

# A Look at Closed Claims

## Where and how can we improve?



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### Looking at the past to improve the future:

- Ethical considerations preclude direct, prospective experimentation to quantify risks and predict outcomes associated with differences in anesthesia practice.
- Prospective nonexperimental studies are prohibitively expensive for rare events, such as anesthesia incidents.
- Retrospective studies are therefore the norm, including examination of closed malpractice claims.



### Definitions:

- **Malpractice claim:** demand for financial compensation for an injury resulting from medical care.
- **Closed malpractice claim:** claim is dropped or settled by the parties or adjudicated by the courts.
- **Closed Claim Analysis:** closed claim file is reviewed by a practicing provider and consists of relevant hospital & medical records, narrative statement from involved healthcare personnel, expert & peer reviews, summaries of depositions, outcome reports, and cost of settlement.
  - Standardized form for data collection



### ASA Closed Claims Project




- Initiated in 1984
  - Currently contains approx 8000 claims dating back to 1962 from 35 participating insurance carriers.
    - Excludes claims for dental damage
- Propose: improve patient safety and address rising insurance costs by identifying the scope and cause of significant anesthesia-related patient injuries.
- Barriers: malpractice insurance companies were reluctant to provide information out of concern for confidentiality.




- Initial findings: unexpected group of claims (14 out of 900) that involved sudden cardiac arrest in relatively healthy patients who had received spinal anesthesia.
  - Sudden appearance of bradycardia & hypotension, which rapidly progressed to asystole.
  - Despite seemingly appropriate pharmacological therapy & chest compressions, there were 6 patient deaths and 7 patients with severe brain damage.




- Clinical practice changes initiated as a result of peer review of the 14 cases:
  - Use of pulse oximetry
  - Early use of epinephrine for treatment of bradycardia when it is not responsive to atropine or ephedrine
  - Immediate use of full resuscitation dose of epinephrine if asystole occurred
    - Chest compression ineffective in the presence of a high sympathetic blockade.



## Subsequent Clinical Practice Changes



- Standards requiring use of pulse oximetry intraoperatively (1989)
- Use of ET $\text{CO}_2$  for verification of tracheal intubation (1990)
- ASA Practice Guidelines for Management of the Difficult Airway (1993)
- Practice Advisory for the Prevention of Perioperative Peripheral Neuropathies (2000)
- Practice Advisory for Perioperative Visual Loss Associated with Spine Surgery (2006)
- Statement on Respiratory monitoring During Endoscopic Procedures (2009)




- **Development of additional registries for:**
  - Pediatric perioperative cardiac arrest
  - Postoperative visual loss
  - Anesthesia awareness




## ASA's Overall Findings 1990 - 2005




- Outcome of death or brain damage occurs in 32% of all claims.
  - This outcome was precipitated by respiratory events in 45% of cases.
    - Inadequate ventilation – 7%
    - Esophageal intubation – 7%
    - Difficult intubation – 12%
  - This outcome was attributable to a cardiovascular event in 25% of cases.




- Nerve injury represents the second most common outcome at 21% of all claims.
  - Ulnar – 25%
  - Brachial plexus – 19%
  - Padding undocumented – 57% (AANA)
  - Positioning undocumented – 55% (AANA)




- Central venous catheter – 16.5%
  - Severity of injury
    - Death – 47%
    - Permanent/disabling – 11%
    - Temporary/nondisabling – 42%
  - Specific injury
    - Wire/catheter embolus – 18%
    - Cardiac tamponade – 14.5%
    - Carotid artery puncture/cannulation – 14.5%
    - Hemothorax – 14%
    - Pneumothorax – 13%
  - 45% of claims deemed preventable by implementing ultrasound, waveform to confirm cannulation of vein, CXR, interval or continuous waveform monitoring




- Airway injury – 8%
  - Had difficult intubation as a contributing factor – 38%
  - Sustained brain damage or death – 9%
  - Site:
    - Larynx- 34%
    - Pharynx- 17%
    - Esophagus – 16%
    - Trachea – 14%
    - TMJ – 10%




- PACU – 7%
  - Death or brain injury as outcome – 75%
  - Preventable with pulse oximetry or capnometry – 39%
- Burns – 6%
  - IV bags – 35%
  - Warmers – 23%
  - Cautery fires – 19%
  - Cautery without fire – 12%
  - Laser in airway – 2%



- Awareness or emotional distress – 5%
  - Care judged substandard in 96% of cases & was attributed to medication error
- Eye injury – 5%
- Backache – 5%
- Medication error – 4%
  - Incorrect dose – 24%
  - Administration of wrong drug – 17%
- Pneumothorax – 4%



