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## Message from Chairman

Jeffrey Brown, MD



Jeffrey Brown, MD

When I first arrived in Toledo, Ohio I had the good sense to attend Grand Rounds in Ann Arbor at The University of Michigan. This was when both Edgar Kahn and Richard Schneider, pioneers both in neurosurgery, were active attendees.

Their presence allowed for a fascinating breadth of knowledge and experience to be communicated in each session. In his autobiographical "Journal of a Neurosurgeon," Dr. Kahn wrote of his training in the treatment of trigeminal neuralgia under Dr. Max Peet, the preeminent speedy practitioner of the subtemporal approach to the trigeminal ganglion. Dr. Peet "frequently divided the sensory root of the Gasserian ganglion ten minutes after making the skin incision." More important than the surgical technique, Dr. Kahn wrote of the life lesson he acquired from Dr. Peet.

He wrote, "...the *good* surgeon is one... who makes a difficult operation look easy. I have often thought of what a great surgeon Joe DiMaggio might have made." Dr. Kahn continues, "Speed in surgery is... a matter of knowing what one wants to do and then doing it...It is comparable to good art. Examine a line drawing by Picasso or Matisse and see the marvelous effect they achieve with so few lines."

In my last message, I wrote of the sculptural art of ancient Greece and Italy and how the artists of that era were able to capture in marble the expressions of anguish that permeate the soul of one who is patient with his suffering. The word patient is after all derived from the Latin *patientia*, suffering, and, according to the OED, was probably first used

in its modern connotation in English by Chaucer in the fourteenth century, "To us Surgeons aperteneth...to our patienz that we do no damage." It is significant that the first usage of this now well used word is tied to our also well known first rule of surgery. It is also important that in the summary words of Dr. Kahn's own story, he chose a chapter on his "Exposure to Art."

In an era of managed care and outcome evaluation, where management consultants retain power over physician professionals, there is no box to check on the surgeon's scorecard representing the artfulness he exudes while delivering his care. It is, of course, "care" that we are in the business of providing. Instead of evaluating the clarity of the lines that a Picasso paints, we review the minutes spent in the operating room and length of stay in the hospital. "Care" evaluation translates to bargraphs on a "patient satisfaction" survey. Great art and great care are, however, priceless.

Often we are as neurosurgeons at odds with that which will provide immediate satisfaction to our patients who are in chronic pain - more narcotics or another spine procedure. In past symposia the section has addressed the rational use of narcotics in chronic benign pain to address this central problem to our practice. This topic will be revisited during the breakfast seminar on "Neurosurgical Management of Intractable Pain" to be given during the upcoming AANS Annual Meeting in New Orleans. Other topics discussed in this seminar should include DREZ surgery, spinal stimulation and infusion techniques and neurostimulation for intractable ischemic chest pain.

Our section symposium at this meeting will be on the treatment of the cranial cephalgias. Practical Workshops are offered on Trigemini-

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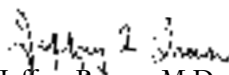
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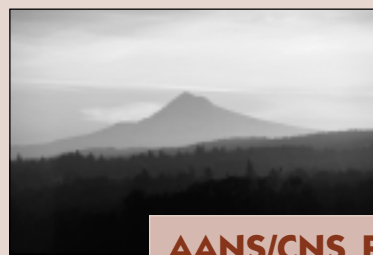
nal Neuralgia and Minimally Invasive Procedures for Spinal Pain Syndromes. This is a new workshop and will teach percutaneous techniques for the diagnosis and treatment in the spine. Such techniques include many that are more often performed by anesthesiologists: facet and root blocks, epidural injections and sympathetic blocks. Also to be discussed will be discography and intradiscal therapy. Another breakfast seminar offered will cover "Contemporary Percutaneous Techniques for Trigeminal Neuralgia." In addition to the section symposium and scientific papers during the section meeting, there will be a paper of interest presented in the opening Plenary Session on the treatment of neuropathic facial pain by motor cortex stimulation.

On the Thursday and Friday April 22-23, 1999 preceding the AANS Annual Meeting the Section will sponsor our Satellite Symposium on Pain Management. Ken Follett and Sam Hassenbusch have once again organized this well-received and comprehensive program that will include both didactic and practical sessions. This year, as was done last year, a CD-ROM will be published after the symposium containing the audiotaped presentations and digitized slides of all formal didactic sessions.

