## Continuous Peripheral Nerve Blockade for Inpatient and Outpatient Postoperative Analgesia in Children

Arjunan Ganesh, MBBS\*†

John B. Rose, MD\*t

Lawrence Wells, MD11

Theodore Ganley, MD†‡

Harshad Gurnaney, MD<sup>e</sup>t

Lynne G. Maxwell, MD<sup>+</sup>t

Theresa DiMaggio, MSN\*

Karen Milovcich, MSN<sup>a</sup>

Mauseen Scollon, M5N\*

Jeffrey M. Feldman, MD\*t

Giovanni Cucchiaro, MD<sup>+</sup>t

BACKGROUND: This is an audit of the continuous peripheral nerve blockade (CTNB) program that was implemented at our institution to provide postoperative analgesia after orthopedic procedures in children.

MEMODS: We reviewed the departmental regional anesthesia registry and the medical records of consecutive children who received CPNB for postoperative analysis at The Children's Hospital of Philadelphia between February 2003 and July 2006. Patients were prospectively followed until cessation of the effects of CPNB and/or resolution of any related complications. Data collected contemporareously included presence of sensory and motor blockade, pain scores in inpatients, opioid administration, and comp lications related to CPNB.

RESULTS: A total of 226 peripheral nerve catheters were placed in 217 patients. One hundred eight patients (112 catheters) were discharged home with CPNB. The ages ranged from 4 to 18 yr (13.7  $\pm$  3.4). Local anesthetic solution (0.12% buptwacaine [n=164], 0.1% ropivacaine [n=12], or 0.15% ropivacaine [n=27]) was infused at an initial rate of 2–12 mL/h based on patients' weights and locations of catheters. The mean duration of local anesthetic infusion was 48.4  $\pm$  29.3 h (range 0–160 h). The percentage of patients who did not require any opioids in the first 8, 24, and 48 h after surgery was 56%, 26%, and 21%, respectively. The incidence of nausea and vomiting was 14% (13% in outpatients, 15% in impatients). Complications were noted in 2.8% of patients. Three patients had prolonged numbriess (>24 h) that resolved spontaneously; one developed superficial cellulitis that resolved with a course of antibiotics; one had difficulty removing the catheter at home and one developed timitus 24 h after starting CPNB that resolved quickly after clamping of the catheter followed by removal.

CONCLUSION: It is feasible to implement a CPNB program to provide an alternative method of inpatient and outpatient postoperative analgesia after orthopedic surgery in children when appropriate expertise is available. Patient and family education along with frequent follow-up are crucial to detect and address adverse events promptly.

(Amount Amag 2007; 509:1:2341-42)

Over the past few years, continuous peripheral nerve blockade (CPNB) for postoperative analgesia has emerged as a safe and effective technique in adults. Several prospective studies have demonstrated the benefits of CPNB after orthopedic surgery (1-4). The advantages include site-specific analgesia, fewer side effects when compared with other methods of

analgesia, early discharge from the hospital, and significant reduction in health care utilization and costs (5). However, complications such as nerve injury and infection have also been reported with CPNB, particularly after femoral perineural catheters (6).

There is a paucity of data in the medical literature regarding the feasibility, safety and efficacy of CPNB in a pediatric population. Only a few case reports and small patient series have been published describing the use of CPNB in children (7-11) during the postoperative period, and in the only report in which children were sent home with nerve catheters, the CPNB was used to manage complex regional pain syndrome (10). In January 2003, we implemented a program to provide CPNB for postoperative analgesia in children after a variety of surgeries, including day-surgery procedures. Data were collected prospectively and entered into a departmental regional anesthesia registry.

The purpose of this review of our database was to determine the feasibility of placing peripheral nerve catheters in children and to analyze the problems

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Conflict of Interest None.

Address correspondence and reprint requests to Adjanus Ganesh, MBBS, Department of Amesthesiology and Critical Case Medicine, The Children's Hospital of Philadelphia, 34th St. and Ciric Center Bbrd., Philadelphia, PA 19104–1399. Address e-mail to gameshadhensail.chop.edu.

