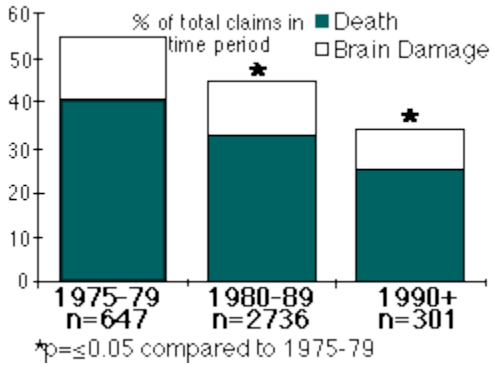
Cheney FW: Anesthesia patient safety and professional liability continue to improve. *ASA Newsletter* 61(6):18-20, 1997.

Full Text

The most recent data from the ASA Committee on Professional Liability's Closed Claims Project suggest that severe anesthesia-related injuries such as death and brain damage are becoming less frequent. This standardized collection of case summaries of adverse anesthesia related outcomes has been ongoing since 1985 and now contains about 4,000 claims from 35 insurance companies that insure approximately 14,500 anesthesiologists.

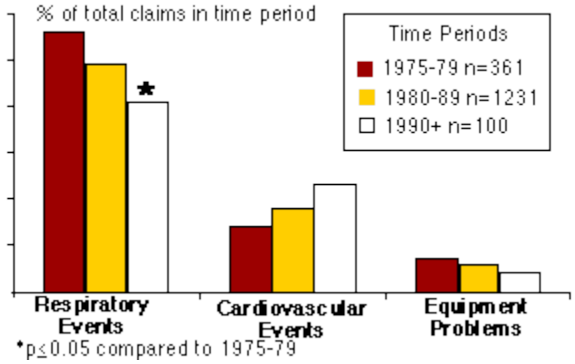
In the 1970s, 56 percent of all claims were for death or permanent brain damage as compared to 45 percent in the 1980s and 31 percent in the 1990s [Figure 1]. The most common source of damaging event or mechanism of causation of death or brain damage is the respiratory system. Over time, there has been a significant downward trend in the number of claims for death or brain damage caused by respiratory system damaging events: in the 1970s, 55 percent; in the 1980s, 50 percent; and in the 1990s, 45 percent ($p<0.05$ compared to 1975-79) of total claims for death or brain damage involved the respiratory system [Figure 2].

Figure 1



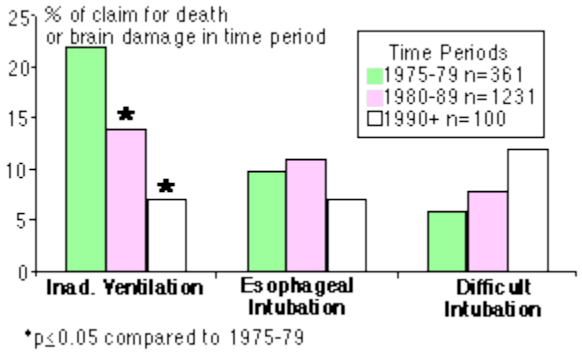
On the other hand, cardiovascular damaging events showed just the opposite trend in that they were responsible for 12 percent of claims for death and brain damage in the 1970s, 18 percent in the 1980s and 24 percent in the 1990s [Figure 2]. Equipment-related claims for death and brain damage showed a slight downward trend over the three decades [Figure 2]. As compared to earlier decades, the number of claims in the 1990s are too few to achieve statistical differences in the cardiovascular or equipment groups.

Figure 2



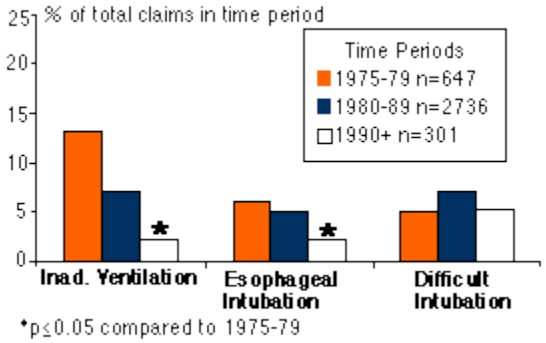
The three most common respiratory system damaging events causing death or brain damage are inadequate ventilation, esophageal intubation and difficult intubation [Figure 3]. The most marked reduction among these damaging events was in claims for inadequate ventilation, which represented 22 percent of all claims for death or brain damage in the 1970s, 15 percent in the 1980s and only 7 percent in the 1990s [Figure 3]. The incidence of esophageal intubation tended to decrease as a mechanism of death or brain damage in the 1990s [Figure 3]. Difficult intubation as a cause of death or brain damage increased from 5 percent in the 1970s to 12 percent in the 1990s [Figure 3]. The number of claims in the 1990s are too few for this increase in injuries due to difficult intubation to reach statistical significance.

Figure 3



The question arises as to why claims for death or brain damage have been decreasing since the 1970s. One answer would seem to be that pulse oximetry (SpO_2) and end-tidal CO_2 ($ETCO_2$) have had a major impact on the continuing improvement in anesthesia patient safety, although the trend seems to have started before their widespread use [Figure 2]. These two monitors came into use in the mid to late 1980s and became ASA standards of practice in the early 1990s. The beneficial effect of improved monitoring is supported by the fact that claims for injury due to inadequate ventilation and esophageal intubation have decreased in the 1990s while those for difficult intubation have not [Figure 4].