A subspecialty fellowship training proposal has been forwarded by the Joint Section on Pain to both the Society of Neurological Surgeons and the Residency Review Committee for evaluation. These organizations will review it in parallel as organized neurosurgery moves closer towards accreditation of subspecialty fellowship programs in pain, pediatric, tumor and vascular neurosurgery. These proposals are available for review through **N:\NON-CALL®**. Jaime Henderson has worked diligently to design our contribution to neurosurgery's home on the internet. Also available is a proposed core curriculum for progressive education in neurosurgical pain management during residency training. Kim Burchiel and Ken Follett have developed these detailed proposals. The documents should help us to standardize the education of neurosurgeons in this field. I encourage discussion and further comment from each of you.

In April I will become a member of The Board of Directors of the AANS representing the interests of the Pain Section and the Northwest Quadrant of the CSNS. The AANS in the last three years has moved to integrate the voice of the Pain Section and all other sections into the strategic planning of the organization. The surgery and treatment of pain is integral to all other areas of neurosurgery. It remains our responsibility as neurosurgeons with special interest and expertise in this field to maintain our presence.

  
Jeffrey Brown, M.D.  
Medical College of Ohio



**AANS/CNS Pain Course  
6-7 August 1999  
Oregon Health Sciences University  
Portland OR.**

**Course Description**

The course is designed to provide advanced didactic information and hands-on training in interventional therapies for pain management. The course will focus on both ablative and augmentative techniques for neurosurgical pain control in a variety of conditions. The emphasis will be on practical training for neurosurgeons who have already incorporated aspects of surgical pain management in their own practices, and who wish to update and refine their skills in this area.

**Who Should Attend**

Neurosurgeons, nurse practitioners, physician assistants, anesthesiologists and nurses who are currently involved in surgical pain management. Prior attendance at a basic pain management course (AANS, CNS, or the Joint Section on Pain Satellite Symposium) is required.

For additional information, please contact  
AANS Professional Development Office (847) 692-9700

**Colleagues:**

An application for membership in the Joint Section on Pain can be found on page 15 or at <http://www.ohsu.edu/som-neurosurgery/news/membershipapp.html>. We encourage you to forward this application to colleagues with interests in pain management.

The goals of the Section are to assure the highest quality of medical care for the management of patients with pain problems and to assure an appropriate socioeconomic and political climate conducive to the effective and efficient delivery of medical care to patients with pain problems.

# The Trigeminal Neuralgia Association

## President Claire Patterson

**M**ost neurosurgeons are keenly aware of the plight of a trigeminal neuralgia patient when they have reached that level of intractable pain and their quality of life is totally diminished. What you may not be aware of is that there is an organization dedicated to addressing the problems confronting these individuals who are afflicted with this excruciatingly painful disorder.

The Trigeminal Neuralgia Association (TNA) is a nonprofit, tax exempt organization founded in 1990 to provide support and encouragement to TN patients, to promote awareness of TN among the public and among the professional medical and dental communities, and to act as an advocate for TN research. Aided by a Medical Advisory Board of national composition and reputation, the Association's numbers have swelled to over 9,000 patients. It offers its resources without charge via mailings and the Internet and recently held its second National Conference attended by physicians and patients from the U.S. and overseas. The Association also sponsors 41 support groups throughout the U.S. to provide encouragement and comfort to TN patients on a local and personal level. Two groups have formed in Canada and one is forming in the U.K.

Since its inception, the Association has seen as its organizational priority the dissemination to TN patients of credible information concerning available medical and surgical options. At the same time, the Association seeks to reduce the isolation of those affected by this disorder. These twofold objectives are achieved through a variety of means including:

- Telephone Access to the Association's Staff and Volunteer Support Contacts
- Distribution of Informational Packages
- Newsletters
- The Association's Internet Web site: <http://neurosurgery.mgh.harvard.edu/tna/>
- Local Support Group Meetings and mailings
- Biennial National Conferences for Physicians and Patients

Aided by its Medical Advisory Board TNA recently has undertaken the development of the first patient registry for TN patients and others with acute facial pain. A two page survey containing patient history concerning onset, medical and surgical treatments, outcome and patient satisfaction, as well as other personal characteristics, such as hereditary factors, was mailed to over 9,000 patients in TNA's database. The returns are being compiled by the University of Arkansas. Hopefully, data retrieved from the survey will provide a valuable insight into the nature of this disorder and treatment effectiveness.

In July of this year NIH in conjunction with TNA is planning to hold its first all-day scientific meeting on trigeminal neuralgia. Leaders in clinical research and clinical management will come together to share findings and develop priorities to address the

present and future needs in the treatment of TN. Hopefully, this initial meeting will be the precursor of many more into the investigation of this perplexing and painful disorder.

