IS YOUR ICU AND SURGICAL SETTING “BIRD-STRIKE PROOF”?

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Common Language
Common Language

• If radiologists know what they are looking for they have a better chance of finding it

• Important to fill out the request from the OR for a specific film with all the information

A peanut in the chest?

A peanut in the chest??
Communication

• It’s **what** is right not who is right
  ➤ Between nurses and surgeons
    • “We’re missing a sponge” “Let’s re-explore the wound!”
    • “Dr. Is this a good time for lunch relief?”
  ➤ Between nurses and scrub techs
    • “Separate each raytex so we can make sure we have 10”
    • “Let’s verify the sponge holders before you take permanent relief”
  ➤ Between surgeons
    • “Make sure you check behind the heart for any raytex before you close”
    • “Let’s do our wound exam and look for sponges”
OR Practices

- What we do and how we manage our work
  We = Multiple Stakeholders
- Anesthesiologists: 4X4 management, coordinated reversal from anesthesia
- Surgeons: use only radiopaque items, perform a wound exploration
- Nurses: surgical item accounting process
- Scrub Techs: organize field, know equipment
- Radiologists/Technicians: film quality, timely review, appropriate images
Perception vs Reality

OR MANAGER – How I think things work (or should work)

OR STAFF – How things really work: unintended variation
Practice of Counting

• Currently, most of the responsibility for preventing retained sponges resides with the nurse’s ability “to count”.

• Surgeons place undue reliance on the task

• Nurses place unjustified trust in the practice
  ➤ Current counting practices ~10-15% error rate

• Counting in the unit of issue
  ➤ 1,2,3,4,5.....1,2,3
  ➤ Bagging sponges in bundles
  ➤ Keeping counts on pieces of paper

• Adding up sponges in multiple places
Findings

• 80% of retained sponge cases occur in the setting of a CORRECT COUNT
  ➤ Problems with OR practices

• 20% occur in the setting of an INCORRECT COUNT
  ➤ Problems with knowledge and communication


Practice Issues

- Variable counting practices exist throughout an OR - no standardization, little transparency....”my practice”
- Frequent confirmation bias between scrub and circulator
- Loss of situational awareness and missing events that occur outside the scrub or circulator’s locus of control
- Normalization of deviance
- Retained sponge cases have occurred when low numbers of sponges (<20 sponges) have been used
What’s the Count?
The Count was Correct!
The Gorilla in the OR

- The resident who came in the room and took a raytex off the back table and wiped his glasses and threw the sponge away.
- The surgeon who took a towel from the stack of blue drape towels and used it to retract the bladder.
- The scrub tech who put the sponge in the stainless steel canister and went on break.
- The circulator who used a pack of 5 laps as a knee bump for the patient.
Findings

• Problems with the practice of counting relate to nurse and scrub tech
  ➤ over-estimation of their ability
    • “I know how to count 10 raytex”
  ➤ under-estimation of the degree of risk
    • “I’ve never had a retained sponge”

• Lack of understanding about human fallibility
  ➤ Fail to adhere to safety rules
  ➤ Trust without verification
It’s not only about Counting!
Our learning?

- Sponge ACCOUNTing is hard to implement because people don’t want to change their practices even though they say they do.

- Multiple stakeholders MUST change their way of thinking about the problem of RSI and let-go of their perceptions to face reality.
Culture

- Constellation of shared beliefs and ways of interaction, common rules
- OR safety and a safety culture is built on RELATIONSHIPS
  - Mutually respectful
  - Collaboration with shared knowledge
  - Trust with Verification
  - Credibility earned from Expertise
Balancing “No Blame” with Accountability in Patient Safety

Robert M. Wachter, M.D., and Peter J. Pronovost, M.D., Ph.D.

This year marks the 10th anniversary of the Institute of Medicine’s report To Err Is Human, which launched the modern patient-safety movement. Although the movement has spawned myriad initiatives, its main theme, drawn from studies of other high-risk industries, is an “error culture” that has impeded safety. The movement has emphasized the importance of identifying and fixing error-prone situations and settings and implementing systems that prevent caregivers from committing errors, catch errors before they cause harm, or mitigate harm from errors that do reach patients.

