results using Sus-Phrine epinephrine, which suggested that smaller doses of epinephrine might not be effective in enabling learning in isoflurane-treated animals.

Finally, investigators in the area of learning and memory during anesthesia stress the importance of replication of earlier studies in this field.[4,5] To quote from a recent correspondence on the subject,[5] "Without replication and given the number of negative findings, all evidence for memory during anaesthesia may always be interpreted as chance findings." It is, therefore, our sincere hope that Weinberger and Gold and other talented researchers will *extend* the results of the two studies referred to in these letters using a *stable anesthetic concentration of a drug currently used in clinical practice.*

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(Accepted for publication October 3, 1994.)

Anesthesiology
82:310–311, 1995

Hazard of Small-gauge Needles

To the Editor:—Awareness of needlestick hazards has led to recommendations prohibiting "two-handed" recapping of needles.[1] Despite this, healthcare workers continue to recap needles for a variety of reasons. When preparing for cutaneous anesthesia before an invasive procedure in an awake patient, the usual practice is to aspirate a local anesthetic solution into a syringe and recap the needle to ensure sterility before its use. Recapping the 25- or 26-G needle used to administer cutaneous local anesthetic appears to be associated with an unusual form of needlestick injury.

A pilot survey of 100 anesthesiology residents revealed that approximately 50% of respondents reported needlestick injuries produced when small-gauge needles pierced the cap during two-handed recapping (*ASA Newsletter,* October 1992). A subsequent survey covering blood-borne exposures was distributed to 67 anesthesia residency training programs. From September 1992 through February 1993, 912 surveys were returned from 26.8% of residents in 51 residency programs. These data indicated that 456 residents (50% of all respondents) had experienced needlestick injuries from a small-gauge needle piercing the cap, and 122 (122/456, 27%) had injuries with contaminated small-gauge needles.

To determine why small-gauge needles (25- or 26-G) frequently penetrated the cap during recapping, a laboratory simulation was devised to compare the force required to cap two brands of small-gauge needles with that necessary to pierce the needle caps. A spring scale was modified with a Luer-lock adaptor, and a recorder was connected to measure the maximum force applied as a 25-G (Sherwood Medical) or 26-G needle (Becton Dickinson) was pushed into its cap. First, the force required to cap the needles was measured with the needles properly seated in the cap. These measurements were compared to measurements obtained when the needle pierced *the side of the cap.* The readings on the scale (ounces) were recorded for each trial, and the two measurements with each brand of needle were compared using a *t* test. (The measurement of ounces is directly related to the force applied to the needle.)

The mean "force" required to properly cap the 26-G needle was 41.5 ± 5.0 (mean $\pm$ SD) ounces ($n = 10$), which was not significantly different from that required to pierce the cap, 41.9 ± 2.0 ounces. Therefore, when a practitioner applied the appropriate force to properly recap the 26-G needle, it would be sufficient to pierce the cap.

Subsequent to the time of the resident survey, Becton Dickinson began manufacturing and distributing a cap with a different composition for their 26-G needles. When similar testing was performed on the newer version of the cap, it was found that the force required to pierce the cap was 66.7 ± 4.1 ounces ($n = 10$) whereas that necessary to appropriately seat the needle in the cap was 30.8 ± 1.3 ounces ($P < 0.0001$). The change in design had resulted in a needle cap that requires a greater force to pierce than to properly apply the more "puncture-resistant" needle cover. With similar testing of the 25-G needle the force required to pierce the cap, 34.6 ± 5.2 ounces ($n = 8$), was significantly greater ($P < 0.0001$) than that necessary to seat the needle in the cap, 17.1 ± 2.2 ounces.

Historically, needle caps or shields were intended only to maintain sterility of the needles during transport from the manufacturer and not a safety device to prevent needlestick injuries during multiple uses. The initial cap material permitted the 26-G needle to penetrate it at a force that did not differ from that used routinely for recapping. By requiring a greater force to pierce the cap, the new construction of the Becton Dickinson product should result in a decrease in needlestick injuries *via* this mechanism and is comparable to the cap on the Sherwood Medical 25-G needle.

The best approach for preventing needlestick injuries is to avoid

recapping used needles by hand.[2] If the clinical procedure necessitates recapping, alternative techniques are available to prevent two-handed recapping.[3]

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Anesthesiology
82:311–312, 1995

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(Accepted for publication October 3, 1994.)

Are Today's Epidurals the 12% Solution?

To the Editor:—Do labor epidurals given to nulliparous women contribute to an increased likelihood of cesarean delivery, reported as 25% in the obstetric literature?[1] A randomized, controlled trial has demonstrated that some kind of "epidural" increased the incidence of cesarean delivery, as triggered by fetal distress, "arrest of cervical dilatation in the active phase of labor," "arrest of descent," or dystocia.[1]

The anesthesia methods used for these patients treated between 1990 and 1992[1] are not those currently in use, and for that reason, the general conclusion of that study[1] is inapplicable to contemporary

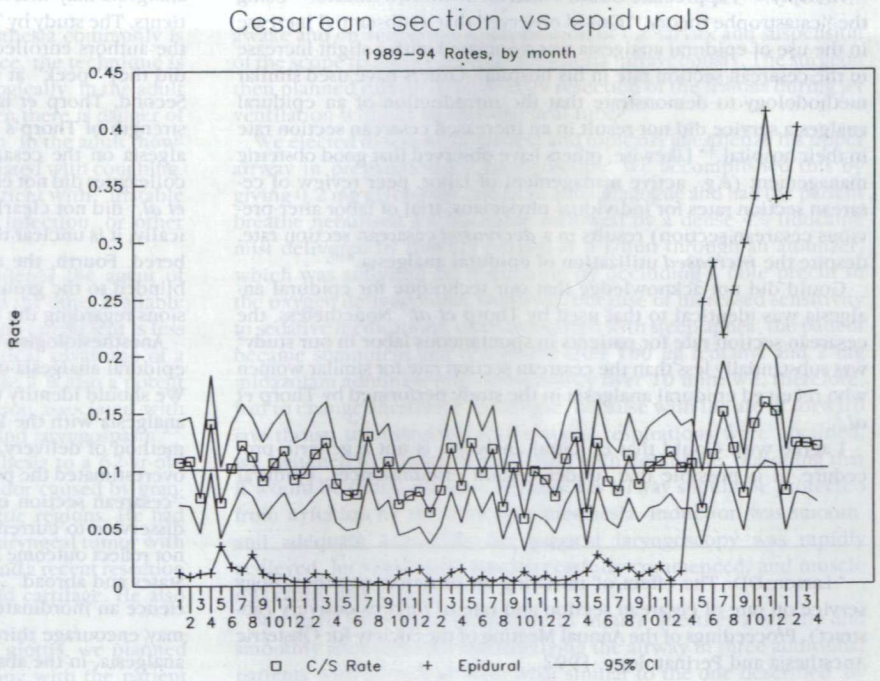

Fig. 1. Stable 10% cesarean section rate for 4 yr at St. Louis Regional Medical Center (squares) surrounded by 95% confidence intervals. Introduction of early labor epidural analgesia is associated with an average cesarean section rate of 12%. Use of labor epidurals (+) increased to about 45%.