Regional Anesthesia and Acute Pain Medicine Fellowship at Wake Forest University

Fellowship Director: J. Douglas Jaffe, DO Assistant Professor and Member -

Section of Regional Anesthesia & Acute Pain Management Department of Anesthesiology, Wake Forest School of Medicine

Mission Statement:

(RAAPM)

The purpose of the fellowship in regional anesthesia at Wake Forest University is to educate qualified individuals whose clinical interests are commensurate with and who are committed to learning, enhancing, and promoting the specialty of regional anesthesia and acute pain management. A fellow will also become an expert educator of trainees in the subspecialty of regional anesthesia and acute pain management. This will differentiate a consultant in anesthesiology from an expert in the subspecialty of regional anesthesiology and acute pain medicine.

Research activities, the development of educational methods, and advanced patient management will be emphasized to achieve this Mission.

The fellowship is also designed to enhance the clinical experience of Wake Forest University residents in regional anesthesia and to contribute to the ongoing development of the specialty of regional anesthesia at Wake Forest University.

Eligible Applicants

The ideal candidate for the fellowship will have a strong clinical base in regional anesthesia and a professional commitment to building skills and competency suitable for the development of a regional anesthesia program at an academic institution. Excellent Interpersonal communication skills, professionalism, humanism, and a strong work ethic set apart the ideal candidate.

Fellowship Training in Regional Anesthesia at Wake Forest University:

Outline:
I. Scope of Training
II. Duration of Training
III. Institutional Organization
IV. Program Director and Faculty
V. Facilities and Resources
VI. Competency-Based Goals and Objectives
VII. Evaluation and Advising

I. Scope of Training:

The Fellow is expected to become familiar with the most recent version of the RAPM guidelines for Regional Anesthesia and Acute Pain. Reg Anesth Pain Med. 2011 May-Jun;36(3):282-8.

Textbook resources are available in the RAAPM library, the Carpenter Library on campus, and on the library's website for reference.

Regional anesthesia fellowship training is concentrated on the perioperative management of patients receiving neuraxial or peripheral neural blockade for anesthesia or analgesia. The program is designed to develop a base of expertise in the practice and theory of regional anesthesia, the organization of a consultant service, and the acquisition of operating room management skills as they relate to regional anesthesia. In addition, the fellow is expected to enhance teaching abilities and comprehension and incorporate practice guidelines and research based clinical decision making into his or her practice.

Acute Pain Management is inherently involved with regional anesthesia in the perioperative arena. Fellows will acquire expertise in management of patients with acute pain of both surgical and non-surgical etiologies. Independent decision making and management of a patient census while educating residents affords the fellow the opportunity to formalize his or her skills as an expert.

II. Duration of Training

Fellowship training is twelve months.

III. Institutional Organization:

A) The fellow functions in close relationship with our ACGME-accredited residency in anesthesiology, which includes specific rotations in regional anesthesia and acute pain management for the residents.

B) There is no ACGME designation or certification for regional anesthesia fellowships to date, but the fellowship is recognized by the Wake Forest University Office of Graduate Medical Education.

C) The fellowship stipend is to be supported in part by the fellow's activity as a junior faculty anesthesiologist, one day per week, in the inpatient operating room at Wake Forest Baptist Hospital.

IV. Program Director and Faculty:

A) The Director of the fellowship training program is a Board-Certified anesthesiologist who has completed a fellowship in regional anesthesia.

B) All faculty are Board-Certified or in the examination system in Anesthesiology. The number of faculty supervising fellowship training in regional anesthesia is five to seven.

V. Resources:

A dedicated area adjacent to the operating rooms and specific to the provision of regional anesthesia techniques is provided for the education of residents and fellows. This area provides all the necessary elements as listed below for such education:

1. **Separate patient care beds with full monitoring facilities and computerized electronic record keeping.**
2. **Dedicated ultrasound and other nerve localization equipment for the provision of regional anesthesia and analgesia techniques.**
3. **Equipment necessary for the performance of current regional anesthesia techniques including neuraxial and peripheral nerve block and catheter supplies.**
4. **Dedicated nurses responsible for the pre-procedure preparation of patients planned to undergo regional anesthesia and analgesia techniques, intra-procedure assistance, and post procedure care of patients receiving regional anesthesia and analgesia.**
5. **Access to the patient electronic medical record system for laboratory data, progress notes and consultations, and computerized order entry and procedure data collection.**
6. **A library dedicated to anesthesiology with literature specific to the practice of regional anesthesia is also maintained by the department.**
7. **The provision of regional anesthesia and analgesia techniques outside of the section where appropriate for patient care under the supervision of properly trained faculty.**
8. **Conference area for educational activities and the use of regional anesthesia teaching material and models.**

