

## **Citation**

Mehta SP, Posner KL, Domino KB. Burns from Warming Devices and Heated Materials: A Closed Claims Update. *Anesthesiology*, A1079, 2012.

## **Abstract**

### **Background**

Maintaining normothermia benefits not only the patient, but also the hospital, by reducing a patient's time to recovery and the number of surgical site infections. Warming devices are typically used in the perioperative period to maintain normal body temperature or treat hypothermia. Over 15 years ago, we reported complications from the improper use of warming devices and heated materials.<sup>1</sup> Since warming devices have changed dramatically since that report, we analyzed thermal burn injuries caused by warming devices and heated materials in the operating room from 1995-2010 from the ASA Closed Claims Project Database and compared them to burns occurring prior to our earlier report.<sup>1</sup>

### **Methods**

After IRB approval, we reviewed the ASA Closed Claims Project Database of 9536 total claims. Claims arising from chronic or acute pain management (n=1231) were excluded. Warming devices used in the operating room included heating lamps, warming blankets, and forced-air warming blankets. Heated material consisted of warm intravenous (IV) solution bags and warm fluid bottles as well as hot compresses. All payments were CPI-adjusted to 2011 dollars. Comparisons of payments between time periods (1970-94 vs. 1995-2010) were analyzed by Mann-Whitney U test. P<0.01 was deemed significant.

### **Results**

Burn injuries from warming devices or heated materials represented 1% of claims from both time periods. New burn injuries (1995 and later, n=41) more commonly resulted from the use of devices or materials for patient warming (n=25, 61%) than other purposes (n=17, 41%; 1 claim involved both uses). Other uses of heated materials included positioning, treatment of IV infiltration, and softening of a nasal-tracheal tube. Warming devices in 1995-2010 were primarily used for warming the patient to prevent hypothermia, and the most common location of burns from these devices involved the buttocks and legs, including thighs and feet (14 of 19, 74%). The most common cause of burn injuries from forced air warming devices was use of the hose without the appropriate blanket attachment (13 of 15, 87%). Heated materials (17 bags/bottles, 1 compress) were more commonly used for patient positioning (n=13) than warming (n=5), and the most common location of burns from heated materials was the trunk, including the axilla (11 of 22, 50%). The proportion of burn claims that resulted in payment did not change over time: 83% were paid in both time periods. Payments for new burn claims (median \$97,980; range \$7,000-\$858,000) were higher than 1970-94 payments (p<0.01).

## Conclusions

Patients continue to suffer burn injuries from the misuse of forced-air warming units.<sup>2</sup> Injuries can be prevented by ensuring proper attachment of the appropriate blanket device to the hose of the warming unit.<sup>3-4</sup> Burn injuries from the misuse of heated material (IV bags and bottles) continue to occur when these heated materials are used for generalized warming, patient positioning, or other purposes. Avoiding these heated materials altogether for patient positioning will minimize the occurrence of burn injuries. Warming devices and heated materials should be utilized for their intended purpose as deviation may result in severe burn injury to the patient.

1. Cheney et al. *Anesthesiology* 1994; 80(4):806-10.
2. Uzun et al. *J Anesth* 2010; 24(6):980-1.
3. <http://www.apsf.org/newsletters/html/2002/spring/13warmingdevices.htm>
4. <http://www.apsf.org/newsletters/html/2002/fall/09reportevents.htm>

Copyright © 2012 American Society of Anesthesiologists