The Surgical Care Improvement Project (SCIP)

Ten Years Later
Growing Surgical Interest in Quality, Safety, and Transparency

Presidential Address

Quality, Safety, and Transparency

Hiram C. Polk, Jr., MD

THE GROSS CONNECTION

The American Surgical Association (ASA) was founded by Samuel David Gross and nurtured by his pupils, David W. Yandell and Samuel W. Gross, his son. Dr. Samuel D. Gross was the second Professor of Surgery at the University of Louisville, serving from 1840 to 1856. Dr. Yandell succeeded him in that chair, no doubt because of his association with Dr. Gross, but also perhaps because his father happened to be the Dean. The rich history of Gross’ life in Louisville and Philadelphia has already been mined thoroughly, but I did think recently how little the duties of the surgical chair have changed over almost 150 years.\textsuperscript{1,2} I briefly consulted my successor on his first day in the Chair of Surgery at the University of Louisville about a complicated issue related to our Institutional Review Board. I reminded him that within my first week on the job, I was somewhat peripherally involved in a discussion that subsequently led to a lawsuit. Both of those issues paled in comparison to the fact that Dr.

PURPOSE

The purpose of this address is:

- To examine our knowledge and public attitudes regarding quality, safety, and minimization of medical error;
- To encourage surgeon-led efforts in these activities as well as sensible cost control;
- To explore the potential benefits of scientifically sound, risk-adjusted transparency as a boon to surgery as a profession; and
- A serious caution regarding the Delilah of duty hours and the problems that they pose for our once and future patients.

Quality, safety, and minimization of error are seemingly the sides of an equilateral triangle. Transparency, as I hope to develop, may provide us with assistance in bringing our specialty to a higher level of leadership. The remote history of efforts with respect to increasing the safety of
Enormous Effort and General good Faith

- Systemic review
- SSI and SCIP Bundle
Elements in SSI Prevention

- Equipment/Drapes/Gowns sterilization
- Handwashing/Patient/Site preparation
- Antibiotic Prophylaxis
- Shaving
- Normothermia
- Normoglycemia
- Hyperoxia
- *Staph aureus* screening
A mixture of large databases and institution reports – different specialties, different patients, different outcomes
Surgical Site Infection Rates: Deep Incision and Organ Space Infections NHSN 2011

<table>
<thead>
<tr>
<th>Procedure</th>
<th># Procedures</th>
<th># Infections</th>
<th>Infection Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABG</td>
<td>87,934</td>
<td>926</td>
<td>1.05</td>
</tr>
<tr>
<td>Small Bowel Surgery</td>
<td>12,262</td>
<td>259</td>
<td>2.11</td>
</tr>
<tr>
<td>Colon Surgery</td>
<td>68,702</td>
<td>1,663</td>
<td>2.42</td>
</tr>
<tr>
<td>Abdominal Hysterectomy</td>
<td>82,082</td>
<td>524</td>
<td>0.64</td>
</tr>
<tr>
<td>Hip Prosthesis</td>
<td>180,996</td>
<td>1,422</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Dose of Antibiotics for Prophylaxis

• Always give at least a full therapeutic dose of antibiotic
• Consider the upper range of doses for large patients and/or long operations
• Repeat doses for long operations
Arm Tissue O2 Saturation and SSI

Perioperative Warming, Intraoperative Temperature and Complications

- Open abdominal operation with bowel resection
- All patients warmed in the O.R.
- Study group (perioperative) warmed 2 hours pre-op and 2 hours post-op

Wong, Br J Surgery 2007; 94: 426-6
Expanded Surgical Time Out: A Key to Real-Time Data Collection and Quality Improvement

Terry Altpeter, RN, PhD, Kitty Luckhardt, LPN, John N Lewis, MD, PhD, Alden H Harken, MD, FACS, Hiram C Polk Jr, MD, FACS

BACKGROUND: Some of the concepts contained here have been discussed and incorporated in another publication, but the data are entirely unique to this manuscript. (See: Transforming the Surgical “Time-Out” Into a Comprehensive “Preparatory Pause.” Backster A, Teo A, Swift M, MD, Polk HC Jr, MD, FACS, Harken AH, MD, FACS. J Cardiac Surg. in press.)

The increasing push for quality improvement coincides with the slowly growing use of surgical time out (STO) to lessen the likelihood of wrong-site operation. We believe that the use of STO as a reflective pause or a preoperative briefing has broader value. The purpose of this article is to describe one institution’s experience with this technique and to validate its potential use by others.
Expense of Implementation

• Much time and money required
• Dedicated hospital taskforces
• In-service education for physicians and staff
• Need administrative leader, system leader, and day-to-day process leaders
• Data collection and analysis – careful/expensive
• Frequent meetings for feedback/monitoring of compliance and performance
Positive Effects of SCIP

• Largest decrease in SSI observed in poorest performing facilities
• Still observed after Risk Adjustment for confounding infection risks
• Compliance with whole SCIP bundle was demonstrated to be more effective
• Possibly reduced hospital and pharmacy expenditures
The “NON-” Effects of SCIP

