Improving the Quality of your Practice

CRASH 2016

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Disclosures

Travel & Expense support from the ASA, AQI, Omnicell
Indirect research support from Codonics and Omnicell
Presentation contains unpublished data from the AQI registries and data, slides used with permission

Objectives

1. Getting the data to understand your practice
2. Leveraging analytics to produce results
3. Emerging trends in clinical pathways
4. Moving towards highly reliable operations

Triple Aim and Quality Improvement

Healthcare Spending

Optimism

The case for optimism: “American efficiency and productivity drove and will continue to drive that growth”
US Anesthesia Partners

Dr. Rick Dutton
Former Executive Director
Anesthesia Quality Institute
Chief Quality Officer
US Anesthesia Partners

“My goal is to say USAP is the best anesthesia practice in the business and be able to prove it.”

Value Proposition

\[ V = 0 + S \]

Value in healthcare is measured in terms of patient outcomes achieved per dollar expended

Reward for:
- Best overall care
- Lowest cost
- Minimize complications

What is Value in Healthcare?
Michael E. Porter PhD
NEJM 2010; 363: 2477-2481

To Error is Human

What’s wrong with this picture?

Humans make hundreds of mistakes every day

How Safe is Healthcare?

<table>
<thead>
<tr>
<th>Risk of Harm</th>
<th>How Many People Die?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checking a bag</td>
<td>Driving In US</td>
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<tr>
<td>Handing over a child</td>
<td>Mountaineering</td>
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<td>Bungee Jumping</td>
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<td>Nuclear Power</td>
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<td>Chemical Manufacturing</td>
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<td>Scheduled Commercial Airlines</td>
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<td>欧洲铁路</td>
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<td></td>
<td>欧洲航空</td>
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<td></td>
<td>毒物制造</td>
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<td></td>
<td>危险 (&gt;1/1000)</td>
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<tr>
<td></td>
<td>超安全 (&lt;1/100,000)</td>
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</tbody>
</table>

Patient Harm in the OR
Eight Million Cases – AJQ Registries PACU and Operating Room

Minor: 0.52%
Major: 10.21%
Mortality: 0.03%

The Risk is the Same
**Risk of Anesthesia - Perioperative**

- **Perioperative Mortality**: 1.85% all cause (0.07% hernia - 5.97% major vascular)

**Preoperative** → **Surgery** → **Inpatient** → **Recovery**

**Perioperative Harm**

Netherlands, 3 million cases, Noordzij PG, Anesthesiology 2010

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**Basic Tenets of Human Error**

- Everyone commits errors
- Human error is generally the result of circumstances beyond the control of those committing the errors
- Humans make more errors during routine activities, less when focused and thinking critically

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**Types of Errors**

- **Active Failures**: Acts committed by those in direct contact with the patients: slips, lapses, fumbles, mistakes, procedural violations.
- **Latent Conditions**: The resident pathogens in the system: time pressure, inadequate equipment, fatigue, non-fail-safe procedures, design and construction deficiencies.

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**Culture of Medical Error**

**Past**: Individual is always responsible
- Shame and blame culture
- Hiding mistakes
- Improvement difficult
- Low morale - fear

**Future**: Culture of Safety
- Recognize systems contribute
- Speak openly about mistakes / errors
- Concerns are valued and acted upon
- Participants take ownership

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**The System**

- Humans make mistakes
- The system stops human error from reaching the patient
- Systems or processes that depend on perfect human performance are inherently flawed

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**Fix the System**

- Incredibly complex
- Dependencies on everything and everyone
- Highly variable
- Can’t fix what we don’t know about
A History of Reporting in Anesthesia

University of California, San Francisco & University of Colorado
Focused on near misses
3500 reports from faculty, housestaff and CRNA/AAs
Research why individuals choose not to report and optimized system to address needs of anesthesiologists
With interventions, reporting increased ~20 fold compared to using hospital systems.

United States - Patient Safety Organization
Creates a framework of aggregating information across institutions
Approved in 2009
Allows for a national anesthesia reporting system that is secure

Disincentives for Reporting

Cognitive and behavioral reasons
Poor education about what constitutes an event
Concern over legal or credentialing consequences
Personal shame
Fear of implicating others

Systems reasons
Time consuming
Difficult to access
Lack of anonymity
Sluggish infrastructure
Ambiguous, poorly designed interfaces
Lack of feedback and follow-up, no perceived value

Tenets of a successful system

Secure and non-discoverable
AIRS is part of AQI which is a registered PSO
Quick entry time and ease of use
Balance of data resolution against time
Accessibility
Ideally, from any computer, anywhere in the world
Captures both near misses and incidents of patient harm
Option of anonymity
Searchable
Summary reports to departments, hospitals
Many events are locally influenced

Well Designed Systems Work

UCSF 750 / year reports
Historically, virtually none
CHCO 500 / year reports
Historically, about 10 / year

Benefits of Reporting

Advance the safety of perioperative care
Discover system issues you can fix
Gather quantitative data to influence organizations
Avoid repeating mistakes!