Many health care organizations (including our own) have recognized that a unidimensional focus on creating a blame-free culture carries its own risks. But despite this recognition, the appropriate balance has been elusive, and few organizations have implemented meaningful systems of accountability, particularly for physicians. In this article, we describe some of the barriers to physician accountability, enumerate patient-safety practices that are ready for an accountability approach, and suggest penalties for the failure to adhere to such practices. We focus on situations in which the action (or inaction) of individual physicians poses a clear risk to patients, rather than on the broader issues of clinical competence or disruptive behavior; readers who are interested in the latter issues are referred to other sources.
Multi-stakeholder

• Need engagement and participation from multiple people usually from multiple disciplines
  ➤ SCIP measures
    • examples
  ➤ ICU improvement in delirium
    • examples
TEAMWORK

“It is the ability to work together which determines success.”
Who is on the team?
Who is NOT?
WHERE WE ARE NOW AND WHERE WE ARE GOING

Cumulative Percent Curve

Percent of Total Population

95%  80%  50%  15%  0%

Innovator Early Adopter Early Majority Late Majority Laggard

Figure 2. Cumulative Percent Distribution of Diffusion Theory Adopter Groups Showing Remaining Opportunity
Complex Adaptive System

1. Heterogenous interdependent decision making agents
2. Frequent interaction with each other creates learning
3. Development of emergence - the whole is greater than the individual parts
Learning System

• Goal is to create continuously learning organizations that generate and transfer knowledge from every patient interaction to yield greater performance predictability and reliability

• Leadership has to support vision of continuous improvement

Best Care and Lower Cost: The Path to Continuously Learning Health Care in America, IOM August 2012
Complex System

• Explosion of biomedical and clinical knowledge
• Escalating cost of care
• Expanding array of care providers
• Organizational and technological options increase
• Patient engagement
Include all of this?

Complex Change

- bowel prep
- oral antibiotics
- preop diet
- bathing
- Scheduling process
- In/out of room traffic
- Intraoperative room temperature
- criteria for leaving wound open
- Hair clipping
- Incision with scalpel/cautery
- Duration of operation
- Method of dividing the mesentary
- Reperitonealization
- wound protector
- change gloves
- assessment of quality of blood supply
- perioperative fluid management

- Epidural/spinal
- preoperative temperature warming
- standardized protocols
- variable dosing based on weight
- Skin prep product
- Skin prep duration
- Suture type/performer
- Handsewn vs. stapled
- testing Anastomosis
- Interrupted vs. continuous suture
- Skin staples/subcuticular/subcutaneous suture
- Tissue handling
- Incision with scalpeleruery
- Duration of operation
- Method of dividing the mesentary
- Reperitonealization
- wound protector
- change gloves
- assessment of quality of blood supply
- perioperative fluid management

- Dressing type
- Dressing duration
- topical ointment to incision
- Discipline: colorectal, general, gyn
- Years in practice
- Individual that does closure
- wearing of scrubs outside OR

- protocol for redosing
- Case duration
- Wound protector
- Use of intra-abdominal drain
- Use of subcutaneous drain
- Use of iban
- IV fluid administration
- Wound irrigation
- Fixed vs. nonfixed retraction

- Risk assessment
Have an Action Plan
Think of the project as an experiment
Neuro Infections

**NEUROSURGERY RULES**

TO REDUCE THE RISK OF WOUND INFECTION

**ANESTHESIA:**
- Temperature always ≥ 36
- Glucose < 150
- FIO2 ≥ 80%
- Antibiotics within 30 min of incision:
  - Cefazolin 1 or 2 gm → Re-dose q 4 hrs
  - If allergic: Vancomycin 15mg/kg → re-dose q 8hrs at 10mg/kg
  - If transphenoidal or transoral: Chloramphenicol 500mg → re-dose q6 hrs (confirm with Neurosurgeon)

**SCRUB/CIRCULATING NURSES:**
- Hair removal: minimal clipping
- Skin scrub: Chlorhexidine, then Chloroprep
- For DBS and VNS: do not open implants until requested by surgeon; only surgeon handles
- No street clothes under paper scrubs for visitors

**SURGEONS:**
- Use Kefzol irrigation (or vancomycin if giving vancomycin IV)
- Cover wound with blue towel when fluoro passes over field (except when not practical, such as XLI)
- Avoid drains for simple lumbar cases
- Minimize bone wax
- If CSF leak: close fascia with interrupted sutures PLUS a running Prolene
- Dropped bone flap: soak in 50/50 betadine/antibiotic irrigation and replace
- Clean scrubs to start each day
- Change masks between cases
Neurosurgery Infections
January 2009 to September 2010
(updated 10/15/10)

2/17/09: Neurosurgery implemented a standardization of pre-op, peri-op and post-op procedures

10/15/09: CHG Wipes trial started
VTE Prevention

• Separate protocols for General Surgery, Neurosurgery, Orthopedic Surgery, Urology
• Any VTE event: within weeks analysis
• Coordination with ATS service in clinical management and decision making
• Review, review, review
# VTE Prevention

## General Surgery Post-Op VTE Prophylaxis

Sequential compression devices (SCDs) (foot pumps) to be used in all patients unless specific lower extremity contraindications.

