AIRS Integration with Epic Workshop

The merger of quality and informatics

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AQI AIRS Committee Chair

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Disclosures

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Presentation contains unpublished data from the AQI registries and data, slides used with permission

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Objectives

1. Discuss the basis of human error
2. Review the theory and benefits of reporting
3. Describe how to participate in event reporting
4. Review the latest results from the AIRS database
5. Discuss Epic / EMR Integration
6. Brainstorm and plan for the future!

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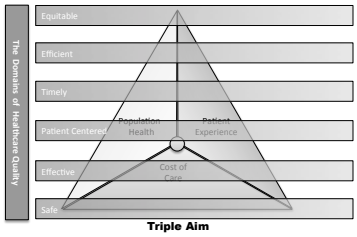
Triple Aim and Quality Improvement



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Value Proposition

$$V_{(VALUE)} = \frac{Q_{(QUALITY)} + S_{(SERVICE)}}{\$_{(COST)}}$$

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

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To Error is Human

What's wrong with this picture?

Humans make hundreds of mistakes every day

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To Error is Human

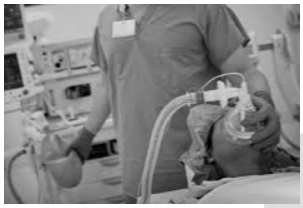
Death every 5.5 minutes

100K a year in US

10X Significant harm

10X Minor harm

10X Near Miss



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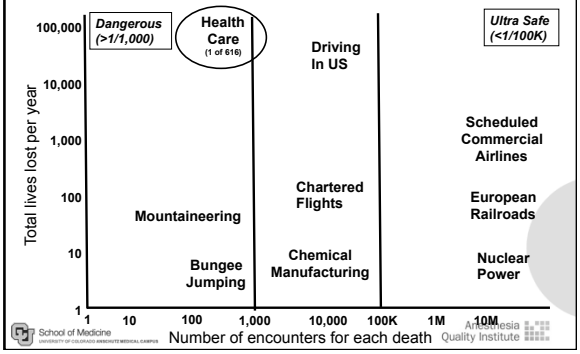
How Safe is Healthcare?



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Risk of Harm

Checking a bag

Handing over a child

THE RISK IS THE SAME

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Risk of Harm

Hospital

Chemical Plant

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Patient Harm in the OR

Four Million Cases – AQI Registries PACU and Operating Room

Minor:
10.21%

Major:
0.52%

MORTALITY
0.03%

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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, Noordzji PG, Anesthesiology 2010

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What is an Error?

Circumstances in which planned actions fail to achieve the desired outcome

- Dr. James Reason

Adverse Event - Patient did not respond optimally to an appropriate treatment

- Side Effects, Patient Differences, Expected complications
- Undesirable & Unintentional

Error - an adverse event that could be prevented given the current state of medical knowledge.

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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

The resident patho ressure, inadequate equipment, fatigue, no ign and construction deficiencies.

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Near Misses

On average, there are 8 errors that occur to result in patient harm

A **Near**-**Miss** is an opportunity to improve safety, health, environmental and security aspects of an operation based on a condition or an incident with potential for more serious consequence

Wharton Risk Center - Wharton School of the University of Pennsylvania

A **Near-Miss** is an unplanned event that did not result in injury, illness, or damage - but had the potential to do so

A **Near-Miss** is a window into the future

Analyzing near misses may represent opportunity

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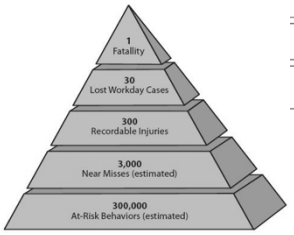
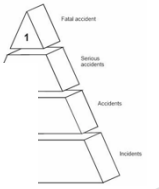
Pyramid of Safety





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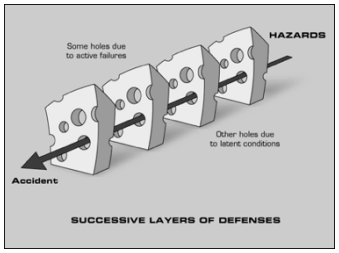
Direct Hits



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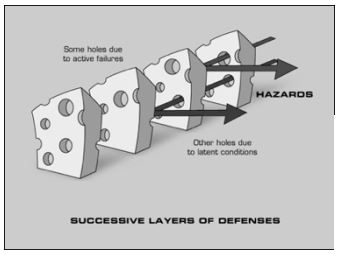
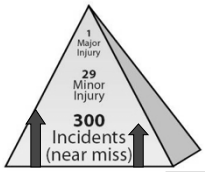
Preventing Errors - Near Miss