If you have a keen interest in trigeminal neuralgia and are interested in knowing more about TNA, you may contact the national office at:

**Trigeminal Neuralgia Association,**  
P.O. Box 340, Barnegat Light, NJ 08006  
Telephone: 609-361-1014 Fax: 609-361-0982  
E-mail: [tna@csionline.net](mailto:tna@csionline.net)

or feel free to contact one of your colleagues who is a member of the TNA Medical Advisory Board ((Affiliations (listed below))):

- Dr. Peter Jannetta, M.D., Chairman, University of Pittsburgh School of Medicine, Dept. of Neurological Surgery  
Dr. John F. Alksne, M.D., University of California, San Diego Medical Center  
Dr. Ronald I. Apfelbaum, M.D., University of Utah Medical Center (Neurosurgery)  
Dr. Ronald Brisman, M.D., Columbia Presbyterian Medical Center, Neurological Institute, New York  
Dr. Kim J. Burchiel, M.D., Oregon Health Sciences University (Neurosurgery)  
Dr. J. Kieth Campbell, M.D., Mayo Clinic-Rochester MN (Neurology)  
Dr. Kenneth F. Casey, M.D., Allegheny University of the Health Sciences, Philadelphia (Neurosurgery)  
Dr. R.A. de los Reyes, M.D., Beth Israel Medical Center-North Division (Neurosurgery)  
Dr. Steven B. Graff-Radford, D.D.S. The Pain Center, Cedars-Sinai Medical Center  
Dr. Stephen J. Haines, M.D., Medical University of South Carolina  
Dr. Yoshio Hosobuchi, M.D., Straub Clinic and Hospital, Honolulu (Neurosurgery)  
Dr. Edward R. Laws Jr., M.D., University of Virginia School of Medicine (Neurosurgery)  
Dr. Parker Mahan, D.D.S., Ph.D., University of Florida College of Dentistry, Facial Pain Center  
Dr. Albert L. Rhoton Jr., M.D., University of Florida College of Medicine, (Neurosurgery)  
Dr. John M. Tew Jr., M.D., University of Cincinnati Medical Center  
April H. Vallerand, Ph.D., R.N., University of Pennsylvania School of Nursing  
Dr. Charles B. Wilson, M.D., University of California San Francisco (Neurosurgery)  
Dr. Ronald F. Young, M.D., Northwest Hospital Gamma Knife Center, (Neurosurgery)

# Application of Ablative Techniques, Neurosurgical Management of Chronic Pain

Nicholas M. Barbaro, M.D.

The decision to use ablative techniques to treat neuropathic pain is a complicated one. Certain painful conditions have been shown with excellent long-term studies to be well-treated using ablative techniques; others have not. The fact that the injury to the nervous system is the origin of a given painful condition should give any careful physician pause before offering a treatment that is designed to add new neurological injury. Nevertheless, certain guidelines can be used in making such a decision. These include the fact that all reasonable medical treatments have been tried, that non-destructive procedures have either been tried or are considered ineffective for the pain in question, and that methods (i.e. nerve blocks) which can temporarily test the effect of denervation have proven highly successful. Neuromodulatory techniques such as spinal cord or brain stimulation or neurochemical techniques such as intrathecal drug infusion systems offer the advantage of being reversible and non-destructive. Neuroablative techniques offer the advantage of possibly reducing or eliminating pain without a need for ongoing hardware maintenance and are typically less costly than neuroaugmentative approaches.

Neuroablative procedures that have been shown to be successful in treating neuropathic pain states include the following. Radiofrequency trigeminal rhizolysis (RFL) is an effective treatment for trigeminal neuralgia. Dorsal root entry lesions (DREZ) are effective in reducing or eliminating pain caused by brachial or lumbosacral plexus avulsion and for spinal cord injury pain at the edge of the neurologic deficit (so-called "end zone" pain). Percutaneous cordotomy is indicated in the treatment of unilateral extremity pain caused by malignant disease in patients with a short life expectancy. In each of these procedures, the outcome is as much determined by proper patient selection as by proper techniques in performing the procedure. For example, attempts to use RFL to treat patients who do not have typical trigeminal neuralgia are usually not successful and relatively frequently result in worsening of the patient's complaints of pain. Likewise, use of the DREZ procedure for upper extremity painful conditions not caused by nerve root avulsion, or in spinal cord injury pain of the diffuse variety will usually not reduce and may actually increase pain.

The principals of lesion making are similar for all procedures that involve radiofrequency techniques. These techniques typically require a combination of anatomical and physiological guidance prior to making a lesion. Anatomical landmarks may be based on direct vision as in the DREZ procedure or radiographic images such as with trigeminal RFL where skull-base fluoroscopic images are used. Physiological guidance is best obtained from the patient during the procedure using the nerve stimulator function of the radiofrequency generator. The amount of current required to

produce a physiological effect, typically a report of paresthesias, as well as the location of that effect are important parameters. The specific guidelines for a given procedure are usually explained in the literature describing that procedure with modifications based on the surgeon's experience.

