patient care and outcomes, and decrease surgical complications and the cost of health care delivery.
Summary: Where we are at?

1. Surgical quality is measureable

2. Data can be used to improve surgical care and reduce variation → Collaboration accelerates the process!

3. Represents a “Triple Win”
   - Patients → decrease complications
   - Providers → opportunity to improve care
   - Payers → potential to reduce cost

4. Supporting hospitals working together to improve care:

   = NSQIP-ON
Questions?

Please submit your questions using the chat box on the bottom right of your screen.
Upcoming sessions in the Chronic Care series:

- May 8, 2015 – The Chronic Care Model: Designing Care with “Chronic” as the New Norm
- June 3, 2015 – Supporting Carers of Patients Living with Chronic Disease
- June 10, 2015 – Bridging the Gap between Patients and Providers through Telehealth in Rural and Remote Regions
Thank you!