

# Regional nerve blockade for pediatric surgery: Summary of our experience at Children's Hospital Boston

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**Introduction:** Over the past few years there has been a renewed interest in the practice of regional anesthesia for the pediatric population. Several new techniques like ultrasound guidance have come into practice, and peripheral nerve blockade (PNB) for children which was once scarcely performed has now become more common. Overall, there is a scarcity of literature and reviews that discuss the practice of regional anesthesia in the pediatric population. We present our preliminary experience with safety and efficacy of PNB performed by anesthesia trainees rotating through a dedicated regional anesthesia program.

**Methods:** At our institution, we are developing a program to promote PNB for pediatric patients for perioperative pain control. Over the past 7 months, we recorded data on patient demographics, type of surgery and block performed, local anesthetic dose, block technique, and quality for our regional anesthetic cases. Patients were evaluated intraoperatively, in the PACU, and on the first post-operative day either by personal interview if admitted as an in-patient or via telephone interview if discharged home on the day of surgery. We retrospectively analyzed our electronic data for overall efficacy and safety profile in the pediatric population for PNB performed awake/sedated or under general anesthesia. We have also compared our ultrasound (US) guided blocks to those performed with nerve stimulator (NS) to assess differences in outcome.

**Results:** Over a period of 7 months, 245 PNB in patients ages 1-24 were done at Children's Hospital Boston excluding all neuraxial and caudal blocks. Of these 245 blocks, 210 were extremity blocks performed primarily for orthopedic procedures and 35 were superficial nerve blocks performed primarily for head and neck procedures. The most commonly performed PNB were femoral nerve block (22%), infraclavicular nerve block (17.5%), sciatic nerve block (14.7%), axillary nerve block (10.2%), fascia iliaca nerve block (6.5%), ankle block (4.9%), combined femoral/sciatic nerve block (4.5%), interscalene nerve block (2.8%), superficial cervical plexus block (7.3%), and infraorbital nerve block (6.5%). Infusions of local anesthetics via indwelling catheters were used in 8 patients; 3 infraclavicular, 1 supraclavicular, 3 lumbar plexus, and 1 sciatic nerve block. Of the 210 extremity blocks, 93 (43.3%) were performed solely with ultrasound guidance (US), 70 (33.3%) only with nerve stimulator (NS), 17 (8.0%) with nerve stimulation combined with ultrasound guidance, 2 (0.9%) under fluoroscopy, and 28 (13.3%) using anatomical landmarks/ fascial clicks. A satisfactory PNB was defined as one requiring no or minimal narcotics during the duration of the block. Analyzing the available data, 94% of patients getting an ultrasound guided block were satisfied while 6% had unsatisfactory blocks. For the blocks performed only using NS, 87% patients had satisfactory blocks, whereas for blocks performed using a combination of US and NS, only 82% of the patients had a satisfactory block. For the regional procedures, 43% were performed in patients who were awake/ sedated while 57% of them were performed in patients under general anesthesia. The blocks done under general anesthesia were not noted to have any higher number of complications as compared to those performed awake/sedated. Overall there were two incidences of postoperative neuropathy attributed to regional anesthesia (0.8%), both associated with pain on injection in awake/sedated patients undergoing femoral nerve blocks with NS. In both cases the neuropathy resolved spontaneously over the following months and was not

associated with any long-term sequelae. There were no reported serious complications like intravascular injections, cardiac arrests, seizures, or radiculopathy in either the NS or US groups.

**Discussion:** The development and progress of PNB in children has been slow for many reasons, particularly due to a potential risk of neural injury in anesthetized child. Only a few institutions offer formal pediatric regional anesthesia training. The goal of our program has been to encourage regional anesthesia in appropriate patients at our institution. The intent of a formal PNB program is to improve the quality, frequency, and consistency of regional anesthesia in children, as well as to conduct clinical trials. This report has given us an opportunity to review our learning curve and make efforts to improve our data collection for better research in the future. We are now offering PNB to our pediatric patients as an option to improve postoperative recovery and perioperative outcome, as are our surgeons who are now able to offer their patients an additional form of perioperative pain control.

### **References**

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