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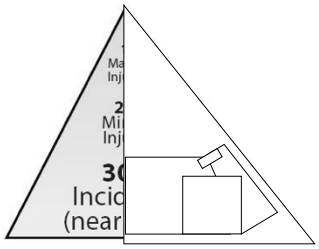
Reducing Injury



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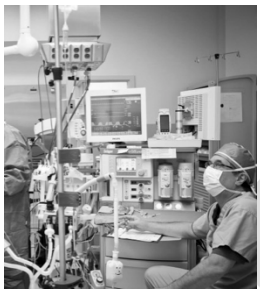
Culture of Medical Error

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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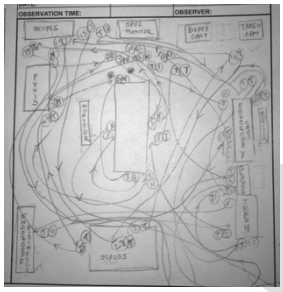
The System

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

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A history of Reporting in Aviation

1974 - TWA Flight 514

- Pilots misunderstood Air Traffic Control instructions and the plane impacted Mt. Weather on final approach
- Investigation yielded near misses from the exact same problem and one airline reported the issue to its pilots
- The Aviation Safety Reporting System was formed to detect and collect near misses. This system is administrated by NASA

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A History of Reporting in Anesthesia

The Australian Incident Monitoring System
- Created 20 years ago, retired in 2005. Was expanded to all events, internationally and lost anesthesia significance. Reporting stopped.

The Australian and New Zealand Tripartite Anaesthetic Data Committee
- Formed in 2006, now has a new electronic reporting system, the AQI system uses much of the same terminology / format

The Critical Incident Reporting System (CIRS)
- Successful system in Switzerland, may be expanded across Europe

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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
- Researched 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

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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
- Potentially discoverable
- Slow infrastructure
- Arduous, poorly designed interfaces
- Lack of feedback and follow-up, no perceived value

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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

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Well Designed Systems Work

Paediatr Anaesth. 2011 Jul;21(7):810-4. doi: 10.1111/j.1460-9592.2011.03574.x. Epub 2011 May 2.

Design and implementation of a near-miss reporting system at a large, academic pediatric anesthesia department.

Guffey P[1], Szolnoki J, Caldwell J, Polaner D.

Author information

[1]Department of Anesthesiology, The Children's Hospital and University of Colorado School of Medicine, Denver, CO, USA. guffey.patrick@tchden.org

Abstract

BACKGROUND: Current incident reporting systems encourage retrospective reporting of morbidity and mortality and have low participation rates. A near miss is an event that did not cause patient harm, but had the potential to. By tracking and analyzing near misses, systems improvements can be targeted appropriately, and future errors may be prevented.

METHODS: An electronic, web based, secure, anonymous reporting system for anesthesiologists was designed and instituted at The Children's Hospital, Denver. This portal was compared to an existing hospital incident reporting system.

RESULTS: A total of 150 incidents were reported in the first 3 months of operation, compared to four entered in the same time period 1 year ago.

CONCLUSION: An anesthesia-specific anonymous near-miss reporting system, which eases and facilitates data entry and can prospectively identify processes and practices that place patients at risk, was implemented at a large, academic, freestanding children's hospital. This resulted in a dramatic increase in reported events and provided data to target and drive quality and process improvement.

UCSF 750 / year reports
Historically, virtually none

CHCO 500 / year reports
Historically, about 10 / year

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Benefits of Reporting

Advance the safety of perioperative care

Discover system issues you can fix

Gather quantitative data to influence organizations

Avoid repeating mistakes!

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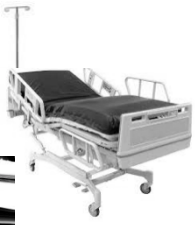
Getting what you need

Anecdotal evidence vs. quantifiable reports



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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

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AQI Registries

NACOR

AIRS

PPAI

Closed Claims

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NATIONAL ANESTHESIA CLINICAL OUTCOMES REGISTRY

Anesthesia Quality Institute
ANESTHESIA INCIDENT REPORTING SYSTEM (AIRS)
Report
Adverse Events
& Near Misses
www.aqiairs.org