• No increase in SSI, morbidity, or mortality consistently demonstrated with any aspect of SCIP implementation
• No measurable decrease in SSI was observed in hospitals with >90% compliance at start of study
• SCIP compliance is at best a weak measure of hospital quality and unrelated to reimbursements
PubMed search 02/2013: "Surgical Care Improvement Project" AND "adherence";
All papers since 1998

75 papers

Reviewed titles and abstracts for: Antibiotic, SCIP INF, Surgical site infection

47 papers

Included papers with SSI as an endpoint and meaningful results

15 papers
How difficult is it to learn/know the truth and remain current with data sources and their credibility
The American College of Chest Physicians wishes to acknowledge the cooperation and support of the following sponsors for providing an unrestricted educational grant to support the publication of CHEST:

- AstraZeneca LP
- Aventis Pharmaceuticals
- Bristol-Myers Squibb/Sanofi-Synthelabo Partnership
- GlaxoSmithKline
- Organon Sanofi-Synthelabo LLC
Conflict of Interest

Researchers and physicians who write the rules on prescribing drugs have extensive financial connections with the pharmaceutical industry, an investigation by *Nature* has revealed. Public-health experts say that the results of the survey, which is the largest of its kind, suggest that drug companies are distorting decisions about how their products are being prescribed.

In the investigation of the panels that write clinical guidelines — documents that govern the diagnosis and treatment of patients — *Nature* found that more than one-third of authors declared financial links to relevant drug companies, with around 70% of panels being affected. In one case, every member of the panel had been paid by the company responsible for the drug that was ultimately recommended.

These links with pharmaceutical companies are more worrying than the financial conflicts...

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35% of Authors sais they had a conflict of interest of some kind

16% Authors helped to write guidelines on illnesses relevant to companies in which they owned stock

49% of guidelines did not include any details of authors conflicts’ of interest

...bodies that produce guidelines maintain that there aren’t enough experts without conflicts of interest

In one example uncovered by *Nature*, guidelines for the treatment of anaemia in HIV-positive patients were written by a working group selected by Paul Volberding, a leading AIDS researcher and physician, and vice-chairman of the Department of Medicine at the University of California, San Francisco. Volberding convened the group at the request of Ortho Biotech, a pharmaceutical company based in Bridgewater, New Jersey. Ortho Biotech funded the group’s meetings, and all six members, including Volberding, had been paid by the company for lecturing or consultancy jobs. The group’s latest guidelines, published last year (P. Volberding et al. *Clin. Infect. Dis.* 38, 1454–1463; 2004), recommend the use of epoetin alpha, a drug marketed by Ortho Biotech.

**Slippery stats**

Physicians’ organizations say that one or two authors with a conflict of interest could not influence a panel containing tens of new...
1856 Virchow’s Triad

1865 Trousseau associates GI carcinoma with migratory VTE

1876 Kakkar VV uses Doppler USS and shows higher actual rate of DVT. Use of MiniHep to prevent DVT

1888 Claggett and Pezzouli show 30% DVT and 1% fatal PE rate ing general surgery

1976 Geert shows heightened rate of VTE in trauma patients

1988 Claggett and Pezzouli show 30% DVT and 1% fatal PE rate ing general surgery

1994 Geert shows heightened rate of VTE in trauma patients

1995 OCP and estrogen linked to heightened VTE in young females

1999 Long-haul air-travel associated with 3x increased risk for VTE

1997 Kakkar VV uses Doppler USS and shows higher actual rate of DVT. Use of MiniHep to prevent DVT
2003 CMS SCIP Pilot awarded to KY & OH; development of program began

2004 SCIP data collection began in KY

2004 ACCP Chest guidelines

2005 Heit describes VTE incidence at 900,000 with estimates 300,000 deaths

2005/6 SCIP 2004 analysis shows lower than expected VTE rate. AAOS, ACOG, SAGES note results

2007 Surgeons attitude about prophylaxis inconsistent

2008 SCIP, UHC and KYDPH Data show low VTE, PE attack rate

2008/9 Lovenox most successful Sanofi drug; sales at $3.1B per year

2010 UHC low VTE rate patients with prophylaxis lower without prophylaxis
Cardiovascular & Coagulation Disorders
Prolonged Hospital Stays
Emergency Surgery
Major Elective Out-patient Surgery

Chronic Illness
Major Elective In-patient Surgery

RISK OF VTE

HIGH RISK
LOW RISK
<table>
<thead>
<tr>
<th></th>
<th>SCIP 2004</th>
<th></th>
<th>UHC 2004</th>
<th></th>
<th>KYDPH 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>DVT (%)</td>
<td>PE (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>All SCIP Surgery</strong></td>
<td>5,285</td>
<td>20 (0.4)</td>
<td>15 (0.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>966,474</td>
<td>11,456 (1.2)</td>
<td>5,298 (0.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20,563</td>
<td>-</td>
<td>56 (0.3)</td>
<td></td>
<td></td>
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</tbody>
</table>
A randomized-control trial of 1548 critically-ill patients were assigned to conventional vs. intensive insulin therapy in an attempt to tightly lower glucose and prevent infection.
However, a recent meta-analysis in *JAMA* of all trials to date failed to demonstrate any benefit on survival, hospital length of stay, or septic sequelae.