Neuroablative techniques with relatively high reported success rates, but which are performed by relatively few surgeons include cingulumotomy, mesencephalotomy and nucleus caudalis DREZ. Cingulumotomy has been reported to reduce painful conditions of both malignant and non-malignant origin. It requires a stereotaxic approach and has a very low complication rate. The same procedure has been used to treat psychiatric conditions such as obsessive-compulsive disorder. Mesencephalotomy also requires stereotaxic guidance but has a higher rate of new neurological injury to nearby brainstem structures. The nucleus caudalis DREZ procedure has been used for a variety of

## CD-ROM:

### "Interventional Therapies in the Neurosurgical Treatment of Pain"

The Joint Section on Pain has produced a CD-ROM entitled "Interventional Therapies in Neurosurgical Pain Management". The CD is based on the highly successful and well-attended Satellite Symposium held preceding the AANS Annual meeting this past Spring. Each of the twenty-five lectures delivered at the symposium can be viewed. Speakers' slides are digitized and synchronized to the audiotaped presentations. Slides can be enlarged for clearer study. One may take as much time as needed to understand them best. The lectures can be easily reviewed on any computer with a CD-ROM drive. The CD should serve as an excellent curriculum for the neurosurgical treatment of pain for neurosurgeons with a general practice, for those with special interest in pain neurosurgery and for residents in every training program in neurosurgery. It can be purchased through the Joint Section on Pain and the AANS and can also be order on line at <http://www.aans.org/sections/pain/teaser.html>.

A sample presentation, Chronic Pain Types and Treatment Algorithms by Robert M. Levy, will soon be available as an example of the CD-ROM content.

facial pain conditions including refractory trigeminal neuralgia, and other neuropathic facial pains. It requires direct exposure of the caudal brainstem and should probably be performed only by surgeons with extensive experience in this area.

A few other neuroablative procedures deserve mention. Radiofrequency rhizolysis of thoracic nerves can be used to treat neuropathic pains caused by injury to the nerves originating from thoracic roots. These include intercostal neuralgia, post-thoracotomy or post-nephrectomy pain, and injury to abdominal cutaneous nerves. In such cases, patients should receive excellent pain relief by paraspinal nerve blocks before a permanently destructive procedure is performed. A similar procedure can be successful in treating nerve injury pain following inguinal hernia repair. In such cases, patients should receive near-total pain relief from a T-12 paraspinal block. This can be followed with a T-12 paraspinal rhizolysis. In each of these procedures, it is recommended that the patient be awake for a portion of the procedure so that physiologic feedback can be obtained before performing the rhizolysis.

These and other neuroablative procedures in the treatment of neuropathic pain should be performed only after a thorough review of the patient's pain history including a psychological profile, after all reasonable medications have been tried, and after consideration of non-destructive techniques. Patients should be warned that, occasionally, pain will be worsened by these techniques. In properly selected cases, neuroablative techniques will give highly rewarding pain relief without a need for maintenance of pumps or stimulators.

**The Following books have recently become available at <http://www.amazon.com>:**

**The Management of Pain**

by Michael A., Md. Ashburn (Editor), Linda J., Md. Rice (Editor)

**Oxford Textbook of Palliative Medicine** (Oxford Medical Publications)

by Derek Doyle (Editor), Geoffrey W. C. Hanke (Editor), Neil MacDonald (Editor)  
Published: January 1998

**Neural Blockade in Clinical Anesthesia and Management of Pain**

by Michael J. Cousins (Editor), Phillip Bridenbaugh  
Published: January 1998

**Proceedings of the 8th World Congress on Pain (Progress in Pain Research and Management, V. 8)**

by B.C./Jensen, Troels Staeheli World Congress on Pain 1996 Vancouver  
Published: June 1997

**Image-Guided Pain Management**

by P. Sebastian Thomas (Editor)  
Published: January 1997

**Neurosurgical Management of Pain**

by Robert M. Levy and Richard B. North  
Published: November 1, 1996

**Save These Dates!**

**The American Association of Neurological Surgeons**

**Annual Meeting  
April 24–29, 1999  
New Orleans**



**Congress of Neurological Surgeons**

**Annual Meeting  
October 30–  
November 4, 1999  
Boston**



## Selected Abstracts from the 48th Annual Meeting of the Congress of Neurological Surgeons

October 3-8, 1998

### Trial of Analgesic Epidural Paste in Lumbar Decompressive Surgery\*\*

Nicholas Theodore, MD  
R. John Hurlbert, MD, PhD\*  
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Recently, there have been significant advances in the management of chronic pain syndromes. Little attention, however, has been paid to the treatment of postoperative pain. While usually only temporary, postoperative pain is a source of great concern to patients undergoing any type of surgical procedure. Significant pain after surgery can prolong hospital stays and delay patients from returning to work.

