

FROM THEORY TO PRACTICE

STARTING REGIONAL ANESTHESIA PROGRAM IN YOUR HOSPITAL©

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Regional Anesthesia techniques that employ a single injection peripheral nerve block (SIPNB) or a continuous peripheral nerve block (CPNB) are becoming a standard in orthopedic surgery. Regional Anesthesia offers superior pain control, improved rehabilitation and most importantly, high patient satisfaction (1,8,9,15,21,22).

The benefits of Regional Anesthesia have been reported in the mainstream media as well (3,4,5,6). As a result, patients are beginning to expect a pain-free recovery. The pressure is now on the anesthesiologist to deliver the services that meet their patients' high expectations.

Regional Anesthesia was introduced to battlefield medicine in the Gulf Wars. The new techniques have successfully provided comfort to injured soldiers. (14). The advancements in techniques, improved patient safety and the successful results clearly demonstrate that Regional Anesthesia is the future of our practice.

Over the years, Regional Anesthesia has become easier to administer. Some of the original techniques described by Dr. Winnie have been modified to make them safer for the patient and simpler for the anesthesiologist (16,17,18,19,23,24). For example, the development of nerve stimulators, stimulating needles and ultrasound has allowed for a more precise identification of peripheral nerves (20).

This paper will provide you with some of the necessary resources to help you start a Regional Anesthesia Program in your hospital.

TRAINING IN REGIONAL ANESTHESIA

The key to reducing the risks and avoiding complications is hands-on training. The resources described below provide training in the latest techniques.

HANDS-ON CADAVER COURSES

The hands-on cadaver courses offer the best opportunity to learn applied anatomy and practice peripheral nerve blocks without a risk of injury to a patient. There are several hands-on cadaver courses offered every year.

1. Uniformed Services University of The Health Sciences, Bethesda, M.D. and Walter Reed Army Medical Center, Washington, D.C. "Comprehensive Regional Anesthesia Workshop". Registration Information: Gene Evans, program coordinator. (757) 496-5742 geneevans@erols.com
2. State University of New York at Buffalo. Buffalo, N.Y. "Comprehensive Regional Anesthesia Workshop". Registration information: Rose Berkun, MD, program coordinator. rbmd96@yahoo.com
3. New York State Society of Anesthesiologists, Post Graduate Assembly. New York City, N.Y. "Comprehensive Regional Anesthesia Hands-On Cadaver Workshop". www.nyssa-pga.org For more information contact Kurt Becker, Executive Director, (212) 867-7140 kurt@nyssa-pga.org

LIVE DEMONSTRATIONS

The University of Iowa offers a unique hands-on cadaver, volunteer and animal-based intensive workshop in Regional Anesthesia. Participants observe live demonstrations of peripheral nerve blocks and catheter placement on volunteers. Following the demonstrations participants practice nerve blocks on cadavers and anesthetized pigs.

University of Iowa. "RASCI Workshop – Regional Anesthesia Study Center of Iowa". Course director - André Boezaart, MD PhD. Register online: www.uianesthesia.com/rasci (319) 353-7239

DVD LECTURES

If traveling is not an option, there are several instructional DVDs that teach applied anatomy and provide step-by-step instruction. University of Iowa offers an instructional DVD created by Andre Boezaart, MD. It comes with RASCI course; however, the DVD can be ordered separately. (319) 353-7239. In addition, several manufacturers including LifeTech, Arrow and BBraun offer free DVD lectures.

OTHER RESOURCES

Experts in Regional Anesthesia can be contacted through organizations such as American Society for Regional Anesthesia (www.asra.com) and New York School for Regional Anesthesia (www.nysora.com).

Networking with fellow anesthesiologists who have established Regional Anesthesia programs in their institutions is helpful as well.

PERFORMING YOUR FIRST BLOCKS

Introducing Regional Anesthesia to surgeons that are unfamiliar with the newly developed techniques may be a challenge. The best way to start convincing surgeons of the benefits of Regional Anesthesia is by performing a specific peripheral nerve block, such as an interscalene block for a shoulder surgery. After establishing a successful track record, proceed to the next block and/or continuous infusion. If the surgeon and patients are happy with the results, the surgeon will recommend Regional Anesthesia to the colleagues and the interest among the surgeons will grow.

The keys to establishing a successful track record are as follows:

- Select an appropriate case
- Select one surgeon
- Start with the block you feel most comfortable performing
- Do not delay the surgery
- Graduate to more complicated or continuous nerve blocks
- Chart your progress
- Record your blocks for your personal edification
- Record your successes and complications
- Contact the experts and discuss your results

PATIENT EDUCATION

It is important that the patient fully understands the risks and benefits of the peripheral nerve block. The patient's family should also be educated on the procedure, its benefits and possible complications.

It is useful to have a brochure describing Regional Anesthesia in layman's terms. The brochure can be displayed at the surgeon's office, in pre-admission clinic and in the surgical waiting area. Prior to discharge, the patient should be given written instructions, including the signs of possible complications and a 24-hour contact number.