PPAI Practice Performance Assessment and Improvement

CLOSED CLAIMS PROJECT and Its Registries
www.asaclosedclaims.org

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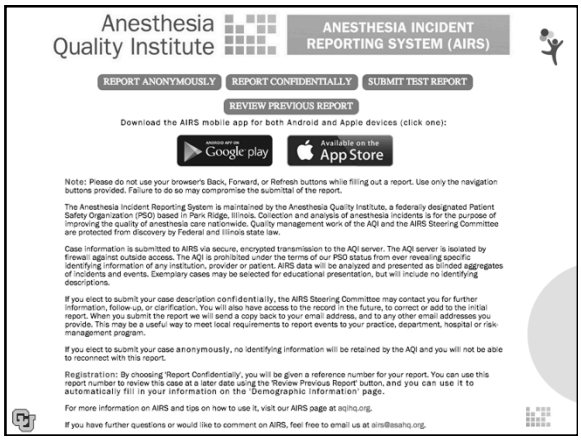
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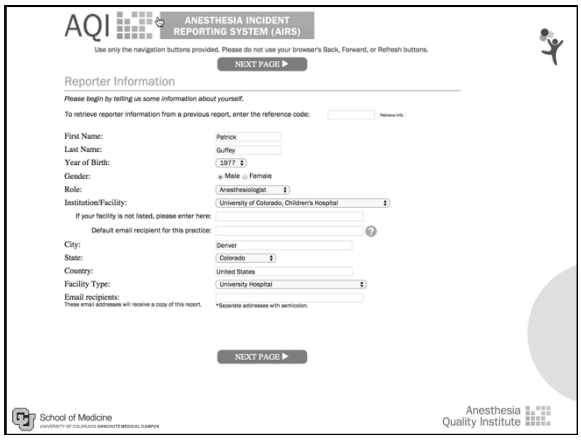
ANESTHESIA INCIDENT REPORTING SYSTEM (AIRS)
REPORT ANONYMOUSLY
REPORT CONFIDENTIALLY
SUBMIT TEST REPORT
REVIEW PREVIOUS REPORT
Download the AIRS mobile app for both Android and Apple devices (click one):
Google play
Available on the App Store
Note: Please do not use your browser's Back, Forward, or Refresh buttons while filling out a report. Use only the navigation buttons provided. Failure to do so may compromise the submittal of the report.
The Anesthesia Incident Reporting System is maintained by the Anesthesia Quality Institute, a federally designated Patient Safety Organization (PSO) based in Park Ridge, Illinois. Collection and analysis of anesthesia incidents is for the purpose of improving the quality of anesthesia care nationwide. Quality management work of the AQI and the AIRS Steering Committee are protected from discovery by Federal and Illinois state law.
Case information is submitted to AIRS via secure, encrypted transmission to the AQI server. The AQI server is isolated by firewall against outside access. The AQI is prohibited under the terms of our PSO status from ever revealing specific identifying information of any institution, provider or patient. AIRS data will be analyzed and presented as blinded aggregates of incidents and events. Exemplary cases may be selected for educational presentation, but will include no identifying descriptions.
If you elect to submit your case description confidentially, the AIRS Steering Committee may contact you for further information, follow-up, or clarification. You will also have access to the record in the future, to correct or add to the initial report. When you submit the report we will send a copy back to your email address, and to any other email addresses you provide. This may be a useful way to meet local requirements to report events to your practice, department, hospital or risk-management program.
If you elect to submit your case anonymously, no identifying information will be retained by the AQI and you will not be able to reconnect with this report.
Registration: By choosing 'Report Confidentially', you will be given a reference number for your report. You can use this report number to review this case at a later date using the 'Review Previous Report' button, and you can use it to automatically fill in your information on the 'Demographic Information' page.
For more information on AIRS and tips on how to use it, visit our AIRS page at aqihq.org.
If you have further questions or would like to comment on AIRS, feel free to email us at airs@asahq.org.


