



Workshop: Advanced Ultrasound Guided Regional Anesthesia

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Disclosures

- No commercial interests to disclose
- This introduction may include Trade names of companies or products. This is not intended to be an endorsement, but merely a discussion of examples of available products.

Learning Objectives

- “Advanced Blocks”
- Indwelling Catheters
 - Evidence for use
 - Types of catheters

Advanced Blocks

- Spine and paravertebral
- Fascia-iliacus & Lateral Femoral Cutaneous (LFC)
- Abdominal Wall Blocks
 - Transversus Abdominus Plane (TAP)
 - Rectus Sheath
 - Ilioinguinal
 - Intercostal

Advanced Blocks

- Indwelling Catheters for
 - Femoral/Saphenous or Adductor Canal
 - Sciatic/Popliteal or Infragluteal
 - Brachial Plexus
 - Paravertebral
 - Abdominal Wall
 - Wherever there is a sensory nerve you can visualize?

Indwelling Peripheral Nerve Catheters

Evidence for Use

Acute Pain Summit 2005

“Use of Peripheral Analgesic Techniques Leads to Improved Patient Outcomes”

In cooperation with ASRA:

- 19 articles show higher patient satisfaction, lower total opioid consumption, reduced nausea and vomiting
- Quality of postoperative pain is (per patient report) directly correlated with quality of recovery
- Meta analysis of RCT's comparing systemic opiates and peripheral nerve blockade (continuous) evaluated
- Class 1a evidence

Rathmell et al. Regional Anesthesia and Pain Medicine Vol 31, No 4, Supplement 1. July-August 2006

Evidence for Use

Continuous Interscalene Block in Patients Having Outpatient Rotator Cuff Repair Surgery: A Prospective Randomized Trial

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Findings:

- “The analgesic benefits of CISB found in the PACU and immediately after discharge extend through the intermediate recovery period ending on postoperative day 7.”
- Highest pain numeric rating scale (worst pain score) was substantially lower in the continuous group (CISB) vs. the single shot (SISB) or GA only group
- Most patients in CISB and SISB were fast-tracked to discharge, no GA patient was
- Length of Stay in PACU (minutes):
 - CISB (20±31)
 - SISB (30±42)
 - GA (165±118)

Continuous Interscalene Brachial Plexus Block via an Ultrasound-Guided Posterior Approach: A Randomized, Triple-Masked, Placebo-Controlled Study

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BACKGROUND: The posterior approach for placing continuous interscalene catheters has not been studied in a controlled investigation. In this randomized, triple-masked, placebo-controlled study, we tested the hypothesis that an ultrasound-guided continuous posterior interscalene block provides superior postoperative analgesia compared to a single-injection ropivacaine interscalene block after moderately painful shoulder surgery.

METHODS: Preoperatively, subjects received a stimulating interscalene catheter using an ultrasound-guided, in-plane posterior approach. All subjects received an initial bolus of ropivacaine. Postoperatively, subjects were discharged with oral analgesics and a portable infusion device containing either ropivacaine 0.2% or normal saline programmed to deliver a perineural infusion over 2 days. The primary outcome was average pain on postoperative day (POD) 1 (scale 0–10). Secondary outcomes included least and worst pain scores, oral opioid requirements, sleep disturbances, patient satisfaction, and incidence of complications.

RESULTS: Of the 32 subjects enrolled, 30 perineural catheters were placed per protocol. Continuous ropivacaine perineural infusion ($n = 15$) produced a statistically and clinically significant reduction in average pain (median [10th–90th percentile]) on POD 1 compared with saline infusion ($n = 15$) after initial ropivacaine bolus (0.0 [0.0–3.0] versus 3.0 [0.0–6.0], respectively; $P < 0.001$). Median oral opioid consumption (morphine) was lower in the ropivacaine group than in the placebo group on POD 1 ($P = 0.002$) and POD 2 ($P = 0.002$). Subjects who received a ropivacaine infusion suffered fewer sleep disturbances than those in the placebo group ($P = 0.005$ on POD 0 and 1, night) and rated their satisfaction with analgesia higher than subjects who received normal saline ($P < 0.001$).

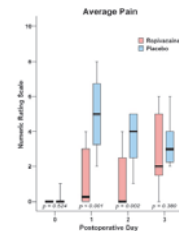
CONCLUSIONS: Compared to a single-injection interscalene block, a 2-day continuous posterior interscalene block provides greater pain relief, minimizes supplemental opioid requirements, greatly improves sleep quality, and increases patient satisfaction after moderate-to-severe painful outpatient shoulder surgery.

(Ann Surg 2009;250:1088–94)

Findings:

Compared to a Single Injection Interscalene Block, a 2-day continuous posterior interscalene block:

- Provides greater pain relief:



Findings:

Compared to a Single Injection Interscalene Block, a 2-day continuous posterior interscalene block:

- Reduces opioid consumption (67% in Continuous ropivacaine group received no opioids vs. 13% in placebo group)
- Improved sleep quality
- Increased patient satisfaction

Pediatric Ambulatory Perineural Catheters

Ambulatory Continuous Peripheral Nerve Blocks in Children and Adolescents: A Longitudinal 8-Year Single Center Study

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BACKGROUND: Although the role of regional anesthesia in pediatric patients has been increasing over the last few years, there are only a few small case series that describe the use of ambulatory continuous peripheral nerve blocks (CPNBs) in this patient population. In this report, we describe our experience with the use of ambulatory CPNBs in 1285 children.