### Heparin Dosing for VTE

<table>
<thead>
<tr>
<th>Patient Size</th>
<th>Dosing</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGULAR-size patient (BMI &lt; 40)</td>
<td>Heparin 5000 units q 8 hrs</td>
</tr>
<tr>
<td>BIG patient (BMI ≥ 40)</td>
<td>Heparin 7500 units q 8 hours</td>
</tr>
<tr>
<td>SMALL patient wt ≤ 50 kg (110 lbs)</td>
<td>Heparin 5000 units q 12 hours</td>
</tr>
</tbody>
</table>

### Chronic Kidney Disease (CrCl < 15ml/min)

Heparin 5000 units q 8 hrs

### Epidural Catheter or Spinal Anesthesia:

- **Prophylactic Anticoagulant**
  - Antiocoagulant OK while catheter in place?
  - Time after catheter placement until next dose
  - Time after prophylaxis until next dose
  - Time after catheter removal until next dose
  - Time after last dose until catheter removal

<table>
<thead>
<tr>
<th>Anticoagulant</th>
<th>OK while catheter in place</th>
<th>Time after placement until next dose</th>
<th>Time after prophylaxis until next dose</th>
<th>Time after catheter removal until next dose</th>
<th>Time after last dose until catheter removal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heparin 12h SQ</td>
<td>Yes</td>
<td>1 hour</td>
<td>1 hour</td>
<td>1 hour</td>
<td>&gt;5-8 hours</td>
</tr>
<tr>
<td>Arixtra 10k unslowed or bos</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heparin 12h SQ OP &lt;10k units (24h)</td>
<td>Yes with caution</td>
<td>1 hour</td>
<td>1 hour</td>
<td>1 hour</td>
<td>&gt;6-8 hours</td>
</tr>
<tr>
<td>Enoxaparin 80 SQ</td>
<td>No</td>
<td>Remove prior to dosing</td>
<td>24 hours</td>
<td>&gt;2 hours</td>
<td>BID 10-12</td>
</tr>
<tr>
<td>Dalteparin 50 SQ</td>
<td>Yes with caution</td>
<td>5-6 hours if traumatic 24h</td>
<td>5-6 hours if traumatic 24h</td>
<td>&gt;2 hours</td>
<td>QD 10-12</td>
</tr>
</tbody>
</table>

### Dalteparin for Cancer-Related Surgery

- Post-op VTE risk higher
- VTE risk highest first 30 days post-op
- Risk reduction potential with one month post-op VTE prophylaxis

**Specific cancer-related guidelines:**
- **Regular Size:** Dalteparin 5000 units q daily
- **Big Size:** 7500 units q daily
- **Small Size or CrCl < 15ml/min:** 2500 units q daily

**Discharge:** Provide Rx to complete 30 days of post-op anticoagulation

**Monitoring:** Arrange post-discharge follow-up appointment via CPRS consult to Anticoagulation & Thrombosis Service (ATS)

For any questions, call ATS (409-5 or 739-9053)
VTE Prevention

NEUROSURGERY VTE PROPHYLAXIS

VTE Prophylaxis Guidelines

High Risk Patients:
- Elderly (≥75) having any procedure
- Motor weakness or any condition preventing OOB on POD1
- Active cancer
- History of VTE
- Crani for tumor or combined anterior-posterior spine procedure

Heparin 5000 units q 12 hours
(to start 24-36 hrs postop)
and SCDs

Low Risk Patients & Non-Tumor Crani:
- Sequential compression devices/SCDs
  (foot pumps) are to be used in all patients unless specific lower extremity contraindications.
Review, review, review
Process Improvement

• Any process is composed of a number of steps

• Only two ways to improve a process
  ➔ Reduce the number of steps involved
  ➔ Improve the reliability of individual steps
Reliability

“high reliability” refers to a low rate of product defects or service delivery.