AQI
ANESTHESIA INCIDENT REPORTING SYSTEM (AIRS)
Use only the navigation buttons provided. Please do not use your browser's Back, Forward, or Refresh buttons.
NEXT PAGE ▶
Reporter Information
Please begin by telling us some information about yourself.
To retrieve reporter information from a previous report, enter the reference code:
First Name: Patrick
Last Name: Guffey
Year of Birth: 1977
Gender: Male Female
Role: Anesthesiologist
Institution/Facility: University of Colorado, Children's Hospital
If your facility is not listed, please enter here:
Default email recipient for this practice:
City: Denver
State: Colorado
Country: United States
Facility Type: University Hospital
Email recipients:
These email addresses will receive a copy of this report.
*Separate addresses with semicolon.
NEXT PAGE ▶
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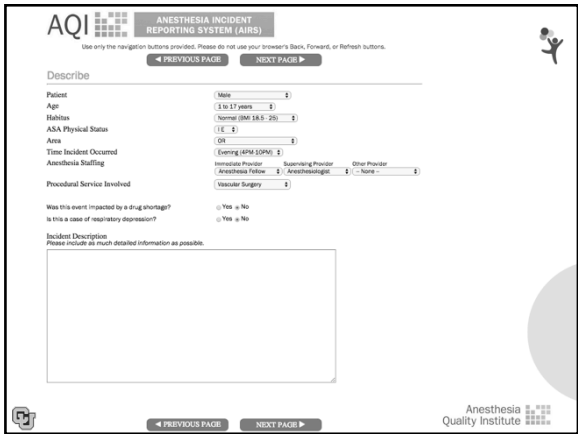
AQI
ANESTHESIA INCIDENT REPORTING SYSTEM (AIRS)
Use only the navigation buttons provided. Please do not use your browser's Back, Forward, or Refresh buttons.
◀ PREVIOUS PAGE
NEXT PAGE ▶
Describe
Patient: Male
Age: 1 to 17 years
Habitus: Normal (BMI 18.5 - 25)
ASA Physical Status: I E
Area: OR
Time Incident Occurred: Evening (4PM-10PM)
Anesthesia Staffing
Immediate Provider: Anesthesia Fellow
Supervising Provider: Anesthesiologist
Other Provider: -- None --
Procedural Service Involved: Vascular Surgery
Was this event impacted by a drug shortage? Yes No
Is this a case of respiratory depression? Yes No
Incident Description
Please include as much detailed information as possible.
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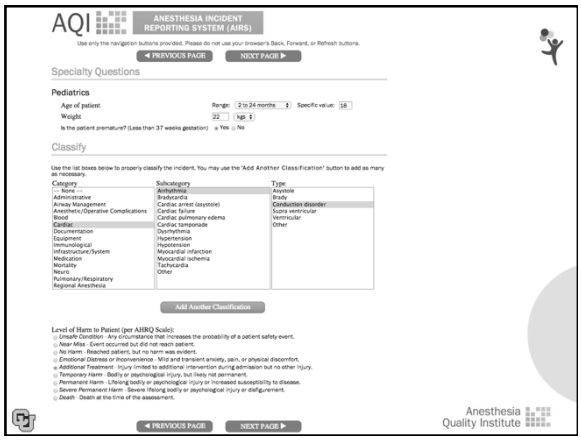
AQI
ANESTHESIA INCIDENT REPORTING SYSTEM (AIRS)
Use only the navigation buttons provided. Please do not use your browser's Back, Forward, or Refresh buttons.
◀ PREVIOUS PAGE
NEXT PAGE ▶
Specialty Questions
Pediatrics
Age of patient
Range: 2 to 24 months
Specific value: 18
Weight
22
kgs
Is the patient premature? (Less than 37 weeks gestation) Yes No
Classify
Use the list boxes below to properly classify the incident. You may use the 'Add Another Classification' button to add as many as necessary.
Category
Subcategory
Type
Add Another Classification
Level of Harm to Patient (per AHRQ Scale):
Unsafe Condition - Any circumstance that increases the probability of a patient safety event.