- Aspiration pneumonitis – 3%
  - Induction – 67%
  - Intraoperatively – 19%
  - Post-procedure – 12%
  - Regional anesthesia or MAC – 12%
  - Documented cricoid pressure during induction – 45%
  - Associated with death or brain damage – 60%
  - Conclusion: Reexamination effectiveness of cricoid pressure
- Gas delivery system – 2%
  - Documented misuse – 75%
  - Machine failure – 25%



## Special Settings or Circumstances



- Monitored Anesthesia Care – 6%
- Higher proportion of patients over 70 years and ASA III-V
- Eye surgery – 20%
  - Inadequate anesthesia/patient movement – 11%
- Reconstructive or plastic surgery in head and neck area – 20%
- MAC was represented in the claims for death outcomes at the same rate as general and regional anesthesia
- Respiratory events (24%) similar to general anesthesia but higher than regional anesthesia (4%)
  - Inadequate oxygenation/ventilation – 18%
- Equipment failure/malfunction – 21%
  - Caution fires – 17%
- Injuries judged as preventable – 50%



- Conclusion:
  - Oversedation
    - 2 or more medications (75%)
      - Sedative-analgesic-hypnotic
    - Additive or synergistic effects
    - Increased incident of hypoxemia and apnea
  - Monitoring
  - Vigilance
  - Open face draping technique
  - Lowest possible flow rate of supplemental oxygen
  - Use of compressed air instead of oxygen to prevent buildup of carbon dioxide
  - Stopping oxygen flow 60 seconds before use of electrocautery
  - Avoidance of alcohol-based prep solutions
  - Awareness of causation of surgical fires



- Difficult airway management – 179 claims between 1993 to 2003
  - Perioperative care – 87% (60% induction, 15% surgery, 12% extubation, 5% recovery)
    - Death – 46%
    - Brain damage – 12%
    - Airway injury – 32%
    - Less than appropriate care – 47%
    - No documented airway assessment – 8%
    - Difficult airway anticipated – 50%
  - Outside locations – 13%
    - Death – 87%
    - Brain damage – 13%
    - Airway injury – 0%
    - Less than appropriate care – 43%
    - ETT change – 25%
    - Nonsurgical care – 50%




- Conclusion:
  - Death and brain death from difficult airway management associated with induction has decreased from the previous decade.
    - There is no change in claims associated with maintenance, extubation, or recovery.
  - Difficult Airway Guidelines need to be applied throughout the perioperative period.
    - Update guidelines to reflect this
  - MAC and regional anesthesia do not obviate the need for a strategy for intubation of the difficult airway.
  - Preformulated reintubation plan
    - Bougie or tube changer
  - Surgeon presence in OR, ready to perform a surgical airway in known difficult airways.



- ASC claims 23% of total database
  - Had higher percentage of MAC, regional and temporary (62%) injuries.
  - Lower percentage of respiratory events – 22%
  - Death – 21%
  - Location:
    - Intra-anesthesia & Recovery phase – similar to OBA
    - After discharge – 7%
  - Preventable by better monitoring – 13%
- OBA claims 0.3% of total database
  - Higher percentage of death (64%), respiratory events (50%), preventable outcomes, and drug errors or reactions (25%)
  - Temporary and non-disabling injury – 21%
  - Location:
    - Intra-anesthesia – 64%
    - Recovery phase – 14%
    - After discharge – 21%
  - Preventable by better monitoring – 46%
    - All adverse respiratory events in recovery or postoperative period
    - All preventable with use of pulse oximetry
  - Recommendation: focus safety efforts on improving care in recovery & postoperative period




- Remote locations – 3.7%
  - Claims involve older and sicker patients
  - MAC – 50%
  - Death – 54%
  - Respiratory events – 44%
    - Inadequate oxygenation/ventilation – 21%
  - Judged as being preventable – 32%
- Conclusion: Poses significant risk, particularly for over-sedation and inadequate oxygenation/ventilation during MAC.
- Recommendation: Similar anesthesia and monitoring standards and guidelines should be used in all anesthesia care areas.




- Obstetric event claims – 10%
  - Maternal death – 12% / Brain damage – 6%
    - Failure to secure an airway – 90%
    - Higher incidence of obesity versus non-obstetric claims – 25% vs 19% - May contribute to difficult intubation
  - Aspiration pneumonia – 1%
    - All most eliminated over the past decade
  - Maternal HA (14%), back pain (10% - doubled in past decade), emotional distress (8%)
    - Correlated with patient dissatisfaction and use of regional anesthesia (70%)
  - Maternal nerve injury – 20%
    - Doubled over the past decade
  - Neonatal death – 27%
  - Newborn brain damage – 22%
- Recommendation: anticipating and preparing for airway difficulties and using protocols specific to the OB population, which consider concurrent needs of mother and child.