Healthcare reliability

consistent use of appropriate treatments and processes of care that have been shown to produce more favorable outcomes.
Sponge Counts

1. Count before start of case
2. Count at cavity closure
3. Count when new sponges added
4. Count at fascial closure
5. Count at skin closure
6. Count when all sponges off field = FINAL COUNT
1. Reduce # of steps

1. Count at start of case 95%
2. Count at cavity closure 99%
3. Count when add sponges 98%
4. Count at fascial closure 99%
5. Count at skin closure 90%
6. Count when all sponges off field (FINAL COUNT) 95%

OVERALL reliability?
1. Reduce # of steps

1. Count at start of case  95%
2. Count at cavity closure  99%
3. Count when add sponges 98%
4. Count at fascial closure  99%
5. Count at skin closure  90%
6. Count when all sponges off field (FINAL COUNT)  95%

OVERALL reliability = 78%
1. Reduce # of steps

1. Count b4 start of case  95%
2. Count at cavity closure  99%
3. Count when add sponges 98%
4. Count at fascial closure  99%
5. Count at skin closure  90%
6. Count when all sponges off field = FINAL COUNT 95%

OVERALL 78%

X

1. Count b4 start of case  95%
2. Count at cavity closure  99%
3. Count when add sponges 98%
4. Count at fascial closure 99%
5. Count at skin closure  90%
6. Count when all sponges off field = FINAL COUNT 95%

OVERALL 87%
1. Reduce # of steps

1. Count b4 start of case 95%
2. Count at cavity closure 99%
3. Count when add sponges 98%
4. Count at fascial closure 99%
5. Count at skin closure 90%
6. Count when all sponges off field = FINAL COUNT 95%

OVERALL 78%

1. Count b4 start of case 95%
2. Count at cavity closure 99%
3. Count when add sponges 98%
4. Count at fascial closure 99%

X

6. Count when all sponges off field = FINAL COUNT 95%

OVERALL 87%

9%
Standardization

- Develop and implement a standardized process for the tracking of surgical sponges
- Every case, every OR, every time
- Make it simple and easy to use
- REDUCE VARIATION....... DECREASE COMPLEXITY

STOP JUGGLING!
## 2. Improve Reliability

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Count b4 start of case</td>
<td>95%</td>
</tr>
<tr>
<td><strong>2.</strong> Count at cavity closure</td>
<td>99%</td>
</tr>
<tr>
<td><strong>3.</strong> Count when add sponges</td>
<td>98%</td>
</tr>
<tr>
<td><strong>4.</strong> Count at fascial closure</td>
<td>99%</td>
</tr>
<tr>
<td><strong>5.</strong> Count at skin closure</td>
<td>90%</td>
</tr>
<tr>
<td><strong>6.</strong> Count when all sponges off field = FINAL COUNT</td>
<td>95%</td>
</tr>
</tbody>
</table>

At the IN count the critical step is to SEPARATE the sponges when doing the 3S’s.

At the final count all sponges (used and unused) MUST be in the holders.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5.</strong> Count at skin closure</td>
<td>90%</td>
</tr>
<tr>
<td><strong>6.</strong> Count when all sponges off field = FINAL COUNT</td>
<td></td>
</tr>
</tbody>
</table>
2. Improve Reliability

1. Count b4 start of case 95%
2. Count at cavity closure 99%
3. Count when add sponges 98%
4. Count at fascial closure 99%
5. Count at skin closure 90%
6. Count when all sponges off field = FINAL COUNT 95%

OVERALL 78% 5%

1. Count b4 start of case 98%
2. Count at cavity closure 99%
3. Count when add sponges 98%
4. Count at fascial closure 99%
5. Count at skin closure 90%
6. Count when all sponges off field = FINAL COUNT 98%

OVERALL 83%
Simplify and **Reliability**

1. Count b4 start of case 95%
2. Count at cavity closure 99%
3. Count when add sponges 98%
4. Count at fascial closure 99%
5. Count at skin closure 90%
6. Count when all sponges off field = FINAL COUNT 95%

**OVERALL 78%**

1. Count b4 start of case 98%
2. Count at cavity closure 99%
3. Count when add sponges 98%
4. Count at fascial closure 99%
5. Count when all sponges off field = FINAL COUNT 98%

**OVERALL 92%**

14%
What 14% means?

