

## **Citation**

Adeogba SA, Posner KL, Stephens LS, Domino KB. Central Venous Catheter Complications: Closed Claims Update. *Anesthesiology*, A1075, 2012.

## **Abstract**

### **Background**

We previously reported that malpractice claims for central venous catheter (CVC) injuries had high proportions of severe injury and death.<sup>1</sup> In light of the introduction of ultrasound technology and the recent ASA Practice Guidelines<sup>2</sup>, we reviewed the most recent closed malpractice claims related to CVC access and use in the ASA Closed Claims Project database.

### **Methods**

After IRB approval, we compared closed malpractice claims for CVC injuries to all other claims (excluding acute and chronic pain claims) from a database of 9,536 claims. CVC injuries that occurred between 1995 and 2009 (n=92) were compared to those that occurred between 1970 and 1994 (n=96). All payments were CPI-adjusted to 2011 dollars. Findings were assessed using Kolmogorov-Smirnov and Fisher's exact test using  $p < 0.05$  for statistical significance.

### **Results**

The majority (59%) of CVC claims from 1995-2009 resulted in death or permanent brain damage (death/BD,  $p < 0.001$  compared to 39% of non-CVC claims). Death/BD for 1995-2009 CVC claims was not different from CVC claims that occurred in 1970-94 ( $p = 0.4$ ). Most CVC claims from 1995-2009 demonstrated complications related to access rather than use of CVCs. Complications related to access increased to 87% of 1995-2009 CVC claims compared to 63% in 1970-94 ( $p < 0.001$ ). The most common complication, carotid cannulation/puncture, increased to 24% in 1995-2009 compared to 14% in earlier CVC claims ( $p = 0.05$ ). Other common complications (hemothorax 17%, catheter/wire embolus 11%, pneumothorax 10%, and cardiac tamponade 9%) remained comparable over time (Figure). During the later time period, 50% of CVC claims were assessed as preventable by ultrasound and 41% by pressure wave form monitoring compared to 25% and 21% respectively in the earlier time period ( $p < 0.01$ ). Greater than half (57%) of recent CVC claims were possibly preventable by one or both modalities. Most CVC claims (61%) resulted in payment, with no significant differences between time periods in payment rates or amounts. Median payment in CVC claims from 1995-2009 was \$226,400 (range \$1,250-\$9,039,000).

### **Discussion**

Malpractice claims for central venous catheter complications still have a higher rate of death and brain damage than other anesthesia malpractice claims. Carotid cannulation or puncture increased significantly in recent claims. A significant proportion of poor outcomes could have been preventable by the use of ultrasound or pressure wave monitoring, consistent with recommendations from the recent ASA central venous access guidelines.<sup>2</sup>

**References:**

1. Domino et al. Anesthesiology 2004; 100:1411-8.
2. Anesthesiology 2012; 116:539-73.

Figure 1

## Most Common Central Line Complications