Getting what you need

Anecdotal evidence vs. quantifiable reports
How to start

Paper form – all cases or notable events

Collaborate with hospital / facility
Adapt an existing electronic system

Build your own system
Need IT infrastructure and support

Use the AQI’s system
Local vs. national reporting / reports

AIRS data

Event Classification

- Immunological
- Cardiac/Respiratory
- Maternal
- OB/GYN
- Critical Care
- Neurological
- Vascular
- Other
- Immunological
- Other
- Airway
- Others

2000 Cases
90 institutions
Hundreds of reporters
Some are bulk submitted

AIRS data

Procedural Types

- Orthopedic
- General
- Vascular
- Critical Care
- Neurological
- OB/GYN
- Cardiac/Respiratory
- Other
- Immunological
- Airway
- Others
Trending

Hazards of Electronic medical records and AIMS

Air embolus during ERCP

Drug errors due to shortages

Importance of teamwork

Place for cognitive aids

Trending IT

Charting on the wrong patient

Sudden system failure

Failure to record vital signs

Failure of pharmacy dispensing systems

Incorrect calculations

Flawed / Incorrect decision support

Distraction from all these issues

Trending - Equipment

After induction, no blood pressure reading, weak pulses – checked O2 sat, didn’t work

No ECG cable in room noticed after case

No BP for an hour

No suction, needed suction

Monitor broken

No capnograph in room
Seeing Your Problems

Now, where is the abnormality?

Why standardize in Anesthesiology

Reducing variability highlights deviation
Implement best practice
Change quickly when necessary
Support downstream processes
Foundation of Perioperative Home
Research opportunities

Physician Autonomy

A matter of perspective...

Anesthesia Protocols

• Use Epic Anesthesia to standardize provider performance
  • Pre-op: Review and acknowledge protocol
  • Intra-op: Use scripting (Macros, Reminders) as cognitive aids
  • Post-op (in progress): Make the performance data available
    • Self Serve Analytics

• Change Management
  • Opt-in model vs Department / Service line
  • Assigned person accountable for cases
  • Review data with providers

Barriers and Solutions

Physician Autonomy
  Develop the protocol as a team
  Allow influence over all cases
Recall the protocol
  Integrate into Epic Anesthesia
  Macros specific to case type
Real time guidance
  Use macros, events, and reminders to create decision support
Case Study – Spine Fusions

Complex Procedure
Engaged Perioperative Team (Surgeons, Nursing, Quality)
Multiple Opportunities for decision support

Appointed a service liaison, Dr. Mindy Cohen
Formed an opt-in team
Developed a protocol
Use evidence when available, when not:
Best guess
Consider cost

Protocols

<table>
<thead>
<tr>
<th>Protocols: Reminders</th>
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<tbody>
<tr>
<td><strong>Spine Protocol Results</strong></td>
</tr>
<tr>
<td>Implemented Protocol</td>
</tr>
<tr>
<td>Manual Process</td>
</tr>
<tr>
<td>Developed electronic decision support</td>
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</tbody>
</table>

Median length of stay **3.28**
The median post-operative day of discharge **POD 3**

Success.

Dashboards: The Case for Data

Physicians want to do the right thing
But don’t know where they are relative to others

Need data – usually work alone in a vacuum
Can’t see how others are succeeding or where we are

Peer Pressure - highly motivational
May be the most effective change factor, no one wants to be at the bottom of the scale

Learn from those doing it better
Still have a lot to learn – this is real time improvement

Identify those who need more help
Those at the lower end can be identified and coached
Dashboards: Requirements for Success

- Accurate
  Physicians will search for inaccuracy and perceived excuses

- Real Time
  Need to be able to see the effect of interventions

- Reliable
  Metric cannot change over time, upgrades cannot reset system

- Available
  Must be easy to find and use – self serve analytics

Dashboards: What to consider tracking

- ASA Score Summaries
- Anesthesia Start to Ready Times (by Service)
- Airway placement, Line placement, Block placement
- PACU recovery times, pain scores, opioid administration
- OPPE Metrics
  - Emergence Agitation
  - Nausea / Vomiting
  - Efficiency Metrics
  - Block Utilization
  - Room Utilization
  - Case Volume
  - Cancellations
  - Room Turnover