Figure 4



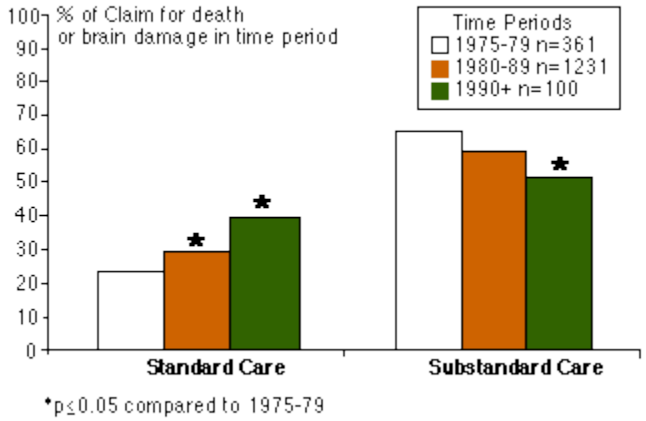
SpO_2 and $ETCO_2$ monitoring would be expected to have the greatest effect on the occurrence of injuries from inadequate ventilation and esophageal intubation and the least effect on injuries from difficult intubation. This is not surprising, as placement of an endotracheal tube is a technical act and monitors do not themselves place endotracheal tubes. (SpO_2 monitoring might give an earlier warning of hypoxemia in the patient in whom tracheal intubation is being unsuccessfully attempted.) Thus, the practitioner could direct attention to treating hypoxemia before it could cause injury. However, SpO_2 monitoring does not seem to have affected the data collected to date [Figure 3].

In an analysis of closed claims data from the 1970s and mid-1980s, Caplan et al.[1] suggested that injury from difficult intubation would not be prevented by monitoring and that other strategies would be necessary to prevent these adverse outcomes. As a result, the ASA appointed a Task Force on Guidelines for Management of the Difficult Airway, which developed an evidence-based practice guideline published in 1993.[2] The impact of this practice guideline, if present, will not be reflected in the ASA Closed Claims Project database for several years as it takes about five years for an adverse event for which a claim of malpractice is made to be included in the database.

The Closed Claims Project Subcommittee is now evaluating the role of the practice guideline in its review of all new closed claims for injury due to difficult intubation. These data should, in time, reveal whether the guideline is being followed in clinical practice and, if so, if it is affecting the occurrence of injuries from difficult intubation. This is an unusual method of evaluation utilizing a unique database (closed claims) but is important because most evidence-based practice guidelines do not have any methodologies in place to evaluate their impact on clinical practice or patient safety.

Correlated with the aforementioned apparent improvement in patient safety is an improvement in anesthesia liability. The proportion of claims for death or brain damage in which care was judged by the reviewers as below the standard of care at the time of the event declined from 65 percent in the 1970s to 59 percent in the 1980s to 51 percent ($p<.05$ compared to the 1970s) in the early 1990s [Figure 5]. It is too early to tell if this encouraging trend reflects a differential in the length of claims litigation rather than a true improvement in anesthesia care because claims with clearly good care may close more quickly than others.

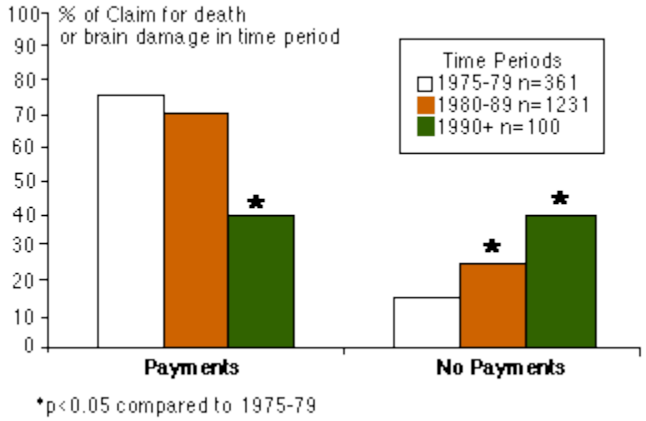
Figure 5



It should be noted, however, that the Closed Claims Project database reflects only claims and not all patient injuries, so this liability pattern may reflect changes in litigation rather than the quality of anesthesia care. It is possible that plaintiff attorneys are pursuing claims for death or brain damage that have weaker evidence of substandard care in the 1990s compared to earlier time periods. If this is the case, the good news is that fewer claims for death or brain damage are successfully pursued.

Another encouraging trend is that the proportion of claims for death and brain damage that resulted in payment to the plaintiff has declined from 74 percent in the late 1970s to only 40 percent in the early 1990s ($p<.05$) [Figure 6]. In fact, among the 100 death or brain damage claims from the 1990s that have closed and been entered into the database thus far, just as many were successfully defended without payment as those that resulted in payment to the plaintiff. This is a striking contrast from earlier trends in which the majority of such claims resulted in pay-out [Figure 6].

Figure 6



As data from the 1990s accumulate, it is encouraging to see a continuing reduction in claims for death or brain damage and an improvement in the liability profile. Cardiovascular mechanisms of injury are becoming more prominent as respiratory system mechanisms are

decreasing. This may reflect the fact that SpO_2 monitoring allows a more accurate diagnosis of the exact mechanism of injury.

References

1. Caplan RA, Posner KL, Ward RJ, Cheney FW. Adverse respiratory events in anesthesia: A closed claims analysis. *Anesthesiology*. 1990; 72:828-833. [Abstract]

2. Caplan RA, Benumof JL, Berry FA, Blitt CD, Bode RH, Cheney FW, Connis RT, Guidry OF, Ovassapian A. Practice guidelines for management of the difficult airway: A report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. *Anesthesiology.* 1993; 78:597-602.

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