Recently, an analgesic epidural paste (AEP) was developed to treat postoperative pain after lumbar decompressive surgery, (1). Consisting of a base of microfibrillar collagen with epidural morphine, methylprednisolone, and aminocaproic acid, AEP is applied directly to the dura after surgery. Although initial results were promising, the compound was not tested in a rigorous fashion.

Consequently, a prospective, randomized, double-blind trial was undertaken at the Barrow Neurological Institute with secondary analysis at the University of Calgary. Sixty patients undergoing first-time lumbar decompressive surgery were stratified by procedure (laminectomy, n=30; discectomy, n=30) and randomized into either the active (AEP) or placebo group. All surgeries were performed by a single surgeon and postoperative pain medication, as needed, was standardized for all patients. Patients were evaluated preoperatively and monitored for 3 months after surgery with the final follow-up scheduled at 1 year.

Physician-derived outcome measures included a detailed neurological examination. Patient-derived outcomes consisted of the Pain Rating Index PRI(R), the Number Words Chosen (NWC), and the measure of Present Pain Intensity (PPI) on the McGill Pain Questionnaire (MPQ), the Aberdeen Back Pain Index (ABPI), and the SF-36. Hospital-derived outcomes included vital signs, length of stay, amount of pain medication used, and complications.

Preoperatively, both groups were similar with respect to demographic characteristics, neurological status, and level of pain. There were no difference in length of stay between groups. The incidence of urinary retention in the AEP group did not increase compared to the placebo group. There were no instances of respiratory depression in either group. Two AEP patients did have superficial wound infections, which were managed on an outpatient basis with oral antibiotics.

Reports of pain on the McGill PRI(R) ( $p=0.022$ ) and NWC ( $p=0.035$ ) indices were significantly lower for the AEP group for 6 weeks after surgery compared to those of the placebo group, as were reports on the McGill PPI ( $p=0.005$ ) index for 3 weeks after surgery. Compared to the placebo group, the AEP group's perception of general health as reported on the SF-36 survey was significantly enhanced ( $p=0.015$ ), and the effect persisted for 6 weeks after surgery. The AEP group showed a trend toward reporting more improvement on the ABPI than the placebo group, but statistical significance was not reached.

This study demonstrates that application of an AEP at the time of lumbar decompressive surgery can positively affect patients' perceptions of pain, can decrease the amount of narcotics they use postoperatively, and can enhance patients' perceptions of their general health for as long as 6 weeks after surgery. After a 1-year follow-up, no long-term complications have been related to the use of this compound.

#### Reference

1. Needham CW: Painless lumbar surgery: Morphine nerve paste. *Connecticut Medicine* 60:141-143, 1996.

\*\*This article has been accepted for publication in *The Journal of Neurosurgery: Spine*, April 1999

**The Effect of Timing of Local Anesthetic Administration on Functional Outcome in Lumbar Discectomy Patients - A Prospective Randomized Controlled Trial.**

**Kathryn Holloway, MD**  
**James Embry, CRNA, PhD**  
**Patricia Finestone, RN**

*Richmond, VA*

**Introduction:** Although lumbar discectomy is highly effective in resolving pain in the vast majority of patients, there still remains a rather frustrating group of postoperative failed back patients. An exaggerated response to pain may play a role in this group. This exaggerated response may have a physiologic basis. Studies in animals have shown that prolonged and substantial cutaneous receptive field changes in dorsal horn neurons can be produced by brief inputs from peripheral unmyelinated afferent fibers in decerebrate spinal rats. This tissue injury results in an increased sensitivity to stimuli post-injury (1). This and other works has suggested that surgical trauma may lead to long term changes within the central nervous system which results in an increased sensitivity to pain in the surgical area (2,3,5). Woolf and Wall (6) have shown that this sensitization can be prevented by neural blockade with local anesthetic when administered prior to the injury. This has led to the hypothesis that pre-incisional local anesthetic (preemptive analgesia) may be more effective than post-procedural local anesthetic in preventing long-term pain amplification in lumbar discectomy patients. To test this hypothesis, we performed a prospective randomized controlled trial to examine the effect of pre-incisional versus post-procedural Marcaine in 42 lumbar discectomy patient's postoperative pain and function.