VI. Competency-Based Goals and Objectives

Program Goals:

Over the course of the 12-month fellowship, the fellow will enhance his or her cognitive, psychomotor, and affective skills to safely and effectively administer and teach regional anesthesia as a consultant in anesthesiology. The fellow will be responsible for decisions related to patient selection and technique application to facilitate efficient operating room throughput; safe, effective, cost prudent patient care; and enhanced patient recovery. The fellow will be expected to develop the skills needed to establish a regional anesthesia and acute pain management practice as a primary component of his or her future practice in anesthesiology.

A) Medical Knowledge
Upon completion of the program, the fellow will be able to:

1. Match specific patient and surgical procedure requirements to an appropriate regional anesthesia selection using sound clinical judgment. Debate the advantages/disadvantages of regional vs. general anesthesia for various procedures and patients in regard to patient recovery, patient outcome, operating room efficiency, and cost of care.
2. Use evidence-based medicine to select local anesthetics and adjuncts for neural blockade.
3. Local Anesthetics
   A. Understand and explain the pharmacokinetics of local anesthetics: absorption, distribution, metabolism, and excretion.
   B. Understand and explain and mechanism of action of local anesthetics.
   C. Understand and explain structure of amino-amides and amino-esters.
   D. Understand and explain of minimum effective concentration of local anesthetic (Cm.)
   E. Understand and explain effective concentrations, toxic dosage, influence of site of injection, and vasoconstrictor use in regard to clinical practice.
   F. Compare attributes of various local anesthetics: motor vs. sensory blocking discrimination and relative toxicity.
   G. Understand and explain lipid solubility, protein binding, pKa and their influence on onset, potency, and duration of block.
   H. Describe signs, symptoms, and treatment of local anesthetic toxicity
4. Make sound clinical decisions regarding the administration of systemic and neuraxial opioids, NSAIDs, and other non-opioid adjuncts for analgesia.
5. Skillfully and efficiently describe and perform a wide variety of modern regional anesthesia techniques including single-shot and continuous peripheral nerve block, spinal and combined spinal- epidural anesthesia, thoracic epidural, and nerve stimulator- and ultrasound-guided approaches (See detailed list below).

Spinal Anesthesia

1. Understand and explain the cardiovascular and pulmonary physiologic effects of spinal anesthesia.
2. Understand and explain local anesthetics for intrathecal use: agents, dosage, surgical, and total duration of action, as well as adjuvants commonly employed in neuraxial techniques.
3. Describe baricity of spinal local anesthetic solutions and how to espouse its influence on block level for a variety of surgical procedures.
4. Describe the indications and contraindications for spinal anesthesia.
5. Understand and explain side effects of agents and complications and management of inadequate anesthesia, hypotension, and ventilatory insufficiency.
6. Define post-dural puncture headache and describe symptoms, etiology, natural history of the disorder, and risk factors and management strategies.

7. Understand and explain the use of spinal anesthesia in an ambulatory surgery setting.
8. Explain the relative importance of factors affecting intensity, extent, and duration of block such as dose, volume, and baricity of injectate.
9. Describe differential blockade during neuraxial blockade.
10. Describe advantages and disadvantages of continuous spinal anesthesia.

Epidural Anesthesia (Lumbar, Thoracic, Caudal)

1. Understand and explain the physiology of epidural anesthesia.
2. Describe the contents of the epidural space.
3. Understand and explain the local anesthetics available for epidural use: agents, dosage, adjuncts, and duration of action.
4. Differentiate between spinal and epidural anesthesia with regard to reliability, latency, duration, and segmental limitations.
5. Describe the indications and contraindications for epidural anesthesia.
6. Understand and explain side effects, complications and management of inadequate anesthesia, hypotension, total spinal, accidental dural puncture, systemic toxicity, and the use of appropriate test dosing to minimize some of these complications.
7. Describe the volume-segment relationship and the effect of patient age, pregnancy, position, and site of injection on resultant block.
8. Understand and explain combined spinal-epidural anesthesia as distinguished from lumbar epidural anesthesia, including advantages/disadvantages, dose requirements, complications, indications and contraindications. Understand and explain caudal epidural and thoracic epidural anesthesia as distinguished from lumbar epidural anesthesia, including advantages/disadvantages, dose requirements, complications, indications and contraindications.