Near Miss - Event occurred but did not reach patient.
No Harm - Reached patient, but no harm was evident.
Emotional Distress or Inconvenience - Mild and transient anxiety, pain, or physical discomfort.
Additional Treatment - Injury limited to additional intervention during admission but no other injury.
Temporary Harm - Bodily or psychological injury, but likely not permanent.
Permanent Harm - Lifelong bodily or psychological injury or increased susceptibility to disease.
Severe Permanent Harm - Severe lifelong bodily or psychological injury or disfigurement.
Death - Death at the time of the assessment.
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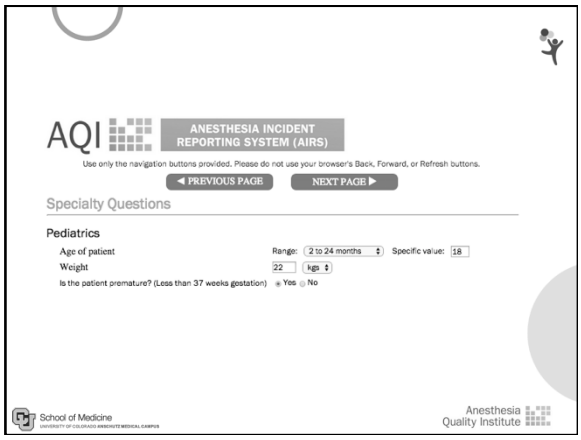
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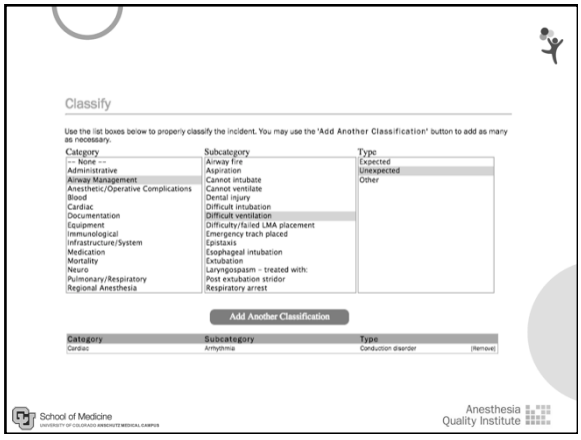
Classify
Use the list boxes below to properly classify the incident. You may use the 'Add Another Classification' button to add as many as necessary.
Category
Subcategory
Type
Airway Management
Difficult ventilation
Expected
Unexpected
Other
Add Another Classification
Category
Subcategory
Type
Cardiac
Arrhythmia
Conduction disorder
(Remove)
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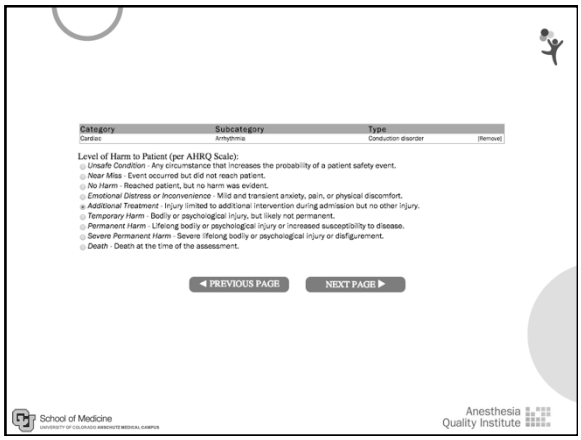
Category
Subcategory
Type
Cardiac
Arrhythmia
Conduction disorder
[Remove]
Level of Harm to Patient (per AHRQ Scale):
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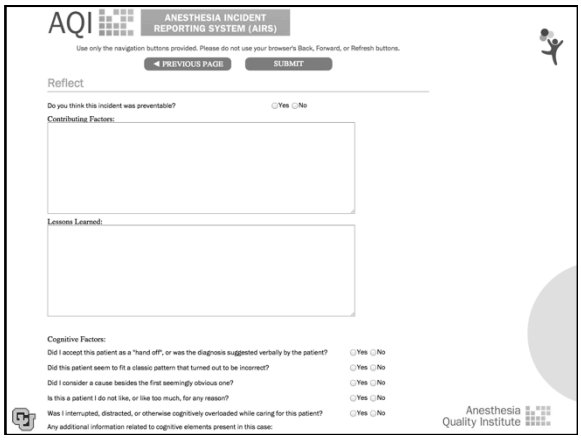
AQI
ANESTHESIA INCIDENT REPORTING SYSTEM (AIRS)
Use only the navigation buttons provided. Please do not use your browser's Back, Forward, or Refresh buttons.
◄ PREVIOUS PAGE
SUBMIT
Reflect
Do you think this incident was preventable?
Yes No
Contributing Factors:
Lessons Learned:
Cognitive Factors:
Did I accept this patient as a "hand off", or was the diagnosis suggested verbally by the patient?
Did this patient seem to fit a classic pattern that turned out to be incorrect?
Did I consider a cause besides the first seemingly obvious one?
Is this a patient I do not like, or like too much, for any reason?
Was I interrupted, distracted, or otherwise cognitively overloaded while caring for this patient?
Any additional information related to cognitive elements present in this case:
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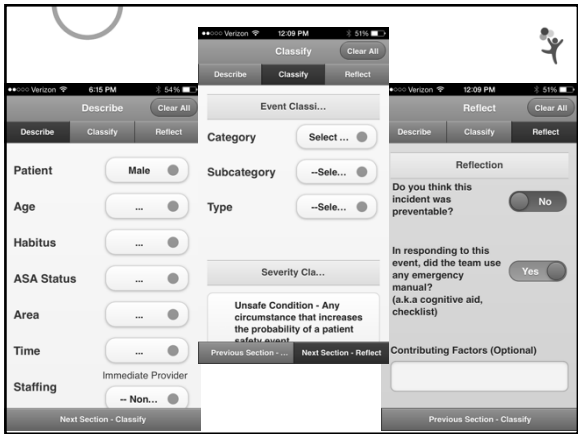
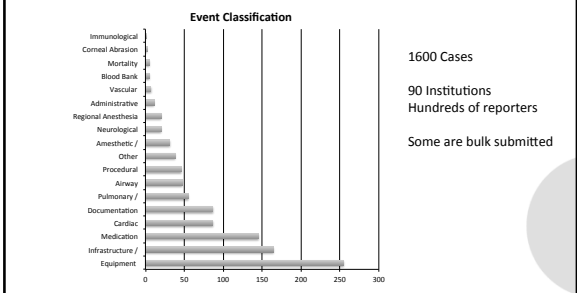