METHODS: Data were collected for consecutive children who had a CPNB placed between January 2005 and December 2011 at The Children's Hospital of Philadelphia from the departmental regional anesthesia database. Data collected included demographics, the site of catheter placement and technique of nerve block, presence of sensory/motor blockade, use of perioperative opioids, and any complications related to CPNBs.

RESULTS: Continuous infusions of local anesthetics were administered via the catheters in 1285 outpatients. The mean duration of the CPNB was 90.7 ± 14.4 hours (mean \pm SD). Among patients discharged home with the CPNBs, 969 (75.4%) of the patients required either no supplemental opioids or oral opioids only on an "as needed" basis in the postoperative period (confidence interval, 73.0%–77.8%). Two patients were readmitted for IV pain management after they were discharged home with the CPNB catheters. No neurological deficit related to the CPNBs was identified in any of the patients at their 6-month follow-up with the orthopedic surgeon (confidence interval, 0%–0.29%).

CONCLUSION: This audit of 1285 children shows ambulatory CPNBs can provide postoperative analgesia and may reduce the need for inpatient parenteral opioid therapy. (Anesth Analg 2014;XXX:00–00)

Ultrasound-guided Continuous Median Nerve Block to Facilitate Intensive Hand Rehabilitation

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CLINICAL REPORT

Ultrasound-Guided Transversus Abdominis Plane Catheter for Chronic Abdominal Pain

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Paravertebral Blockade for Day-Case Breast Augmentation: A Randomized Clinical Trial

Sarah Gardiner, BMBS,* Glenda Rudkin, MBBS, FANZCA,† Rodney Cooter, MBBS, MD, FRACS,† John Field, PhD, AStat,§ and Malcolm Bond, PhD||

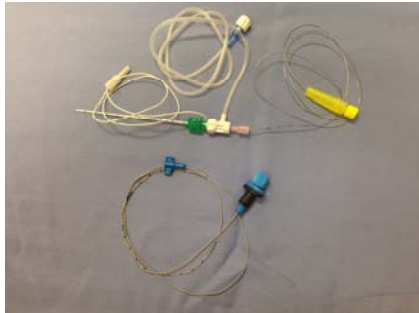
- Improved intra-operative cooperation as reported by surgeon
- Decreased requirements for intra-operative propofol
- Decreased post-operative pain in the home environment (no PVB patient required rescue analgesics)

Indwelling Peripheral Nerve Catheters

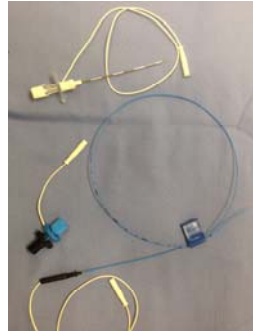
Types of Catheters

Stimulating vs. Non-Stimulating

Non-stimulating catheter



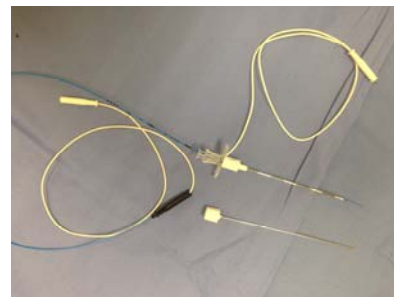
Stimulating Catheter



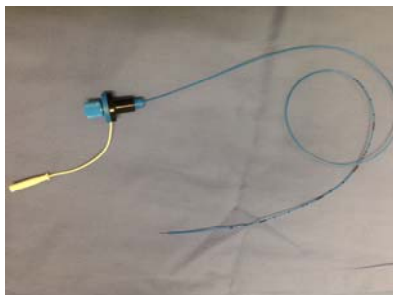
Stimulating Catheter



Stimulating Catheter



Stimulating Catheter

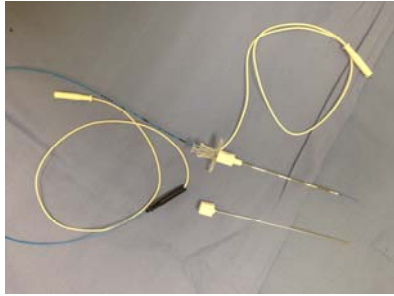


Indwelling Peripheral Nerve Catheters

Types of Catheters:

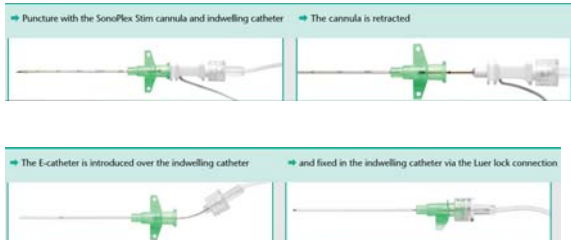
Through-the-Needle vs. Over-the-Needle

Through-the-needle catheter sets



Over-the-needle Catheter

Supposed Benefits:
One hand placement
Catheter threaded under ultrasound visualization
Less leakage at skin puncture site
No clamp-on adapter
Larger catheter more easily identified on ultrasound



My catheter is in....now what?



Infusion Pumps:
Disposable vs. Reusable



On-line Resources



neuraxiom.com
Ultrasound Guided Regional Nerve Blocks