Nerve Localization Techniques

1. Understand principles, operation, advantages, and limitations of peripheral nerve stimulation to identify and anesthetize peripheral nerves.
2. Understand principles, operation, advantages, and limitations of ultrasound to identify and anesthetize peripheral nerves.

   Subcategories of knowledge in ultrasound include:

   1. Applied anatomical principles to nerve block procedures
   2. Physics and technical aspects of image generation
   3. Machine controls for image optimization
   4. Transducer manipulation for image optimization
   5. Sonoanatomic appearance of nerves and other tissues
   6. Needle guidance approaches
   7. Injectate appearance and optimization

Upper Extremity Nerve Block

1. Describe the anatomy of the brachial plexus in relation to sensory and motor innervation.
2. Understand and explain local anesthetics for brachial plexus block: agents, dosage, duration of action, and adjuvants.
3. Understand and explain side effects, complications, and management: inadequate anesthesia, systemic toxicity, blockade of adjacent neural structures (phrenic, sympathetic chain and neuraxis), neuropathy, neuropraxia.
4. Describe the various approaches to brachial plexus blockade, along with the indications/contraindications, advantages/disadvantages, and complications specific to each.
5. Describe peripheral nerve block in the upper extremity of the median, ulnar and radial nerves, with indications, contraindications, and complications.
6. Understand and explain the use and advantages/disadvantages of nerve localizing techniques including transarterial, perivascular, nerve stimulator, and paresthesia-seeking techniques.
7. Understand and explain the use and advantages/disadvantages specific to continuous brachial plexus anesthesia and analgesia.
8. Describe clinical implications of each individual nerve or plexus blockade specific to surgical procedure types, implications for intraoperative care, and postoperative recovery needs and how these differ from the patient undergoing similar procedures without regional techniques.

Lower Extremity Nerve Block

1. Describe anatomy of the lower extremity: sciatic, femoral, lateral femoral cutaneous, obturator nerves in relation to sensory and motor innervation.
2. Understand and explain local anesthetics for lower extremity block: agents, dosage, duration of action, and adjuvants.
3. Describe the various approaches to lower extremity blockade, along with the indications/contraindications, advantages/disadvantages, and complications specific to each.
4. Understand and explain side effects, complications, and management of lower extremity blockade: inadequate analgesia, systemic toxicity, blockade of adjacent neural structures, and post-operative neuropathy.
5. Differentiate individual blockade of the femoral, lateral femoral cutaneous, and obturator nerves from the anterior and posterior approaches to the lumbar plexus.
6. Differentiate individual blockade of the tibial and peroneal nerves from the classic and popliteal approaches to the sciatic nerve.
7. Describe clinical implications of each individual nerve or plexus blockade specific to surgical procedure types, implications for intraoperative care, and postoperative recovery needs and how these differ from the patient undergoing similar procedures without regional techniques.

Truncal Blockade

1. Understand and explain the anatomy of intercostal, paravertebral, rectus sheath, quadratus lumborum, ilioinguinal/iliohypogastric, pectoralis, serratus, and transversus abdominus plane (TAP) blockade.
2. Understand and explain local anesthetics for truncal blockade: agents, dosage, and duration of action.
3. Understand and explain the indications and contraindications for truncal blockade.
4. Understand and explain the side effects, complications, and management: inadequate anesthesia, systemic toxicity, and pneumothorax.
5. Describe clinical implications of each individual nerve or plexus blockade specific to surgical procedure types, implications for intraoperative care, and postoperative recovery needs and how these differ from the patient undergoing similar procedures without regional techniques.

Intravenous Regional Anesthesia (IVRA)

1. Understand and explain the mechanism of action of IVRA.
2. Understand and explain agents for IVRA: local anesthetic choice, dosage, and use of adjuvants.
3. Describe the indications and contraindications, advantages and disadvantages of IVRA.
4. Understand and explain the complications and management: systemic toxicity, inadequate anesthesia, and phlebitis.

