The importance of periodic hyperinflation of the lungs during anesthesia has been stressed by many anesthesiologists. Bendixen and Laver\(^1\) recommended that passive hyperinflation to at least three times the average tidal volume be carried out every ten to 15 minutes. The ventilatory pattern of the Engström respirator favors an even distribution of gases in the lungs.\(^2\) This may, however, not be effective enough during prolonged anesthesia.

Periodic sighs may also be advantageous even with this ventilator.

Figure 1 shows a simple device for sighing. The air-dosage valve (1) of the ventilator is connected with a two-liter respiration bag (2). The other end of the bag is connected by means of a T-piece (3) between the rotameter unit (4) and the inlet stop-cock (5) of the ventilator. A slow filling of the reservoir bag is accomplished by a mechanical resistor (6). The air-dosage valve of the ventilator is equipped with an adjustable set-stop (7) which can be adjusted to any volume indicated.

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on the scale. The pop-off valve of the water trap (S) should be in the “Danger” position (maximum tracheal pressure 70 cm./H₂O). When a sigh is desired the air dosage valve is quickly turned to the volume indicated by the set-stop (at least double the fresh gas flow). During the expiratory cycle the respiration bag of the ventilator is thus filled by a large volume of the anesthetic gas mixture. The valve is then turned back to zero position. If it is left open only two to three sighs are possible before the reservoir bag is emptied. Tracheal pressures double the normal can be created easily. If higher pressures are desirable the pressure regulator of the ventilator (9) must be turned to higher readings.

REFERENCES

Thermal Burns Caused by Warming Blankets in the Operating Room

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Two cases are presented to direct attention to circumstances in which thermal burns can occur with use of warming blankets which are not defective and which are operating within "safe" temperature limits.

CASE 1

A 63-year-old white man weighing 187 pounds was admitted with the diagnosis of bilateral iliac artery occlusion, arteriosclerotic heart disease, and diabetes mellitus. A warming blanket was placed on the operating room table, under the patient's hips and lower back, because of the anticipated prolonged surgical time. This blanket was covered by a double layer of drape sheet and the blanket's temperature regulator was set at 100°F. The patient underwent an aorto-bifemoral bypass with dacron graft placement and uneventful general anesthesia. The total time for the procedure was six hours and 15 minutes. After several hours in the recovery area, the patient was returned to the operating room for further surgery. This procedure required an additional hour and 45 minutes. The postoperative course was then uncomplicated until the second postoperative day when the patient began to complain of severe discomfort in the sacral area. On examination he was found to have an area of burn over the sacrum estimated to be 40 per cent third-degree, 60 per cent second-degree, with strips of second degree burn extending over the buttocks. The area of burn corresponded to the location of the warming blanket used during surgery and the pattern of burn to the fluid channels in the coils of the warming blanket (fig. 1).

CASE 2

A 67-year-old white woman weighing about 150 pounds was admitted with gangrene of the right great toe and diabetes mellitus. After attempts to control the diabetes, she underwent an aorto-bifemoral bypass graft under general anesthesia. A warming blanket covered by a sheet was placed under the patient's shoulders and midback. The total operating time was seven hours and 15 minutes. On the second postoperative day the patient complained of "soreness" over her upper back. Examination revealed several areas of second-degree burn in a symmetrical pattern over the midthoracic area. Linear areas of erythema extended along the back and corresponded in spacing to the fluid channels in the warming blanket.

DISCUSSION

In both cases the most severe injury occurred in areas of greatest pressure, namely, over bony prominences. Both patients were diabetic, moderately obese, and had some degree of vascular insufficiency. Preparative solutions used for skin cleansing may have predisposed to this injury. The pattern of burn in each case corresponded exactly to the