Non Operating Room Anesthesia: Perils, Pitfalls and Systems

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March 2016

No disclosures.

Objectives

- Review regulatory requirements for anesthesia in a remote location
- What are the challenges of providing anesthesia in these locations?
  - Patient
  - Procedure
  - Systems
- Review systemic challenges to provision of high quality anesthesia in challenging environments
- Discuss common approaches to improving safety and quality of anesthesia care in remote locations.

ASA Closed Claims Database

- 8496 closed claim database cases 1990-2010
- Excluded OB, chronic pain and acute pain cases
- 87 remote anesthesia locations / 3287 OR cases

- Remote cases:
  - Patients were sicker, case more likely to be emergent
  - MAC 50% in remote locations v. 6% in OR
  - Where do they occur?
    - 32% GI suite
    - 25% cardiac cath / EP
    - Other claims: lithotripsy, ED, radiology

Remote Location v. Operating Room

	Remote Location	Operating Room
Mortality	54%	29%
Respiratory/ Airway Events	44%	20%
Inadequate Oxygenation/Ventilation	21%	3%
Care Determined to be "Substandard"	54%	37%
Event Preventable with Better Monitoring	32%	8%
Median claim	$330,000	$210,000

Respiratory Depression and Oversedation

- 30% respiratory depressions due to sedation
  - >50% of GI suite cases
  - 70% of radiology cases
- Only 15% of these cases used capnography
- 92% of cases resulted in death or severe hypoxic brain injury
- 75% of these claims results in payment to the plaintiff
  - Median payment of $460,000

Metzner, Julia. Risks of Anesthesia in Remote Locations. *ASA Newsletter.* Volume 74, Number 2. February 2010

Metzner JL, Posner KL, Domino KB. The risk and safety of anesthesia at remote locations: The US closed claims analysis. *Curr Opin Anaesthesiology.* 2009; 22:502-508..

Remote Anesthesia: What *doesn't* change?

- Standards of anesthetic care
- Patient monitoring standards
- Equipment maintenance standards

Easier said than done.

ASA Recommendations

- Reliable oxygen source
- Available suction
- Gas scavenging system and anesthesia machine
- Hand resuscitation bag
- Monitoring equipment
- Electrical outlets for emergency power supply
- Proper illumination of patient and work areas
- Adequate work space
- Means of two way communication
- Emergency cart / defibrillator
- Compliance of facility with building and regulatory codes

Operating Room Safety

- Enhanced by standardization and reliability built into that environment
  - Protocols
  - Procedures
  - Experience level of staff / team
  - Familiarity with processes
  - Standard equipment
  - Regular schedule, less prone to frenzied preparation.

We rely on process RELIABILITY and RIGOR to conduct safe anesthetics...

Anticipating the Risks of Remote Anesthesia

- Sicker patients
- Procedural areas usually not designed with anesthesia in mind
- Support personnel not familiar with needs / process of anesthesia
  - Padding of pressure points, positioning issues
- Variability in equipment, monitoring, and environment
- Less efficient and effective scheduling.
- Inadequate monitoring of stock
- Team with which the anesthesiologist is unfamiliar
- Help is farther away

Engineering Safety in Remote Locations

- How to obtain ideal outcomes
  - NOT ONCE, but repeatedly, reliably
- Evaluating process steps upstream of the desired outcome
  - Defects rates determine reliability

LOW DEFECT RATES → RELIABILITY → LIKELIHOOD OF DESIRED OUTCOME

Achieving Reliability in Perioperative Settings

- Guidelines for anesthetic monitoring
- Interoperability of anesthesiologists
  - Promotes consistency of anesthetic approach
  - Flexibility
- Commitment to learning / teamwork
- Collaborative approach to care
- Organizational leaders engaged in reliability through use of data
- Learning, just culture

Ongoing Learning

- Multi-disciplinary groups of care givers
- Identification and evaluation of suboptimal outcomes
  - Reporting culture
  - Learning from near-miss events
- Anesthesia input is essential.

Improving Systems Safety

- Reasonable system for evaluating near-miss and patient harm events
  - System flaws are not mis-identified as individual flaws
- Willingness to report

- Just Culture algorithm for evaluating choices made by frontline providers

Marx D. Patient Safety and the "Just Culture": A Primer for Health Care Executives. New York: Columbia University, 2001.

"Just Culture"

HUMAN ERROR	AT RISK BEHAVIOR	RECKLESS BEHAVIOR
Inadvertant Action "It could have been me…."	A choice: Risk not recognized or thought to be justified	Conscious disregard of unreasonable risk
Manage through process change, training, system design	Manage by removing incentives for at-risk behaviors, mentoring, increasing situational awareness	Manage with remedial or punitive action
Take care of the person who made the error "second victim"		
CONSOLE	**COACH**	**PUNISH**

The Usual Scenario Plays Out….

- Anesthesia
- Delay
- Nursing
- Proceduralist

Systems Safety in Practice

At my institution, we have a formal team briefing prior to Out of OR cases:

    A. Always

    B. Most of the time

    C. Occasionally

    D. Never

Systems Safety in Practice

Who leads this briefing?

    A. Anesthesiologist Care Team member

    B. Surgeon / Proceduralist

    C. Nursing Staff

    D. Other

Improving System Safety - Briefing

- Implementations more successful when these are NOT run by physicians
  - In Out of OR locations, anesthesiologist may be most familiar with (and committed to OR processes, however…)
- Leadership engagement
- Every case – not just during crisis, high risk, etc.

Debriefing

At my institution, we perform a case debriefing at the case conclusion:

- A. Always
- B. Most of the Time
- C. Some of the Time
- D. Never

Debriefing

When a case debriefing is performed, who usually initiates and leads the process?

- A. Anesthesiologist
- B. Surgeon / Proceduralist
- C. Nursing Staff
- D. Other
- E. What debriefing?

Improving Systems Safety

- Debriefing
  - Teamwork
  - Systems improvement – continual learning

What did we do well?

What could we have done better?

Is there anything that we should do differently with the next patient?

Debriefing

- Local, structured conversation
- Takes less than 2 minutes
- Requires leadership support and expectation….

Simple concepts, difficult to implement

Communication

- Closed loop communication
- Critical Language
  - "Stopping the Line"
  - Great Catch
- Concerns which turn out to be incorrect should be an opportunity for learning

Leadership Engagement

- Meet regularly
- Identified liaison within anesthesiology to manage process improvement and service line collaboration
- Lack of leadership engagement shows up in deterioration of processes over time….

Challenges in Out of OR Anesthesia

CASE 1:

75 year old male, 100kg scheduled for ERCP under MAC

Monitoring included pulse oximetry, BP cuff, and ECG.

Incremental doses of midazolam (4mg), fentanyl (200 mcg) were given without adequate effect

Propofol 20 mg then 50-70 mg/kg/min

Saturations from 92% on 4L NC to 70%, ensuing bradycardia

Difficult and delayed resuscitation resulted in hypoxic brain injury.

At my institution

Sedation for endoscopic (ERCP) procedures is directed by
A. Proceduralist
B. Anesthesiologist
C. Other
D. I'm not sure

At my institution

GI Proceduralists are able to administer propofol for endoscopic procedures
A. Yes
B. ASA 1-2 patients only
C. No, propofol administration requires an anesthesiologist to be present

CASE 2 (coordinate with Dan Beck)

CASE 3 (coordinate with Dan Beck)