Neuraxial Opioids

1. Understand and explain available drugs, effective dose, and duration of action.
2. Understand and explain the incidence of complications and side effects, monitoring, prevention, and therapy.
3. Describe the indications/contraindications for the use of neuraxial narcotics for acute pain management.
4. Describe the mechanism of action of neuraxial narcotics.
5. Differentiate intrathecal vs. epidural administration relative to dose, effect and side effects and how hydrophilic and hydrophobic drug pharmacokinetics differ.

Systemic Opioids

1. Understand and explain the pharmacokinetics of opioid analgesics: bioavailability, absorption, distribution, metabolism, and excretion.
2. Understand and explain the site and mechanism of action of opioids
3. Understand and explain the differences of chemical structure of the various opioids.
4. Describe challenges of post-procedure analgesic management in the patient with chronic pain and/or opioid tolerance

Non-Opioid Adjuncts

1. Describe the concept of multimodal analgesia and its impact on functional restoration after surgery.
2. Understand and explain the pharmacology of acetaminophen, NSAIDs, COX-2 inhibitors, NMDA antagonists, alpha-2 agonists, and gabapentinoid agents with respect to optimizing postoperative analgesia.

B) Patient Care

Upon completion of the program, the fellow should be able to:

1. Demonstrate rational selection of regional anesthesia for specific clinical situations.
2. Recognize and intervene to manage inadequate regional anesthetic techniques with supplemental blockade or alternate anesthetic approaches.
3. Properly prepare to manage rare but serious complications of regional anesthesia including local anesthetic toxicity and total spinal anesthesia.
4. Follow up on as many block patients as possible to assess outcomes of regional anesthesia and analgesia procedures. This includes evaluating patients immediately post-block, post-surgery, and POD #1.
5. Properly perform and teach correct technique for many of the following listed regional blocks to achieve a high success and low complication rate.
    a. The demonstration of capabilities in the education of junior learners is part of what is felt to distinguish a clinician expert.

1) Basic Techniques and Approaches:

• Superficial cervical plexus block
• Axillary brachial plexus block
• Intercostobrachial nerve block
• Wrist Block
• Intravenous regional anesthesia (Bier block)
• Saphenous nerve block
• Ankle block
• Spinal anesthesia
• Lumbar epidural anesthesia
• Combined spinal-epidural anesthesia
• Femoral nerve block

2) Intermediate Techniques and Approaches:

• Deep cervical plexus block
• Interscalene block
• Supraclavicular block
• Infraclavicular block
• Pectoralis 1 and 2 blocks

• Sciatic nerve block: posterior approaches
• Lumbar plexus block
• Popliteal block
• Suprascapular nerve block
• Intercostal nerve block
• Thoracic epidural anesthesia

3) Advanced Techniques and Approaches:

• Continuous interscalene block
• Continuous infraclavicular block
• Continuous axillary block
• Thoraco-lumbar paravertebral block: single or continuous
• Continuous femoral nerve block
• Obturator nerve block
• Continuous sciatic nerve block
• Continuous popliteal block: all approaches

4) Acute pain rounds

With attending faculty supervision, demonstrate management of patients at the level of a consultant whose diagnoses require consultation of the Acute Pain Management Service. Tasks will include the administration and coordination of multi-modal analgesic regimens to include such techniques as neuraxial and peripheral nerve catheters, local anesthetic and narcotic infusions, and non-narcotic analgesic adjuvants. The fellow as a consultant will understand and consider the indications, contraindications, side effects, potential complications, and daily management implications of these therapies.

C) Scholarly Activities / Practice-Based Learning
Upon completion of the program, the fellow should:

1. Participate in clinical research as a major activity of the year-long fellowship.
2. Where applicable, publish or participate in the publishing of up to two clinical studies during the year.
3. Expect to guest review manuscripts for the faculty who serve as editors of peer-reviewed journals to gain knowledge of manuscript preparation, when possible.
4. To accomplish these objectives, the RAAPM faculty will be committed to mentoring the fellow in the production of research, co-author papers as appropriate, and preparation of clinical research proposals with IRB approval prior to the start of the fellowship year, when possible.

D) Teaching Activities:

1. Present once during the second half of the fellowship year at Anesthesia Grand Rounds covering a topic or case relevant to regional anesthesia.

