Knee arthroscopy is usually performed as an outpatient procedure. It has been established that outpatient procedures are gaining in popularity because of the decreased expense and apparent equal effectiveness compared with the same procedures performed on an inpatient basis. Although general anesthesia often is used for this procedure, the search for increased efficiency and earlier discharge has led to consideration of alternative pain management techniques. Pain is the most common medical cause of delayed recovery and discharge after ambulatory surgery and a frequent cause of unplanned admission. Consequently, various techniques, such as intra-articular injection of morphine or bupivacaine, have been suggested. However, studies have shown no significant differences in postoperative pain scores between groups that did or did not receive these analgesics. Subarachnoid block and epidural anesthesia with local anesthetics and neuraxial narcotics are options, but the extent of the anesthetized area seems to be excessive for the rather small surgical trauma. The efficacy of local anesthesia for knee arthroscopy has been demonstrated. The placement of the local knee block benefits the patient by reducing the amount of narcotics administered intraoperatively and postoperatively. The local knee block is quickly placed, safe, efficacious, and cost-effective. Postoperatively, patients are observed to be wide awake and very comfortable, thereby expediting their return home.

Materials and methods
A retrospective study was performed with data obtained from our ambulatory surgery quality review program to assess the effectiveness of the local knee block in reducing postoperative pain. The study included 59 consecutive patients who were divided into 2 groups according to the anesthetic technique used. Group 1 (n = 15) received general anesthesia; group 2 (n = 44) received a local knee block with general or monitored anesthesia care (MAC) according to patient preference.

Measurements of serum lidocaine and bupivacaine levels after intra-articular injection demonstrate slow uptake from the knee joint with a slow increase in blood levels. However, the anesthesia practitioner should always be cognizant in adjusting the local anesthetic dose according to the patient’s weight and age when performing the knee block.

After premedication with intravenous (IV) midazolam, 1 to 4 mg, patients in group 1 were taken from the same-day services (SDS) unit to the operating room. Standard monitors (noninvasive blood pressure, electrocardiogram, and pulse oximetry) were applied. Standard monitors were applied to patients in group 2. After premedication with IV midazolam, 1 to 4 mg, patients received a local knee block when they were in SDS or the operating room, after induction of general anesthesia, according to patient choice.

In group 1, anesthesia was induced with IV propofol, 1.5 to 2.5 mg/kg, and fentanyl, 1 to 2 µg/kg. After induction, appropriate airway placement was performed. General anesthesia was maintained with desflurane or sevoflurane, with a mixture of oxygen and air in proportions to maintain an oxygen saturation of 98% or higher.

Patients assigned to group 2 received local knee block while they were in SDS, after sedation, or in the...
operating room after induction of general anesthesia. The local knee block was performed according to the following technique. The appropriate knee was shaved, scrubbed, and painted with povidone-iodine solution. Using aseptic technique, 0.25% bupivacaine totaling 20 mL was infiltrated anterolateral and anteromedial to the patellar ligament. Intra-articular injection was composed of 1% lidocaine with epinephrine, 1:200,000, 40 mL. Placement was accomplished using an 18-gauge needle placed via the superolateral aspect of the patella to avoid the fat pad. Patients who preferred MAC anesthesia were offered sedation, including IV midazolam in increments of 1 mg, propofol infusion of 25 to 50 µg/kg per minute, and fentanyl, 1 to 2 µg/kg. Patients who chose general anesthesia received IV propofol, 1.5 to 2.5 mg/kg, combined with fentanyl, 1 to 2 µg/kg. After induction, the appropriate airway was placed. Maintenance of anesthesia was achieved with desflurane or sevoflurane, and a mixture of oxygen and air in proportions to maintain an oxygen saturation of 98% or higher was used.

After surgery, patients who received general anesthesia were taken to the postanesthesia care unit (PACU). As soon as they were awake and oriented with sufficient pain control, the patients were transferred to SDS. Patients who received MAC were admitted directly to SDS if they were awake, oriented, and had an uneventful intraoperative course.

Demographic data are reported as percentages or as mean ± 1 SD. The Wilcoxon rank sum and \( \chi^2 \) tests were used to compare the dependent variables between groups. A \( P \) value of less than .05 was considered significant.

### Results

All patients underwent knee arthroscopy by 1 of 3 surgeons. A Certified Registered Nurse Anesthetist or an anesthesiologist provided general anesthesia in group 1 and local knee block with MAC or general anesthesia in group 2. Anesthesia providers experienced with local knee block performed the blocks using the same standardized approach as described previously. No significant differences were observed in age, sex, or site demographics between the 2 groups (Table). Women constituted the majority of the subjects (31/59 [53%]) with 7 in group 1 and 24 in group 2; 28 of 59 (47%) of the subjects were men, with 8 in group 1 and 20 in group 2. Surgical procedures included knee arthroscopy with partial meniscectomy, chondroplasty, synovectomy, or plica excision.

The verbal rating scale pain scores were significantly lower for group 2 than for group 1 in PACU and SDS and on the first postoperative day (\( P < .01 \); Figure 1). These differences were greatest in PACU (0 vs 4) and SDS (0.25 vs 3.7). The percentage of patients requiring supplemental pain medication is given in Figure 2. During the PACU period, none of the patients in group 2 received pain medication, whereas 47% (7/15) of patients in group 1 received pain medication. In SDS, 5% (2/44) of the patients received pain medication in group 2, as did 47% (7/15) of the patients in group 1 (\( P < .01 \)).

### Discussion

Two anesthesia techniques used for outpatient knee arthroscopy in our facility were reviewed. The local knee block resulted in significantly lower pain scores...
in PACU and SDS and during the first postoperative day. In addition, narcotic requirements were decreased in group 2 in PACU and SDS. The verbal rating scale was used to help patients describe their pain in subjective terms. It has been suggested that pain scores from 0 to 3 are indicative of sufficient analgesia. The mean pain scores in group 2 were within the sufficient-analgesia range in the PACU and SDS and during the first postoperative day. The scores in group 1 fell in the range of insufficient analgesia. This suggests that patients who receive a local knee block preoperatively with general or MAC anesthesia have significantly less discomfort, at least through the first postoperative day. Reduction in levels of pain results in decreased use of narcotic analgesics. This should translate into less nausea and vomiting, also improving discharge times and patient satisfaction. The results obtained from this retrospective analysis suggest the need for a prospective study.

**REFERENCES**


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