TITLE: PATTERNS OF EPIDURAL STEROID USE BY ANESTHESIOLOGISTS IN ILLINOIS

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Epidural steroid injections for the treatment of pain of spinal origin have become a widespread practice. Although recommendations exist for such variables as dosage of steroid, frequency and rate of injection, only anecdotal information exists concerning the logistics of epidural steroid use by anesthesiologists. Recently, we mailed a questionnaire to the active members of the Illinois Society of Anesthesiologists to survey their patterns of epidural steroid use. 797 questionnaires were sent out and 224 (31%) were returned.

While 74 (33%) of the respondents do not perform epidural injections, 150 (67%) do. Of that number, 91% do lumbar injections, 40% thoracic, and 40% cervical. 28% do caudal and 7% do subarachnoid injections. The percentage of anesthesiologists in any given hospital who perform epidural injections varied from 91% in hospitals with 5 or fewer anesthesiologists to 46% in hospitals with over 20. Of physicians other than anesthesiologists reported to do epidural injections in hospital settings, neurosurgeons are the most common (16%).

The lateral position is used by 54% of those doing lumbar injections, 30% for thoracic, 23% for cervical, and 13% for caudal. The sitting position is used by 37% for lumbar, 65% for thoracic, and 68% for cervical. The prone position is used by 7% for cervical and 85% for caudal injections. 97% of anesthesiologists usually use a needle, while 3% usually use a catheter for injection.

68% do a single injection with repeat injections only if symptoms persist. 7% do a series of 2 injections, while 25% do a series of 3. 40% allow 1 week between injections; 43% wait 2 weeks, 9% wait 3; 4% wait 4; and 4% use some other regimen of intervals. 72% of the anesthesiologists perform fewer than 5 injections per week; 15% do 5-10; and 13% do more than 10. IV infusions are started by 34% for caudal, 34% for lumbar, 40% for thoracic, and 60% for cervical injections.

Methylprednisolone (M) suspension is used by 93% of anesthesiologists; 5% use triamcinolone suspension; while 2% use either another steroid or a combination of steroids. 63% use M in a dose of 80mgm or less; 30% use between 80 and 120mgm; and 7% use over 120mgm. 73% of anesthesiologists use a local anesthetic with the steroid, while 27% do not. 28% perform the injections in the operating room, 29% in the recovery room, 28% in a special pain clinic area, and 15% in other areas. 23 reported complications of which 11 were judged to be serious. These included 3 epidural abscesses, 1 perineal abscess, 1 epidural hematoma, 2 respiratory arrests, 1 total spinal, 1 GI bleed, 1 pneumoencephalopathy, and 1 cardiac arrest with death.

Thus, epidural steroid injections are frequently performed by many anesthesiologists. However, techniques, dosage schedules, monitoring, and locations vary considerably, indicating the need for more studies to establish optimal practices for this procedure.



**Title:** THE ROLE OF CONTINUOUS INFUSION IN SUPPLEMENTING ALFENTANIL PCA

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The aim of this study was to determine an appropriate PCA dose schedule for alfentanil. Previous studies have failed to establish the relative roles of bolus dose size and background infusion (BI) in providing optimal postoperative pain relief[1].

This study was approved by the FMC Committee on Clinical Investigation. Forty patients (ASA I or II) scheduled for major upper abdominal surgery gave informed consent to be randomly assigned to receive alfentanil i.v. PCA by (i) 200 mcg demand bolus; (ii) 300 mcg demand bolus; (iii) 100 mcg demand bolus plus 900 mcg/hr continuous infusion or (iv) 200 mcg demand bolus plus 900 mcg/hr continuous infusion; all with a 5 minute lockout. These doses were based on the results of a previous study[1]. Pain (10 cm visual analogue scale) and sedation (4 point categorical scale) scores were measured hourly while the patient was awake for 24 hr and time integrals (PAINAUC and SEDAUC, respectively) were calculated. Patients were withdrawn from the study if they received inadequate pain control (patient complained of pain at two consecutive observations times) or suffered respiratory depression (respiratory rate < 8/min).

Seven patients receiving boluses only (3 in the 200 mcg group, 4 in the 300 mcg group) and two receiving boluses plus infusion (one in each group) were withdrawn due to inadequate pain control ($0.1 > p > 0.05$, chi-square test). Three patients in the group receiving infusion (all in the 200 mcg group) but only one patient receiving boluses only (300 mcg group) were withdrawn due to respiratory depression.

Addition of a mandatory infusion to the demand boluses reduced the number of demands made but not in proportion to the amount of extra alfentanil received; patients in the infusion group received significantly more alfentanil than those receiving boluses only ($p < 0.01$, ANOVA) (Figure). Despite this, patients receiving BI did not have significantly lower PAINAUC or significantly higher SEDAUC.

Alfentanil PCA provided adequate pain relief in the majority of patients in this study. Most patients withdrawn due to inadequate pain relief were from the bolus-only groups, while respiratory depression occurred predominantly in patients receiving boluses plus BI; these correspond to groups receiving lower and higher doses of alfentanil, respectively. The provision of extra drug beyond that demanded by patients may shift the balance towards improved pain relief but at the cost of a need for increased monitoring.

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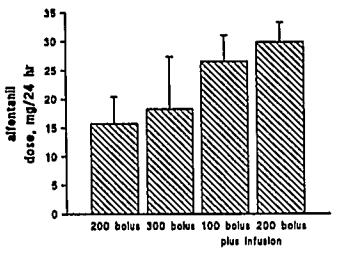
**Reference:** 1. *Anesthesiology* 71: A689, 1989.




Total alfentanil dose (mean ± S.D.)