THE NECESSARY EQUIPMENT FOR REGIONAL ANESTHESIA

BLOCK ROOM

Ideally, a block room is the best location for Regional Anesthesia procedures. An alternative is Post Anesthesia Care Unit (PACU), where monitoring and emergency equipment is readily available. The ultrasound equipment should be kept in the same area as well.

BLOCK CART

A block cart will keep all the supplies and the equipment organized and at hand. A nerve stimulator is essential as well as several sizes of the stimulating needles. The stimulating needles come in a variety of gages, from 22 to 17 and in several lengths, 2" and up. Several companies, including LifeTech, BBraun and Arrow manufacture stimulating needles. Ask for samples before settling on the specific brand. Not all equipment is universal. Be sure that the nerve stimulator is compatible with the needles.

Other supplies to be included in the block cart are local anesthetics, syringes, needles, 4x4's, sterile skin prep, gowns, gloves, continuous block sets, sterile sheets, adhesive, etc.

SAFETY EQUIPMENT

The patient must be placed on standard monitors when the block is being performed. Blood pressure, ECG and a pulse oxymeter are essential. Oxygen is recommended if the patient is sedated. Rescue equipment, including a crash cart, manual resuscitation bag, several endotracheal tubes, laryngoscope, several blades and emergency drugs should be immediately available.

TAKING IT TO THE NEXT LEVEL: CONTINUOUS PERIPHERAL NERVE BLOCKS

A Continuous Peripheral Nerve Block allows the patient to remain free of surgical pain for several days after discharge from the hospital.

Ideally, a home care agency is directly involved in patient care when the patient leaves the hospital. A home care nurse visits the patient at home on the first and last day of therapy. The patient is monitored by telephone for the duration of the infusion. The nurse records the daily pain scores and the use of supplemental narcotics. The electronic infusion device records the infusion history, the total amount of local anesthetic used, how many times the bolus was requested and how many times the bolus was administered. The infusion history helps you adjust the infusion rates for future patients. The home care nurse returns to the patient's home at the end of infusion therapy, removes the catheter and documents the condition of the insertion site.

The revenue collected by the home care agencies for following CPNB patients is substantial. Therefore, they are interested in the infusion programs. To find such agency, first see if your hospital is affiliated with a home care agency. Then, contact local and nationwide agencies.

American Homepatient is a national chain that may have affiliates in your area. 1-800-332-0666, 716-681-2242.

Some anesthesia providers do not have a home care agency involved. In that case, the anesthesiologist needs to call the patient daily and provide detailed instructions on catheter removal.

An electronic low cost infusion device is ideal for continuous peripheral nerve infusion. It minimizes the need to return the device and mitigates the problem of losing it in the process. An electronic infusion pump, classified as a DME, can come at no cost to the hospital or the provider.

When choosing a device, consider the following criteria. The infusion pump should

- accommodate a large volume of anesthetic without refills to decrease the likelihood of infection
- be programmable to adjust the infusion rate and bolus dosage as needed
- have a continuous infusion as well as a bolus function
- have a pause/stop function

- provide a history at the end of therapy for documentation
- most importantly, be simple and easy to use

Decide whether the hospital pharmacy or the outside pharmacy will provide the local anesthetic infusion. You should prepare standard orders for postoperative local anesthetic infusion.

The nursing staff needs to be in-serviced on Regional Anesthesia. An anesthesiologist needs to explain how the blocks work, the benefits and the complications. The infusion device representative should in-service the nursing staff on the use of the pump. It is also helpful to have written guidelines for the nurses to follow.

It is important to provide written discharge instructions for patients to take home. They should include all the signs related to possible complications, the type of home care follow-up, such as a nursing visit at home or a call from an anesthesiologist and whether the nurse will remove the catheter or the patient will be responsible. If the patient will be removing the catheter at home, detailed instructions on catheter removal should be provided.

HOW TO CONVINCE YOUR HOSPITAL TO START A REGIONAL ANESTHESIA PROGRAM

The Hospital Administration's primary goal is increasing profit and raising the marketability of the institution. A Regional Anesthesia program appeals directly to the Administration's interests.

The likelihood of success in starting this program is directly related to your research and preparation. There are several issues that need to be resolved prior to approaching the administration, such as home patient care, medical equipment, pharmacy involvement, proper discharge instructions, nursing education and the costs involved in setting up the program.

You should research these issues and have all the answers before the questions are asked. The Hospital Administration will respond well to a carefully prepared plan that provides details of the program, cost, billing, reimbursement, and timetable for the program.

INCREASED PROFITS

The reduction in hospitalization is directly related to postoperative length of stay. Patients will be discharged home the same day, rather than remain in the hospital for 23 hours for pain control. The length of stay for ambulatory patients will decrease. Many will be able to bypass PACU and be admitted directly to phase II recovery. Decreased recovery time and increased turnover rate will improve the overall cost effectiveness.

INCREASED MARKETABILITY

The hospital will benefit from the Regional Anesthesia program by marketing of hospital's innovation. Patients and surgeons alike will refer other patients to the hospital because of the significant pain reduction experienced by patients post surgery, increasing the number of cases.