Describe
Clear All
Describe
Classify
Reflect
Patient
Male
Age
Habitus
ASA Status
Area
Time
Staffing
Immediate Provider
Next Section - Classify
Classify
Clear All
Event Classi...
Category
Select ...
Subcategory
--Sele...
Type
--Sele...
Severity Cla...
Unsafe Condition - Any circumstance that increases the probability of a patient
Previous Section - ...
Next Section - Reflect
Reflect
Clear All
Reflection
Do you think this incident was preventable?
No
In responding to this event, did the team use any emergency manual? (a.k.a cognitive aid, checklist)
Yes
Contributing Factors (Optional)
Previous Section - Classify

AIRS data



1600 Cases

90 Institutions
Hundreds of reporters

Some are bulk submitted

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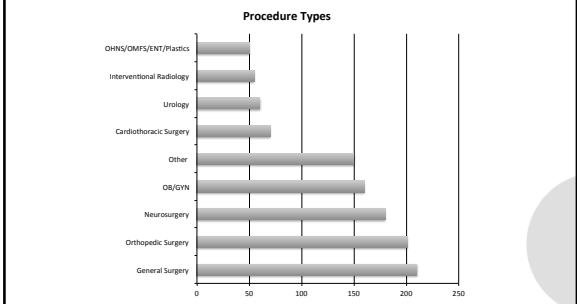
AIRS data



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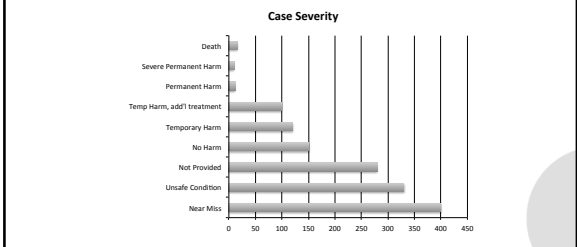
AIRS data



Cases preventable by 3:1

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Case Discussion

80yo F for ERCP gallstone pancreatitis

GETA (propofol, lidocaine, inhaled agent) stable vitals

1 hour in – EtCO2 35 ->5, Pulse ox perfusion 9->0.2
No pulse or blood pressure

Supine, CPR, Epi, Calcium, Bicarb, Vasopressin

Complete recovery

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Conclusions – ERCP Air embolus

GI and Radiology

ERCP – Airway, medications, 3 arrests

Pressurized air used during the procedure

Instrumentation used

Numerous case reports (21)

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Case Discussion

26 yo F for cosmetic surgery

Routine induction until patient started retching

Reached for suction, no suction

Copious vomiting

Bronchoscopy noted vomit in airway

Aspiration pneumonitis, 2 weeks in the ICU

Preventable

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Trending

Hazards of Electronic medical records and AIMS

Air embolus during ERCP

Drug errors due to shortages

Importance of teamwork

Place for cognitive aids

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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

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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

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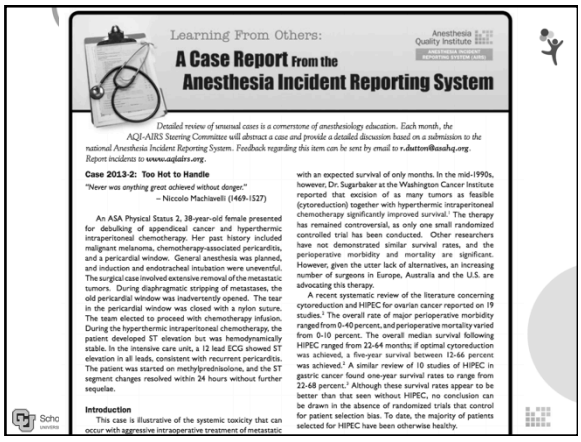

Learning From Others:

Anesthesia Quality Institute

A Case Report From the Anesthesia Incident Reporting System

Detailed review of unusual cases is a cornerstone of anesthesiology education. Each month, the AQI-AIRS Steering Committee will abstract a case and provide a detailed discussion based on a submission to the national Anesthesia Incident Reporting System. Feedback regarding this item can be sent by email to r.dutton@asahq.org. Report incidents to www.aqiairs.org.

Case 2013-2: Too Hot to Handle

"Never was anything great achieved without danger."
– Niccolo Machiavelli (1469-1527)

An ASA Physical Status 2, 38-year-old female presented for debulking of appendiceal cancer and hyperthermic intraperitoneal chemotherapy. Her past history included malignant melanoma, chemotherapy-associated pericarditis, and a pericardial window. General anesthesia was planned, and induction and endotracheal intubation were uneventful. The surgical case involved extensive removal of the metastatic tumors. During diaphragmatic stripping of metastases, the old pericardial window was inadvertently opened. The tear in the pericardial window was closed with a nylon suture. The team elected to proceed with chemotherapy infusion. During the hyperthermic intraperitoneal chemotherapy, the patient developed ST elevation but was hemodynamically stable. In the intensive care unit, a 12 lead ECG showed ST elevation in all leads, consistent with recurrent pericarditis. The patient was started on methylprednisolone, and the ST segment changes resolved within 24 hours without further sequelae.