**Methods:** All patients who were scheduled to undergo a first time lumbar discectomy within the Department of Neurosurgery at The Virginia Commonwealth University/The Medical College of Virginia were identified and were offered the opportunity to participate in the study. Patients were excluded if they had risk factors for administration of bupivacaine or epinephrine. The patients gave informed consent in accordance with the Institutional Review Board of the Medical College of Virginia. On the day of surgery, the operating room nurse made up 2 syringes, one containing 1-200,000 epinephrine and the other containing 1-200,000 epinephrine and 0.5% bupivacaine. The order of administration of these two syringes was randomized. The first syringe was administered immediately after the prep and at least 3 minutes prior to the incision. The second syringe was injected at wound closure. Twenty cc's were infiltrated on the side of the dissection, attempting to fully infiltrate the skin, paraspinal muscles and periosteum. If the

patient was to undergo bilateral discectomy or discectomy at another level, an additional 20cc's was infiltrated in a similar fashion at that site. Both the pre-incisional and the postprocedural infiltrations were done in a similar fashion.

We chose outcome measures which identified patients who may be considered "failed back" patients. The three main outcome measures of the study were narcotic usage, continued pain at 6 weeks, and lack of improvement in function on the Prolo scale at 3 months. (Table 1) (4).

**Table 1: Baseline Characteristics**

	Preop Bupivacaine	Postop Bupivacaine
N	20	24
Age	41.9 (20-75)	43.7 (21-73)
% Female	60%	58.3%
# Smokers	65%	50%
Pain Durn > 1 yr	10%	25%
Secondary Gain	35%	37.5%
Preop VAS -S	3.3 (.4-7.2)	3.8 (.4-10)
Preop VAS -A	4.0 (.4-10)	5.1 (.4-10)
Preop Prolo-E < 3	75%	41.7%
Preop Prolo-F < 3	90%	91.6%
Preop Narcotics:		
# Patients	8	9
Av Morph Equiv.	82.2 (6.8-189)	25.6 (2.8-47.3)

The narcotic outcome measure equalled the total milligrams of morphine equivalents consumed by the patient during the first 6 weeks after the surgery. In addition, we analyzed the narcotics used while in the hospital immediately postoperatively excluding the discharge medications. The preoperative and 6 week postoperative Visual Analog Pain Scale (VAS) scores were used to define the number of patients whose pain did not improve with surgery. A VAS failure consisted of a postoperative score greater than 0 and a postoperative minus preoperative score which was greater than or equal to 0. The preoperative and 3 month Prolo scores were used to identify the number of patients who did not see an improvement in their level of function at home or at work. A Prolo failure was considered a postoperative score of less than 5 with a postoperative minus preoperative score less than or equal to 0.

The baseline characteristics of age, sex, smoking history, pain duration greater than 1 year, the presence of secondary gain, pre-op VAS and Prolo Scores, the preoperative use of narcotics and their amount were then subjected to step-wise linear regression to assess if any of these factors predicted outcome.

**Results:** Forty-four patients were randomized. Twenty patients were in group A and received the bupivacaine prior to the incision. Twenty-four patients were randomized to received the bupivacaine at the end of the procedure. The forty-two

*continued on page 8*

patients had one level, one sided discectomies and received 20cc of 0.5% bupivacaine, and two patients received a total of 40cc's. The baseline characteristics of the two patient populations are listed in Table 2.

**Table 2: Prolo Score<sup>(4)</sup>**

**Economic Status**

- E1: Complete invalid
- E2: No gainful occupation including ability to do housework or continue retirement activities
- E3: Able to work but not at previous occupation
- E4: Working at previous occupation part-time or limited status
- E5: Able to work at previous occupation with no restrictions of any kind

**Functional Status**

- F1: Total incapacity (or worse than before operation)
- F2: Mild to moderate level of lower back pain and/or sciatica (or pain same as before operation) but able to perform all daily tasks of living.
- F3: Low level of pain and able to perform all activities except sports
- F4: No pain, but patient has had one or more recurrences of lower back pain or sciatica
- F5: Complete recovery, no recurrent episodes of lower back pain, able to perform all previous sports activities

The two groups had some dissimilarities at baseline. The difference in preoperative narcotics was predominately due to one patient in the preoperative bupivacaine group who had very high consumption of narcotics preoperatively. There was a difference in the economic scores with a larger number of patients in the preoperative bupivacaine group not working at the time of surgery, however, a greater number of patients in the postoperative bupivacaine group had pain for more than a year. A linear regression analysis revealed that none of these baseline characteristics predicted outcome. The results of the main outcome measure analyses are shown in Table 3. The narcotic usage, both in the hospital and for the total postoperative period was not significantly different between the two groups. The higher total usage in the preoperative bupivacaine group was due to one patient.