The JACHO has recently recommended that pain be treated as the "fifth" vital sign. Your hospital can meet and exceed this goal by implementing Regional Anesthesia techniques. The overall hospital rating and reputation will improve. The facility can become a center for excellence.

The hospital can be promoted as the center for Regional Anesthesia and Postoperative Pain Management. Local newspapers and television news programs will be interested in the story on painless surgery. This will raise the public awareness of the facility. Overall marketing ability and the referral rate for the surgeons and the hospital will improve.

Ultimately, the cost for a Regional Anesthesia Program is minimal and the benefits are great.

PATIENT BENEFITS (7,8,9,10,11,12)

- Superior pain control
- Dramatic reduction in intraoperative and postoperative narcotic use
- Decreased stress response to surgery (elevated catecholamine levels, hypercoagulability, systemic and coronary vasoconstriction, metabolic shifts to catabolic, protein-wasting state and immunosuppression)
- Decreased nausea and vomiting
- Faster discharge time
- Elimination of a 23 hour stay
- Immediate participation in rehabilitation therapy

- Improved recovery
- Improved rehabilitation
- Increased patient satisfaction
- Decreased incidence of Complex Regional Pain Syndrome (CREPS) after surgery

HOSPITAL BENEFITS (18)

- Decreased recovery time
- Decreased need for post-surgical nursing care
- Increased profitability due to increased turnover rate
- Increased overall hospital standing and reputation
- Marketing of hospital's innovation
- Increased ability to meet JCHAO standards and goals

REFERENCES

1. Ilfeld, BM: Ambulatory perineural infusion: The patient's perspective. *Reg Anesth Pain Med* 2003; 28:418-23
2. Klein, SM, Buckenmaier, CC: Ambulatory surgery with long acting regional anesthesia. *Minerva Anesthesiol* 2002; 68:1-9
3. Silverman, S: The painful truth: A revolution in battlefield medicine is helping conquer the pain. *Wired* 2005; 112-23
4. Gross, T: Army Doctor Pioneers Pain-Relief Work. Fresh Air from WHYY; April 27, 2005
5. Franczyk, AM: Technique kills surgical pain. *Business first* Feb 2005; 21/26:1,41
6. Pelligrino, L: Managing your pain. *AM Buffalo, WKBW TV, Buffalo, NY*; June 27, 2005
7. Ilfeld, BM: Popliteal sciatic perineural local anesthetic infusion. *Anesthesiology* 2004; 101:970-7
8. Ilfeld, BM: Continuous popliteal sciatic nerve block for postoperative pain control at home: A double blinded, placebo controlled study. *Anesthesiology* 2002; 97:959-65
9. White, PF: The use of continuous popliteal sciatic nerve block after surgery involving foot and ankle: Does it improve the quality of recovery? *Anesth Analg* 2003; 97:1303-9
10. Singelyn, FJ: Continuous popliteal sciatic nerve block: An original technique to provide postoperative analgesia after foot surgery. *Anesth Analg* 1997; 84:383-6
11. Gottschalk, A: Severing the link between acute and chronic pain: The anesthesiologist's role in preventive medicine. *Anesthesiology* 2004; 101:1063-5
12. Warltier, DC: Preventing the development of complex regional pain syndrome after surgery. *Anesthesiology* 2004; 101:1215-24
13. Grant, SA: Continuous peripheral nerve block for ambulatory surgery. *Reg Anesth Pain Med* 2001; 26:209-14
14. Buckenmaier, CC: Continuous peripheral nerve block for battlefield anesthesia and evacuation. *Reg Anesth Pain Med* 2005; 30:202-5
15. Chelly: Continuous femoral blocks improve recovery and outcome of patients undergoing total knee arthroplasty. *The Journal of Arthroplasty* 2001; 16:436-45
16. Franco, CD: The subclavian perivascular block. *Reg Anesth Pain Med* 1999; 3/4: 212-16
17. Franco, CD: Supraclavicular block in the obese population: an analysis of 2020 blocks. *Anesth Analg* 2006; 102:1252-4

18. Boezaart, AP: How I do it: Cervical paravertebral block. ASRA newsletter Nov 2005; 10-11
19. Rettig, HC: A comparison of the lateral and posterior approach for brachial plexus block. Reg Anesth Pain Med 2006; Vol 31, No 2:119-126
20. Rosenquist, RW: Brachial plexus block with a peripheral nerve stimulator. Reg Anesth Pain Med 1999; 3/4:227-29
21. Ilfeld, BM: Joint range of motion after total shoulder arthroplasty with and without a continuous interscalene nerve block: a retrospective, case-control study. Reg Anesth Pain Med 2005; Vol 30, No 5: 429-433
22. Gebhard, RE: Pain after discharge from ambulatory surgery-orthopedic patients benefit from peripheral nerve blocks. Anesthesiology 2002; 96:A25
23. Boezaart, AP: Paravertebral approach to the brachial plexus: An anatomic improvement in technique. Reg Anesth Pain Med 2003; 28:241-244
24. Carlo, DF: A subgluteal approach to the sciatic nerve in adults at 10 cm from the midline. Reg Anesth Pain Med 2006; Vol 31, No 3: 215-220

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