Introduction

This case is illustrative of the systemic toxicity that can occur with aggressive intraoperative treatment of metastatic with an expected survival of only months. In the mid-1990s, however, Dr. Sugarbaker at the Washington Cancer Institute reported that excision of as many tumors as feasible (cytoreduction) together with hyperthermic intraperitoneal chemotherapy significantly improved survival.[1] The therapy has remained controversial, as only one small randomized controlled trial has been conducted. Other researchers have not demonstrated similar survival rates, and the perioperative morbidity and mortality are significant. However, given the utter lack of alternatives, an increasing number of surgeons in Europe, Australia and the U.S. are advocating this therapy.

A recent systematic review of the literature concerning cytoreduction and HIPEC for ovarian cancer reported on 19 studies.[2] The overall rate of major perioperative morbidity ranged from 0-40 percent, and perioperative mortality varied from 0-10 percent. The overall median survival following HIPEC ranged from 22-64 months; if optimal cytoreduction was achieved, a five-year survival between 12-66 percent was achieved.[2] A similar review of 10 studies of HIPEC in gastric cancer found one-year survival rates to range from 22-68 percent.[3] Although these survival rates appear to be better than that seen without HIPEC, no conclusion can be drawn in the absence of randomized trials that control for patient selection bias. To date, the majority of patients selected for HIPEC have been otherwise healthy.

Scho

AIRS Steering Committee

Meir Chernofsky, MD	Uniformed Services University
Richard Dutton, MD MBA	University of Chicago
Peter Fleischut, MD	New York Presbyterian Hospital
David Gaba, MD	Stanford University
Patrick Guffey, MD	University of Colorado
David Martin, MD	Mayo Clinic
Patrick McCormick MD	Mount Sinai
Alan Merry, MD	University of Auckland
Karen Nanji, MD	Massachusetts General Hospital
David Polaner, MD	University of Colorado
Stephen Pratt, MD	Beth Israel Deaconess
Mohamed Rehman, MD	Children's Hospital of Philadelphia
Keith Ruskin, MD	Yale University
Heather Sherman, PhD	AQI, AIRS Liaison
Marjorie Stiegler, MD	University of North Carolina, Chapel Hill
Avery Tung, MD	University of Chicago
Tetsu Uejima, MD	Children's Hospital of Chicago
Joyce Wahr, MD	University of Michigan
Jim Caldwell, MD	Founding Chair, Emeritus Member

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Integrating with the EMR

Good system design is integrated in workflow

What's the denominator?

Moving towards 100% event capture

Local vs hosted?

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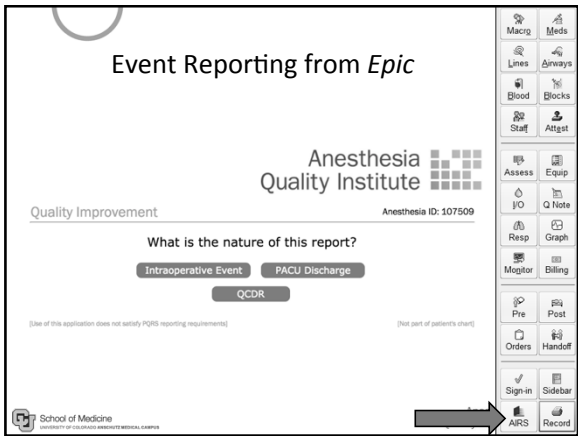
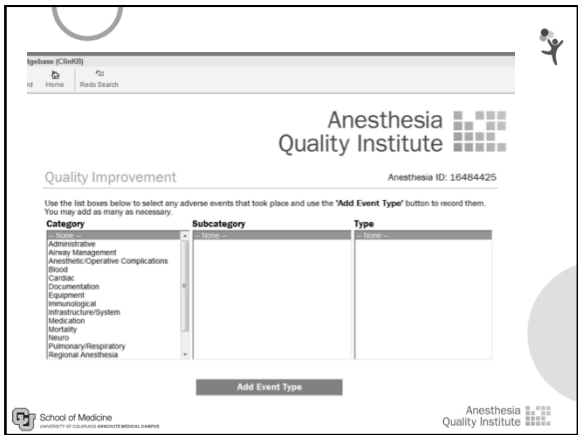

Event Reporting from *Epic*
Anesthesia Quality Institute
Quality Improvement
Anesthesia ID: 107509
What is the nature of this report?
Intraoperative Event
PACU Discharge
QCDR
[Use of this application does not satisfy PQRS reporting requirements]
[Not part of patient's chart]
School of Medicine
Macrg
Meds
Lines
Airways
Blood
Blocks
Staff
Attest
Assess
Equip
I/O
Q Note
Resp
Graph
Monitor
Billing
Pre
Post
Orders
Handoff
Sign-in
Sidebar
AIRS
Record


