

**PD-13. THE DELIVERY RATE ACCURACY OF PORTABLE INFUSION PUMPS USED FOR CONTINUOUS REGIONAL ANALGESIA**

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Portable pumps used for local anesthetic infusion during continuous regional analgesia are gaining acceptance and usage. 1-7 These pumps are often used for ambulatory patients who are medically unsupervised for the majority of the infusion duration. However, the performance of these pumps infusing potentially toxic medication has not been independently investigated. We investigated the flow-rate accuracy, consistency, and profiles of various portable pumps often used for local anesthetic infusion during continuous regional analgesia. Using a computer/scale combination within a laboratory to record infusion rates, five pumps (see table) were tested with their flow-regulators at expected (30-32°C) and increased (34-36°C) temperatures. A sixth pump (Microject PCA) was tested at room temperature (20-24°C) as it is electronic and does not have a temperature-dependent flow-regulator. Each test was performed twice with a new infusion pump unit using normal saline, 0.9%, as the infusate. If the infusion rate during the second trial was found to differ more than ±10% of the original trial at any point, then a third trial was performed. The trials were combined to produce a mean profile for each pump at the baseline/expected temperature (hollow circles in figures). Following this, all pumps (except for the Microject) were tested again using the same protocol, but with the heating unit set 4°C above the baseline temperature (solid circles in figures). Infusion rate accuracy differed significantly among the pumps, exhibiting flow rates within ±15% of their set rate for 18-100% of their infusion duration (see figures). An increase in temperature also affected pumps to differing degrees, with infusion rates increasing from 0-25% for each model tested (see figures). These results suggest that factors such as flow-rate accuracy and consistency, infusion profile, and temperature sensitivity should be taken into consideration when choosing and utilizing a portable infusion pump for local anesthetic administration.

(1) *Anesth.Analg.* 1998; 86: 86-9. (2) *Anesthesiology* 1999; 91: 563-5. (3) *Ilfeld BM and Enneking FK. Reg Anesth Pain Med In Press.* 2002. (4) *Anesth Analg* 2000; 91: 1436-40. (5) *Anesth Analg* 2001; 93: 601-5. (6) *Arthroscopy* 2000; 16: 339-42. (7) *Can.J.Anaesth.* 2000; 47: 897-902.

Pump Name and Distributor		Reservoir Volume (mL.)	Set Infusion Rate (ml./hr)	Expected Duration (hr)	Energy Source
Accufuser	McKinley Medical	275	5.0	55.0	elastomeric
C-Bloc	I-Flow Corp.	270	5.0	54.0	elastomeric
MedFlo II	MPS Acacia	200	5.0	40.0	elastomeric
Microject PCA	Sorenson Medical	300	5.0	60.0	electronic
Pain Pump	Stryker Instruments	240	4.16	57.7	vacuum
Sgarlato	Sgarlato Labs	200	4.0	50.0	spring