**Table 3: Outcome**

	Preop Bupivacaine	Postop Bupivacaine
Narcotic Usage* <sup>1</sup>		
In Hospital	50.8 (sd 33.8)	47.7 (sd 45.3)
Total	105.7 (sd 169.3)	77.7 (sd 81.5)
#VAS Failures* <sup>2</sup>		
Sensory	4 (20%)	4 (16.7%)
Affective	4 (20%)	4 (16.7%)
#Prolo Failures* <sup>3</sup>		
Economic	3 (15%)	7 (29%) (p=.26)
Functional	5 (25%)	9 (37.5%) (p=.37)

\*<sup>1</sup> In Morphine equivalents  
\*<sup>2</sup> VAS Failure = postop score >0 and postop -preop > 0  
\*<sup>3</sup> Prolo Failure = postop score <5 and postop-preop < 0

The number of VAS failures at 6 weeks were also not significantly different in the two groups. The patients who failed to demonstrate improved function at 3 months were considered Prolo failures. The rate of economic Prolo failures was nearly twice as high in the patients who did not receive preemptive analgesia. The functional scale showed a difference in the same direction, however, neither of these differences were statistically significant.

**Discussion:** In summary, 44 virgin lumbar discectomy patients were given preoperative bupivacaine. The only difference in the treatment of these two groups was whether the bupivacaine was administered prior to the procedure in a preemptive analgesic fashion or administered after the procedure was completed. The number of "failed backs" in the two groups were compared. We did not see a difference in the amount of narcotics consumed in the hospital or after discharge or the 6 week VAS scores. We did detect a difference in the patients improvement in function in both their work and home activities at 3 months, with patients who were given preemptive analgesic experiencing one half the failure rate of the other group, however, this was not statistically significant. We did not identify any baseline characteristics which predicted outcome.

**References:**

1. Cook AJ, *et al*, Nature 325:151-153, 1987.
2. Dahl JB, *et al*, ACTA Anesthesiol Scand 38:557-561, 1994.
3. Kehlet H, Br J Anesth 63:189-195, 1989.
4. Prolo DJ, *et al*, Spine 11(6):601-606, 1986.
5. Woolf CJ, Nature 306:686-688, 1983.
6. Woolf CJ, Wall PD, J Neurosci 6:1433-1442, 1986.

**The Use of Laboratory Autonomic Function Tests in Evaluating the Results of Spinal Cord Stimulation (SCS) in Reflex Sympathetic Dystrophy**

**Ricardo Segal, MD**  
**Michael Giuliani, MD**  
**Brett Stacey, MD**  
**Margaret-Beth Ott, BA**

*Pittsburg, PA*

**Objective:** A prospective study of 40 CRPS patients referred to a neurosurgeon for management and treatment of chronic pain after failing non-interventional multidisciplinary treatment at a Pain Clinic was conducted in order to validate the role of autonomic function tests (AFT) in the diagnosis of CRPS and to determine the effectiveness of spinal cord stimulation (SCS).

**Methods:** Diagnoses of CRPS type I and II were made/confirmed using the Putative Diagnostic Criteria for Reflex Sympathetic Dystrophy as proposed by Wilson. AFT obtained included Resting Sweat Output (RSO), Quantitative Sudomotor Axon Reflex Test (QSART), and Thermography.

**Clinical Signs/Symptoms**

Burning pain  
 Hyperpathia/allodynia  
 Temperature/color changes  
 Edema  
 Hair/nail growth

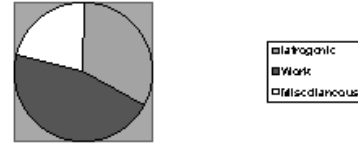
**Laboratory Results**

QSART /Thermography  
 Bone X-ray studies  
 Three phase bone scan  
 Response to sympathetic blocks

A score of 6 or more was diagnosed as “probably RSD” (55%), 3-5 as “possible RSD” (17.5%), and less than three as “unlikely RSD” (15%). The remaining 12.5% either refused testing or results are pending. Once a diagnoses of CRPS was confirmed, the diagnosis was further classified into CRPS-I (reflex sympathetic dystrophy) and CRPS-II (causalgia) according to whether a nerve injury was documented or not. Using this criteria, we found that 72% qualified as CRPS-I and 28% as CRPS-II.

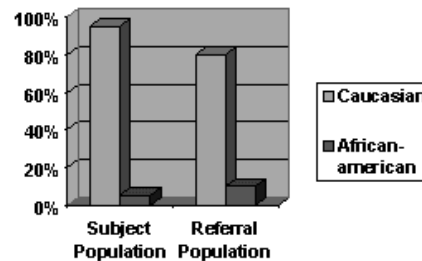
Upper extremities were affected in 60% of the cases and lower extremities in 40%. Of the 24 subjects whose upper extremities were affected, 19 were affected in a single extremity, 2 bilaterally, and 2 were migratory (right to left and left upper to bilateral lowers). Sixteen patients reported origin of symptoms in the lower extremities in which 12 were affected in a single extremity, 1 bilaterally, and 3 were migratory although only subjective symptoms were recorded in one case.