  Percent of First Case Late Starts

Dashboards: ASA Status

- ASA score summaries
- Distribution of medical complexity
- Start to Ready Times by Service
- Efficiency

Dashboards: OPPE Metrics

- Emergence Agitation
- Nausea / Vomiting
- Efficiency Metrics
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- Room Utilization
- Case Volume
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Dashboards: PACU

- Results in severe patient dissatisfaction
- May be influenced by anesthetic plan

Dashboards: Nausea and Vomiting

- Results in severe patient dissatisfaction
- May be influenced by anesthetic plan
**Dashboards: Emergence Delirium**

Child wakes inconsolable and disassociated from the environment

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**Dashboards: OR Metrics**

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**Dashboards: Change Management**

Scorecard
- Every 6 months
- Self serve analytics available anytime

- Two standard deviations below mean
- Outlier management

- Cases reviewed with clinical management team
  - Suggestions offered for improvement

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**Dashboards: Compliance Reporting**

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**The Intersection of Quality and Informatics is:**

- **High Reliability**

  High Reliability Organizations (HROs) are a subset of organizations which exhibit continuous, nearly error free operation, even in multifaceted, turbulent, and dangerous task environments. HROs include aircraft carriers, nuclear submarines and power plants, air traffic control systems…

  Systems or processes that depend on perfect human performance are inherently flawed.
Improving the Quality of Your Practice

**PROCEDURAL SAFETY CHECKLIST**

**ANESTHESIA SIGN IN**

- Review the patient’s medical history and allergies.
- Confirm the patient’s identity and consent for the procedure.
- Review the patient’s vital signs and laboratory results.
- Verify the procedure and the correct medication dosages.
- Confirm the patient’s readiness for the procedure.

**ANESTHESIOLOGIST**

- Verify the patient’s identity and consent.
- Confirm the patient’s allergies and medical history.
- Review the patient’s vital signs and laboratory results.
- Verify the procedure and the correct medication dosages.
- Confirm the patient’s readiness for the procedure.

**PROTECTIVE EQUIPMENT & ACCESSORIES**

- Check the availability of protective equipment (gloves, masks, gowns).
- Verify the patient’s allergies and medical history.
- Review the patient’s vital signs and laboratory results.
- Confirm the patient’s readiness for the procedure.

**DECONDITIONALIZATION**

- Check the availability of protective equipment (gloves, masks, gowns).
- Verify the patient’s allergies and medical history.
- Review the patient’s vital signs and laboratory results.
- Confirm the patient’s readiness for the procedure.

**PERIOPERATIVE CARE**

- Check the availability of protective equipment (gloves, masks, gowns).
- Verify the patient’s allergies and medical history.
- Review the patient’s vital signs and laboratory results.
- Confirm the patient’s readiness for the procedure.

**DECONDITIONALIZATION**

- Check the availability of protective equipment (gloves, masks, gowns).
- Verify the patient’s allergies and medical history.
- Review the patient’s vital signs and laboratory results.
- Confirm the patient’s readiness for the procedure.

**POSTOPERATIVE CARE**

- Check the availability of protective equipment (gloves, masks, gowns).
- Verify the patient’s allergies and medical history.
- Review the patient’s vital signs and laboratory results.
- Confirm the patient’s readiness for the procedure.

**DECONDITIONALIZATION**

- Check the availability of protective equipment (gloves, masks, gowns).
- Verify the patient’s allergies and medical history.
- Review the patient’s vital signs and laboratory results.
- Confirm the patient’s readiness for the procedure.

**DISPOSING OF WASTES**

- Check the availability of protective equipment (gloves, masks, gowns).
- Verify the patient’s allergies and medical history.
- Review the patient’s vital signs and laboratory results.
- Confirm the patient’s readiness for the procedure.

**AFTER EACH SECTION, STOP AND ASK FOR QUESTIONS FROM THE TEAM. EVERYONE IS RESPONSIBLE FOR STOPPING THE PROCESS WITH CONCERNS.**

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**Preventing Harm: Anesthesia Sign-In**

**Early Warning System: Display**

**Early Warning System: Reports**

**Use of Cognitive Aids in a Simulated Anesthetic Crisis**

**Emergency Protocols**

**Cognitive Aids**