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From the "Department of Anesthesia and Critical Care Medicine, The Children's Hospital of Philadelphia; tUniversity of Pennsylvania School of Medicine, and 2Department of Orthopedics, The Children's Hospital of Philadelphia, Philadelphia, Pennsylvania.

# **Conduction Blockade For Postoperative Analgesia**

J. A. W. Wildsmith, Edward N. Armitage, John H. McClure

#### **Conduction Blockade For Postoperative Analgesia:**

Conduction Blockade for Postoperative Analgesia J. H. McClure, J. A. W. Wildsmith, 1991-01-01 Bridging the gap between research and clinical treatment of pain this book indicates how drugs may be used to provide post operative analgesia at the level of the spinal cord or the peripheral nerve area It covers all aspects from the basic physiology of impulse transmission through the psychology of pain to the general principles of patient management used in clinical practice Bridenbaugh's Neural Blockade in Clinical Anesthesia and Pain Medicine Michael J. Cousins, 2012-03-29 This comprehensive authoritative text presents the scientific foundations and clinical practice of neural blockade in both regional anesthesia and the management of pain The descriptions and illustrations of pain mechanisms are considered classic examples The Fourth Edition has been refined for clarity and flows logically from principles and pharmacology to techniques for each anatomic region to applications This edition has two new co editors and several new chapters on topics including neurologic complications neural blockade for surgery treatment of pain in older people and complications in pain medicine A companion Website will offer the fully searchable text and an image bank Principles and Practice of Regional Anaesthesia Graeme McLeod, Colin McCartney, J. A. W. Wildsmith, Tony Wildsmith, 2013 The fourth edition of this highly successful textbook discusses the practical applications of the various methods of regional anaesthesia including ultrasound as well as giving an account of their theoretical aspects. The well established author team use their experience to provide a practical and stimulating book which reflects everyday clinical activity supplemented by high definition ultrasound images and schematic diagrams The book will also discuss the place of regional anaesthesia in current medical practice particularly with regard to pain processes ultrasound imaging and patient outcomes Regional anaesthesia is a rapidly expanding sub speciality of anaesthesia routine provision of long lasting pain relief and the introduction of real time ultrasound block has fuelled a demand for cadaver and ultrasound based anatomy training courses Thus it is more important than ever to have a thorough Clinical Skills in Treating the Foot Warren Turner, Linda M. Merriman, 2005-08-30 grounding in this exciting subspecialty The eagerly awaited new edition of Clinical Skills in Treating the Foot has been revised and updated with the needs of a broad range of health professionals in mind For anyone treating patients with foot disorders Clinical Skills in Treating the Foot will provide invaluable support through three key areas Section 1 is concerned with the general principles of managing foot disorders and the context in which treatment of the foot takes place Included are chapters on treatment planning evidence based practice governance and audit clinical protocols clinical emergencies and health promotion Section 2 examines the application of clinical therapeutics to foot disease and includes chapters on operative techniques surgery and the foot pharmacology physical therapy mechanical therapeutics chairside devices prescription devices and footwear therapy Section 3 considers the particular needs of special groups and includes chapters on the adult foot the child's foot sports injuries and management of tissue viability With its clarity of text and liberal use of case studies and illustrations the latest