Anesthesia Quality Institute
Quality Improvement
Anesthesia ID: 16484425
Use the list boxes below to select any adverse events that took place and use the 'Add Event Type' button to record them.
You may add as many as necessary.
Category
Subcategory
Type
-- None --
Administrative
Airway Management
Anesthetic/Operative Complications
Blood
Cardiac
Documentation
Equipment
Immunological
Infrastructure/System
Medication
Mortality
Neuro
Pulmonary/Respiratory
Regional Anesthesia
Add Event Type
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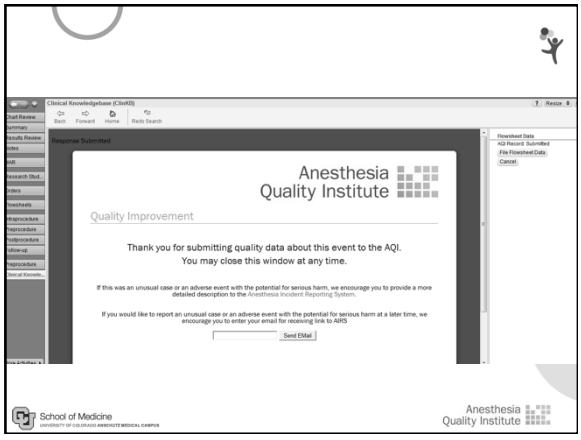
Anesthesia Quality Institute
Quality Improvement
Thank you for submitting quality data about this event to the AQI.
You may close this window at any time.
If this was an unusual case or an adverse event with the potential for serious harm, we encourage you to provide a more detailed description to the Anesthesia Incident Reporting System.
If you would like to report an unusual case or an adverse event with the potential for serious harm at a later time, we encourage you to enter your email for receiving link to AIRS
Send EMail
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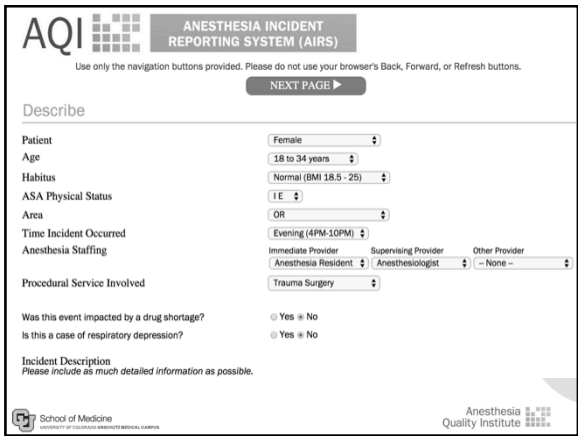

Event Reporting from *Epic*

Data sent to AQI

1. Institution ID (ID number given by AQI to provider group)
2. Anesthesia 52 CSN (NEF: This is the contact serial number for the anesthesia encounter)
3. HSB ID (NEF: This is a unique ID for the anesthesia record; the combo of the 52 and 53 encounters)
4. Service Date
5. ASA Score
6. Anesthesia Type
7. Case ID (ORL ID)
8. Service
9. Facility City
10. Facility State
11. Patient Age

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Event Reporting from *Epic*

Data sent to AQI

This second set of data will be passed in if the 4th parameter of your copy of LPP 89122 - AN QI Summary is set to "Yes" and the data is available:

1. Reporter First Name
2. Reporter Last Name
3. Reporter Gender
4. Reporter Years Practicing
5. Reporter Role
6. Reporter Email

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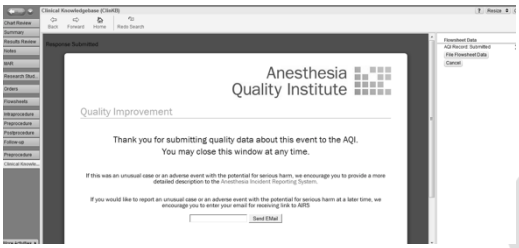
Event Reporting from *Epic*



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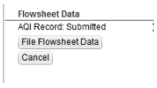
Event Reporting from *Epic*

Flowsheet row populated



Close Encounter checks

Hard stop vs. Soft stop

Forcing function to create a denominator

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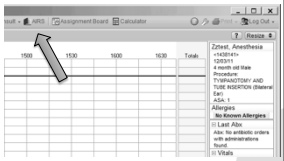
AIRS Options

Local AIRs system

Integration with QM software

Connection with NACOR

Reports back to participating groups



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Discussion

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

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Conclusions

Medical errors are preventable

System errors predominate

Incident reporting detects system errors

Strong system design leads to better reporting

National databases allow aggregation and earlier detection

Healthcare registries are everywhere - the goal is how do we maximize their potential

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