2. Prepare resident education lectures or journal reviews for the regional anesthesia subspecialty conference.
3. Participate in and direct portions of the fresh cadaver anatomy labs organized for anesthesia residents as part of their annual curriculum.
4. Participate in the Annual American Society of Regional Anesthesia and Pain Medicine Meeting with poster, lecture, or problem-based learning presentations where possible.
5. Solidify teaching techniques by instructing residents at the bedside in the Regional Anesthesia Area under the supervision of faculty.
6. Learn teaching techniques by directing the acute pain service under the supervision of faculty in the second half of the academic year.
7. Participate in the education of residents and student nurse anesthetists as part of the fellow's clinical commitment in the general OR.
8. Review and enhance web-based teaching resources including the resident handbook, curriculum document, and self-study and testing materials.

Monthly participation in resident education activities

1. First day of each month a fellow is responsible for giving the "nuts and bolts" presentation and ensuring new rotating residents have viewed the lecture and been given the opportunity to ask questions if not available on the day it was given (i.e., post call from another service, etc.)
2. Review and select articles for monthly journal club and moderate each monthly Journal Club session; attendance is expected monthly when not on vacation.
3. Monthly creation of a PowerPoint presentation for a topic for Wednesday subspecialty conferences.
4. Participation in the annual resident lecture series (Usually November) organized by Dr. Reynolds.
5. The fellow is expected to remain to assist with all block procedures and ensure patient disposition is accounted for before leaving the unit.
    a. Block assignments are to be made for the following day in consultation with the attending faculty member responsible for the following day's regional assignment.
    b. Daily operating room schedule surveillance for patients with appropriate diagnoses and procedure posting.
    c. Operating Room scheduling for the next day's patients to be brought to regional for block consideration is to be done daily before 10 am when possible.

Practice-Based Learning:

1. Evaluate and apply evidence from scientific studies, expert guidelines, and practice pathways.

2. Use information technology to obtain and record patient information, access institutional and national policies and guidelines, and participate in self education.
3. Evaluate own practice with respect to patient outcomes (esp. success and complications from regional block) and compare to available literature.

D) Interpersonal and Communication Skills:
Upon completion of the program, the fellow should be able to:

1. Provide information to the patient and family with respect to the options, alternatives, risks and benefits of regional anesthesia in a manner that is clear, understandable, ethical, and appropriate.
2. Employ effective listening skills and answer questions appropriately in the process of obtaining informed consent.
3. Work effectively in a team environment, communicating and cooperating with surgeons, nurses, pharmacists, physical therapists, and other members of the perioperative team.

This requires the fellow to:

1. Appreciate the roles of other members of the team
2. Communicate clearly in a collegial manner that facilitates the achievement of care goals.
3. Help other members of the team to enhance the sharing of information.
4. Formulate care plans that utilize multidisciplinary team skills such as a plan for facilitated recovery (i.e., ERAS, etc.)

E) Professionalism
Upon completion of the program, the fellow should be able to:

1. Continuously conduct the practice of medicine with integrity, honesty, and accountability.
2. Demonstrate a commitment to life-long learning and excellence in clinical practice.
3. Demonstrate consistent subjugation of self-interest to the good of the patient and the health care needs of society.
4. Demonstrate a commitment to ethical principles in providing care, obtaining informed consent, and maintaining patient confidentiality.

F) Systems-Based Practice
Upon completion of the program, the fellow should be able to:

1. Effectively balance the need for operating room efficiency with a high quality of patient care in the setting of a residency teaching program. The fellow will effectively choose surgeons, patients, techniques and approaches to achieve the best balance possible in order to use regional anesthesia to improve recovery.

2. Understand the interaction of the Acute Pain Management Service with other elements of the health care system including primary surgical and medical teams, other consultant services, nursing, pharmacy, and physical therapy.
3. Demonstrate awareness of health care costs and resource allocation, and the impact of their choices on those costs and resources.
4. Advocate for the patient and their family within the health care system, and assist them in understanding and negotiating complexities in that system.

VII.) Evaluation and Advising:

Attending faculty will be evaluated by the fellows annually.

Evaluation of the fellows will take place no less than quarterly.

The Fellowship Director will meet with the Fellow at regular intervals to review performance, scholarly activity, and achievement of personal and program objectives.

The Director will perform the role of faculty advisor unless the fellow requests alternative faculty advising.