- Pediatric event claims (< 16 years) – 10%
  - Death – 50%
  - Respiratory events – 43%
  - Cardiovascular events -27%
    - 67% occur during maintenance
    - 56% attributable to electrolyte imbalance, fluid therapy, CPB
  - No discernable precipitating injury - 42%
  - Died within 24 hours – 43%
  - Wrong medication dose – 53%
  - Equipment malfunction – 15%
    - Burns – 4%
- Conclusions:
  - Early detection of bleeding and aspiration after T&A
  - Prompt recognition and treatment of blood loss in infants
  - Avoiding use of hot water and saline bottles for warming
  - Appropriate doses of medications




- Trauma anesthesia claims – 4.8%
  - Emergency anesthesia and surgery – 72%
  - ASA III to V – 51%
  - Death – 40.3%
  - No difference from nontrauma claims for aspiration, brain damage, difficulty of intubation, intraoperative awareness, standard of care, or adequacy of record
- Consent claims – 1%
  - Provider failed to honor a patient request or failed to discuss a specific complication or change in anesthesia plan



**AANA Foundation  
Closed Claims Database**



- Initiated in 2001
- ASA Closed Claims Project only included anesthesiologists, not CRNAs.
- Reflects 223 cases from a 1-time review by 8 CRNAs selected by the AANAF Board of Directors of CRNA records of the St. Paul Fire and Marine Insurance Company.
- All cases occurred between 1989 - 1997 and were closed between 1995 - 1997.



### Overall Findings:

- CRNA-related incidents reflected an outcome of death or brain injury in 44% of all claims.
- 39% reflected a contributing respiratory event.
  - 68% of claims reflecting a respiratory event had a death or brain injury outcome.
  - 61% of the reported CRNA-related death or brain injury outcomes may be attributable to a respiratory event.



- CRNA lack of vigilance was a contributing factor in 79% of claims.
- Worse outcomes were correlated with inappropriate care, lack of vigilance, preventable outcomes, and respiratory or airway incidents.
- Worse outcomes were not correlated with preoperative physical status, patient age, type of surgery or procedure, age of anesthesia provider, or year of certification of the CRNA.



- When comparing practice models, there was no difference in outcome, injury severity, appropriateness of care, adequacy of preinduction activities, vigilance of the CRNA, preventability of outcome, use of pulse oximetry or inspired oxygen monitoring, or presence of a contributing respiratory or airway incident.



### Obstetric Anesthesia Claims:

- N = 41
- CRNA alone – 85%
- CRNA/anesthesiologist – 15%
- Community hospital – 71%
- Risk factors for adverse outcomes:
  - Advanced maternal age
  - Ethnicity
    - Minority patients had higher mortality rate (86% vs 36%)
  - Obesity



- Emergency c-section requiring general anesthesia at risk for sentinel events
- Most common adverse outcome was neonatal death – 27%
- Maternal death – 22%
- Complications from regional anesthesia – 20%
- Leading cause of maternal death/brain damage was failure to secure an airway.
- Anesthetic care deemed inappropriate – 44%



### Nerve Injury Claims:

- N = 44
- Brachial plexus – 34%
- Ulnar – 16%
- Radial – 11%
- Peroneal – 9%
- Paraplegia – 9%
- Lumbosacral injury – 7%
- "Other" injuries – 18%
  - Sciatic, femoral, musculocutaneous, recurrent laryngeal, median, facial
- Lacked documentation regarding padding and positioning – 73%



## Limitations of Closed Claims Analysis



- Retrospective
  - Cannot establish cause-and-effect
- Nonrandomized data collection
- Lack of denominator data
- Only provides an indirect assessment of complications and liability risks.
- Successful management is not likely to result in legal action, therefore the relative safety/efficacy can not be estimated.



- Malpractice claims are biased by the presence of substandard care and severe injuries.
- Because of the time delay between occurrence of an injury and its appearance within the database (3-6 years), the influence of new technology and training on liability cannot be fully evaluated.
- Closed claims analysis is useful for generating hypotheses about the mechanism and prevention of injuries, it cannot be used for testing of those hypotheses.



SO...

How do you think we are doing?

Where can we improve?



## Questions

Thank You