*Wiener RS, et al. 2008*

**Benefits and Risks of Tight Glucose Control in Critically Ill Adults**

A Meta-analysis

<table>
<thead>
<tr>
<th>Renda Soylemez Wiener, MD, MPH</th>
<th><strong>Context</strong> The American Diabetes Association and Surviving Sepsis Campaign recommend tight glucose control in critically ill patients based largely on 1 trial that shows decreased mortality in a surgical intensive care unit. Because similar studies report conflicting results and tight glucose control can cause dangerous hypoglycemia, the data...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daniel C. Wiener, MD</td>
<td></td>
</tr>
<tr>
<td>Robin J. Larson, MD, MPH</td>
<td></td>
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</table>
Same Journal...
8 years Later...
Opposite outcome

26;360(13):1283-1297

No. at Risk
Conventional control 3014 2379 2304 2261
Intensive control 3016 2337 2227 2182
Definition of Ideal Surgical Technique

- The way I would do it
- The way my chief made me do it
- Minimal tissue trauma
- Minimal blood loss
- Minimal foreign bodies
- Short operating time (without sacrificing the above)
Surgical Care Improvement Project (SCIP)

The Goal of this initiative is to prevent surgical site infections by implementing our four components of care

1. Appropriate use of prophylactic antibiotics
2. Appropriate hair removal
3. Controlled 0600 postoperative serum glucose in cardiac surgery patients
4. Immediate postoperative normothermia for colorectal patients
Antibiotics

- Antibiotic administration is prescribed preoperatively at 30 to 60 or 120 minutes prior to the incision, depending on the type of antibiotic

- The antibiotics should be continued for at most 24 hours postprocedure

- Dosage should be adjusted for patient weight to prevent larger individuals from being underdosed

- Patients must be redosed during long procedures to maintain appropriate serum antibiotic levels

Bratzler Houck, Am J Surg 2005
QualityNet Website. www.qualitynet.org
Surgical Site Infection Prevention: Time to Move Beyond the Surgical Care Improvement Program
Hawn, Mary; Vick, Catherine; Richman, Joshua; et al:
Preventing SSI

- Have good teamwork at all times
- Prewarm the patient
- Enough of the right antibiotic at the right time and repeat if necessary
- Don’t shave
- Thorough skin prep
- Warm the patient in the O.R.
- High FiO$_2$
- Control glucose
- Good teamwork
1. Hendren 4,331 (CRS)
2. Wang 17,714 (THR)
3. Hawn 60,853 (Multi VAMC)
4. Stulberg 405,720 (Multi Premier)
5. Smith 306 (Trauma)

Total 488,924
<table>
<thead>
<tr>
<th>Authors</th>
<th>N=</th>
<th>Operations</th>
<th>Focus</th>
<th>Outcomes</th>
<th>Changes in Compliance</th>
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</thead>
<tbody>
<tr>
<td>Garcia</td>
<td>703</td>
<td>Multi sp.</td>
<td>SCIP 1</td>
<td>+SSI +Sepsis +mt</td>
<td>0.25 0.22 0.001 both &gt;94%</td>
</tr>
<tr>
<td>Wick</td>
<td>602</td>
<td>Multi sp.</td>
<td>SCIP+</td>
<td>+SSI &lt;0.05</td>
<td>both &gt;90%</td>
</tr>
<tr>
<td>Larochelle</td>
<td>706</td>
<td>GI</td>
<td>SCIP 1-3, 7</td>
<td>0 all</td>
<td>both &gt;90%</td>
</tr>
<tr>
<td>Berenguer</td>
<td>113</td>
<td>CRS</td>
<td>SCIP all</td>
<td>+SSI</td>
<td>0.36 38-92%</td>
</tr>
<tr>
<td>Pastor</td>
<td>491</td>
<td>CRS</td>
<td>SCIP all</td>
<td>0 all</td>
<td>40-68%</td>
</tr>
<tr>
<td>Sim</td>
<td>133</td>
<td>CABG</td>
<td>SCIP 1-3</td>
<td>0 SSI</td>
<td>1 3 67-97% 3-67%</td>
</tr>
</tbody>
</table>
SCIP

**Success**
- Perform poorly
- Risk adjustment
- National Groups
- Bundle costs
- Current literature

**Non-effective**
- High performers
- Threats
- Surgical champion
- Revenues
- Changing keystones
What Now My Love?

Quality Care Essential
Inexpensive Monitoring
Pilot studies (Campbell, Mich. BC BS)
Periodic Reassessment of Results
Threat vs $--$
None to doctors
Affordable Care Act

1. Expansion of Benefits
2. Control of Costs
   Industry, hospitals, doctors
3. Quality suffers
Patient Always Comes First

- Public need is our first determinant
- Surgical Time-Out and Post-op “Huddles”
- Real SCIP
  - Glucose, VTE, antibiotic choice and first dose
  - Forget: clip, baths and nasal swabs
Your Work is Vital

Teamwork and Professional Cohesion Are Essential

Reward the guilty and punish the innocent