edition of Clinical Skills will be required reading for practising and student podiatrists It will also be a valuable reference and quide for all others involved in the provision of treatment of the foot This book has been written as a companion volume to the editors Assessment of the Lower Limb also published by Elsevier Churchill Livingstone Written by an experienced team of clinicians who also understand the needs of students as well as practitioners Logical and clear structure makes it easy to use for both clinicians and students Each chapter is self contained and can be used for independent reading topics Case histories and clinical comment sections illustrate important clinical points Key points and summaries provides assistance for learning and review Features approximately 400 illustrations Half of the contributors are new more experienced clinicians than those used for the previous edition New chapter by new author on Clinical Governance replacing old chapter of Audit and Outcome Measurement Major revision by new authors of chapter on Treatment Planning to reflect new developments and changes in pracice Completely rewritten chapter by new authors on Clinical protocols Major revision by new author of the chapter on Foot health education and promotion Major rewrite with new author of the chapter on Pharmacology which will have expanded sections on topical and injected steroids and prescription medicines Major revision by new authors of the chapter on Physical therapy New section on chairside devices in the chapter on Mechanical therapeutics in the clinic new authors involved Chapter on Prescription orthoses now replaced with new chapter by new authors on Prescription devices Major rewrite by new author of the chapter on sports injuries New chapter on Managing tissue viability repaces the old chapter on the Management of foot ulcers and now incorporates the material previously covered in old appendices 1 and 2 on Management of exudation in ulcers and Footcare advice for people with diabetes Anaesthesia at the District Hospital Michael B. Dobson, 2000 This practical manual is designed to help medical officers in small hospitals provide safe and effective anesthesia for patients Intended for doctors with at least one year of postgraduate clinical experience it describes anesthetic techniques suitable for use in hospitals with limited resources Chapter 2 describes fundamental principles and techniques underlying the practice of anesthesia and outlines immediate and continuing care of critically ill or unconscious patients Chapter 3 focuses on continuing care of unconscious and anesthetized patients The focus of Chapter 4 is on the principles of fluid and electrolyte therapy Chapters 5 and 6 cover patient assessment before anesthesia and general anesthesia Chapter 7 concerns safe clinical use of anesthetic equipment best suited for and most likely found in district hospitals Chapter 8 contains examples of general anesthetic techniques feasible in small or medium sized hospitals Chapter 9 provides information on drugs Chapter 10 suggests techniques for conduction anesthesia Chapters 11 and 12 discuss choosing and planning the anesthetic technique and postoperative care of the patient Chapters 13 and 14 discuss special needs of pediatric and obstetric anaesthesia and important medical conditions Chapter 15 covers oxygen gas supplies equipment and maintenance Numerous illustrations convey technical details tables charts and checklists summarize lines of action and points to remember Checklists and an index are appended YLB Neural Blockade in Clinical Anesthesia

and Management of Pain Michael J. Cousins, Phillip O. Bridenbaugh, 1998 This unique text details the use of regional anesthesia for the management of all aspects of pain It demonstrates the various blocks used with lavish and classic illustrations to illuminate the text describing each procedure It also covers the latest aspects of pain management with recent advances and breakthroughs reported and discussed as to their relative usefulness and efficacy in clinical practice Classic contributions are balanced with reports of new technologic and research developments providing the best overview of regional anesthesia and pain management available today Evidence-Based Resource in Anaesthesia and Analaesia Martin Tramèr, 2008-04-15 This work discusses the methodology and available evidence from systematic reviews on the current best practice in anaesthesia and analgesia The first edition is built upon in this thoroughly revised and updated text Contributions are from acknowledged world authorities on systematic review in the specialty The free access website continues to provide added detail on the literature Surgical Care at the District Hospital World Health Organization, 2003-07-21 Many patients who present to district first referral level hospitals require surgical treatment for trauma obstetric abdominal or orthopedic emergencies Often surgery cannot be safely postponed to allow their transfer to a secondary or tertiary level hospital but many district hospitals in developing countries have no specialist surgical teams and are staffed by medical nursing and paramedical personnel who perform a wide range of surgical procedures often with inadequate training The quality of surgical and acute care is often further constrained by poor facilities inadequate low technology apparatus and limited supplies of drugs materials and other essentials The mission of the team responsible for Clinical Procedures in the World Health Organization Department of Essential Health Technologies EHT is to promote the quality of clinical care through the identification promotion and standardization of appropriate procedures equipment and materials particularly at district hospital level WHO BCT has identified education and training as a particular priority especially for non specialist practitioners who practice surgery and anesthesia It has therefore developed Surgical Care at the District Hospital as a practical resource for individual practitioners and for use in undergraduate and postgraduate programs in service training and continuing medical education programs The manual is a successor of three earlier publications that are widely used throughout the world and that remain important reference texts General Surgery at the District Hospital WHO 1988 Surgery at the District Hospital Obstetrics Gynecology Orthopedics and Traumatology WHO 1991 Anesthesia at the District Hospital WHO 1988 second edition 2000 This new manual draws together material from these three publications into a single volume which includes new and updated material as well as material from Managing Complications in Pregnancy and Childbirth A Guide for Midwives and Doctors WHO 2000 Veterinary Anesthesia and Analgesia Kurt A. Grimm, Leigh A. Lamont, William J. Tranquilli, Stephen A. Greene, Sheilah A. Robertson, 2015-05-11 Veterinary Anesthesia and Analgesia the Fifth Edition of Lumb and Jones is a reorganized and updated edition of the gold standard reference for anesthesia and pain management in veterinary patients Provides a thoroughly updated edition of this comprehensive reference on veterinary