- 14% improvement means instead of 22 miscounts in every 100 cases there are only 8 miscounts per 100 cases.
- In one year if you do 10,000 cases per year instead of having 2,200 miscounts you have 800.
- Instead of 42 events/week you have 15/week; from 8/day to 3/day.
- How many ORs do you have? How many miscounts do you have?
Change Practice

• Rewriting the policy or adding a step to an existing policy is unlikely to prevent recurrence and actually decreases reliability

• Problem is with error prone, non-verifiable practices

• Have to engage multiple stakeholders; each a content expert in their domain
# Surgical Checklist

## Surgical Safety Checklist (First Edition)

### Before induction of anaesthesia

<table>
<thead>
<tr>
<th>SIGN IN</th>
<th>TIME OUT</th>
<th>SIGN OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PATIENT HAS CONFIRMED</strong></td>
<td>CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE</td>
<td>NURSE VERBALLY CONFIRMS WITH THE TEAM:</td>
</tr>
<tr>
<td>• IDENTITY</td>
<td></td>
<td>• THE NAME OF THE PROCEDURE RECORDED</td>
</tr>
<tr>
<td>• SITE</td>
<td></td>
<td>• THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)</td>
</tr>
<tr>
<td>• PROCEDURE</td>
<td></td>
<td>• HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)</td>
</tr>
<tr>
<td>• CONSENT</td>
<td></td>
<td>• WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED</td>
</tr>
<tr>
<td><strong>SITE MARKED/NOT APPLICABLE</strong></td>
<td></td>
<td><strong>SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM</strong></td>
</tr>
<tr>
<td><strong>ANAESTHESIA SAFETY CHECK COMPLETED</strong></td>
<td><strong>SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?</strong></td>
<td><strong>SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT</strong></td>
</tr>
<tr>
<td><strong>PULSE OXIMETER ON PATIENT AND FUNCTIONING</strong></td>
<td><strong>ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>DOES PATIENT HAVE A:</strong></td>
<td><strong>NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>KNOWN ALLERGY?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DIFFICULT AIRWAY/ASPIRATION RISK?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES, AND EQUIPMENT/ASSISTANCE AVAILABLE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RISK OF &gt;500ML BLOOD LOSS (7ML/KG IN CHILDREN)?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Before skin incision

### Before patient leaves operating room

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*This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.*
Surgical Safety Check

To: Surgeons, Anesthesiologists & CRNAs, OR Nurses & Scrub Techs

NEW "TIME OUT" IN THE SFVA SURGICAL PATIENT SAFETY ✓ LIST

GO LIVE: Friday, October 1, 2010
ALL TEAM MEMBERS AND ALL SECTIONS

REQUIRED ACTIONS:

OR BRIEFING
Who: Any surgeon, circulating RN, anesthesia staff
When: Prior to or after induction

New "TIME OUT"
Who: Must be called by the Attending surgeon who must be present in the OR. The “Time Out” cannot be done by a resident. The Attending does not have to be scrubbed but must be in the room.
When: “Time Out” must be performed just before the incision is made. The scalpel will not be provided until the “Time Out” is completed.

OR DEBRIEFING
Who: Any surgeon, circulating RN, anesthesia staff
When: At the completion of the case

SEE THE NEW SFVA SURGICAL PATIENT SAFETY CHECKLIST (aka MITT tool)
Have an Action Plan
Not only what you’re going to do but also.... How you are going to do it.
Change Strategy

- A tool to help in the development of a case for change
- DVF > (greater than)R
- Data + Vision + First Steps > Resistance
Data

- 80% of retained sponge cases have occurred in the setting of a correct count
- We have had 5 cases of retained surgical sponges in the last 2 years
- The total outlay of liability coverage has been in excess of 2 million dollars
Vision

• Retained sponges have to be removed with another operation and that causes patient harm. As healthcare providers we try to heal not harm

• We want our OR to be considered the safest, the best place to have an operation
First Steps

• Find a surgeon champion, a nurse champion and a radiology champion to engage in the process change

• Discuss with leadership their unequivocal support to push forward when the pushback starts

• Define needed resources and make sure they are available
Resistance

• I haven’t ever had a retained sponge so why do I have to change my practice?
• Why are you wasting your time?
• I’m only a radiology technologist so that isn’t a member of the team
• If I do that I will increase my liability
Pogo gets it

- The biggest resistance to change will come from within
- Everyone will tell you however it comes from without

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WE HAVE MET THE ENEMY AND HE IS US.
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© 1971 WALT KELLY
Think of the patient

- Rather than thinking of yourself and your needs
  - WIIFM
  - “If I do that it will increase my liability”
  - “But this is my practice and it works for me”
  - “I only read what I see”
- Think of the patient’s needs FIRST