anesthesia and analgesia combining state of the art scientific knowledge and clinically relevant information Covers immobilization sedation anesthesia and analgesia of companion wild zoo and laboratory animals Takes a body systems approach for easier reference to information about anesthetizing patients with existing conditions Adds 10 completely new chapters with in depth discussions of perioperative heat balance coagulation disorders pacemaker implantation cardiac output measurement cardiopulmonary bypass shelter anesthesia and pain management anesthetic risk assessment principles of anesthetic pharmacology and more Now printed in color with more than 400 images **Principles and Practice of** Regional Anaesthesia J. A. W. Wildsmith, Edward N. Armitage, John H. McClure, 2003 This book is aimed at anaesthetists in training and those studying for the FFARCS examination as well as at those senior anaesthetists whose training was completed before the revival of interest in regional anaesthesia Those already using regional techniques will find the book useful for extending and updating their knowledge Key features include clear views on often misunderstood subjects such as the pharmacokinetics and systemic toxicity of local anaesthetic drugs and the use of test doses a comprehensive chapter on the management of patients undergoing regional anaesthesia an assessment of the present place of spinal anaesthesia and an account of the features of some of the newer spinal agents Regional Nerve Blocks in Anesthesia and Pain Therapy Danilo Jankovic, Philip Peng, 2022-05-31 This comprehensive atlas which includes a wealth of illustrations and anatomic pictures created by the editors covers a broad range of both regional anesthesia and pain intervention techniques including neuromodulation The book is unique in that it covers ultrasound and fluoroscopic guided techniques as well as traditional landmark guided techniques The authors and editors are internationally renowned experts and share extensive theoretic and practical insights into regional anesthesia pain therapy and anatomic sciences for everyday practice. The book addresses the application of ultrasound and fluoroscopic guidance for pain interventions and provides detailed coverage of ultrasound guided and landmark guided regional anesthesia The book represents a detailed guide to the application of regional anesthesia and pain medicine furthermore examples of medico legal documentation are also included in this edition. The 5th edition of Regional Nerve Blocks in Anesthesia and Pain Medicine is practically oriented and provides essential guidelines for the clinical application of regional anesthesia It is intended for anesthesiologists and all professionals engaged in the field of pain therapy such as pain specialists surgeons orthopedists neurosurgeons neurologists general practitioners and nurse anesthetists Oxford Textbook of Anaesthesia for the Obese Patient Ashish Sinha, 2021 The Oxford Textbook of Anaesthesia for the Obese Patient is an evidence based account of clinical practice in the field Chapters are written by experts based in the US UK Europe and Australasia to reflect international practice Pediatric Anesthesia Bruno Bissonnette, 2011 No longer merely a subspecialty pediatric anesthesia is now a professional entity in its own right as is amply demonstrated in this comprehensive addition to the medical and surgical literature Pediatric Anesthesia Basic Principles State of the Art Future contains the contributions of 220 international experts from all five continents This is the

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