The etiology of CRPS was divided into three categories: iatrogenic, work-related trauma, and miscellaneous.



In the iatrogenic category, 9 cases resulted from surgical procedures, one experienced pain following venipuncture, and one suffered a lacerated left hand in an industrial accident. Subjects categorized in the work-related trauma classification revealed employment in the manual/construction, health/personal care giver, administrative, and service genres. Finally, the miscellaneous category was comprised of 3 motor vehicle accidents, 5 non-work related traumas, angina pectoris, cerebral palsy, cervical spondylotic radiculopathy, and cervical spondylotic myelopathy.

The racial and gender composition of the CRPS cohort was compared to the racial and gender composition of the entire patient population referred to the neurosurgery clinic of the neurosurgery author (RS) during the time of the study.



**Results:** Resting sweat output is unreliable because patients may have anhidrosis or hypohidrosis requiring a high gain. Quantitative Sudomotor Axon Reflex Test (QSART) response morphology was variable: 13% were poor, 22% were prolonged “hung up”, 47 were normal, and 19% were not available. Output was abnormal in 53%. One hundred percent (100%) of the thermographic studies were abnormal revealing asymmetry meaning the asymptomatic limb was colder (74%) or warmer (26%). The ratio of colder to warmer was 4:1. Patterns of autonomic function testing abnormalities revealed 54% positive thermography and QSART, 42% positive thermography negative QSART, 1% negative thermography positive QSART. There were no reported cases of negative QSART and thermography.

Ten out of 15 patients succeeded a three-day SCS trial and underwent implantation of an Itriel® Generator. A Resume® lead was placed in four cervical and one lumbar cases, and a Pisces-Quadripolar® lead in two cervical and four lumbar

*continued on page 10*

cases. Follow up ranged from eight to 62 months with a mean of 40 months. Pain control was rated as excellent in five, very good in three, good in 2, and poor in 1. AFTs were again obtained approximately three months after SCS implant. Postoperative thermography resulted in improvement in 82%, unchanged in 9%, and worsening in 9%. Postoperative QSARTs resulted in improvement in 50%, unchanged in 40%, and worsening in 10%. RSO decreased 0.59 ml (0.9-1.71) in four and increased 0.2 ml (0.18-0.23) in five. QSART increased 3.01 ml (0.58-7.55) in three while decreasing 2.33 ml (0.28-7.76) in seven. Temperature increased in 10/11 cases, an average 2.5°C (0.5-7). AFT deteriorated in one patient experiencing recurrence of symptoms with generator exhaustion. However, AFT did not deteriorate in patients reporting worsening of symptoms coinciding with litigation without objective findings. Migration occurred in four patients confirmed with AFT. Of those refusing SCS, two patients opted for sympathectomy, one chose re-neurolysis, two are in litigation, and the remaining 16 are being treated with non-interventional modalities. Four patients are completing testing. One patient requested removal of her stimulator due to contralateral FBSS and depression symptoms in spite of her improvement of CRPS-II.

**Conclusion:** We found that the use of AFT has been helpful not only in validating the diagnosis of CRPS, the use of AFT is also valuable in objectively assessing improvement with treatment in patients with CRPS. We have obtained significant improvement in the control of signs and symptoms of CRPS with SCS. We have found that SCS may lead to normalization or improvement from both excessive or deficient sweat production. That would support the hypothesis that reflex pattern changes in postganglionic cutaneous vasoconstrictor neurons in CRPS are related to central (dorsal horn?) changes. We speculate this is obtained by central modulation of the sudomotor reflex by afferent stimulation.

#### **Facet Denervation with Fluoroscopically-assisted Laser Guided Radiofrequency Rhizotomy**

**Michael K Landi, MD**  
**Robert J Plunkett, MD**

*Buffalo, NY*

**Introduction:** A simplified method of targeting spine landmarks for percutaneous procedures reducing x-ray exposure to patient and operating room staff was designed and applied to facet radiofrequency (RF) rhizotomy. The technique uses the Dual Radiation Targeting System (DRTS - Minrad, Inc., Orchard Park, NY).

A laser targeting system for fluoroscopically guided procedures was developed and used to provide accurate surface point of entry and angle of approach to spine landmarks (figure 1). The system identifies a path of radiation from the x-ray source to the image intensifier, positions a laser beam on that line and provides a target symbol visible on the video monitor. After fluoroscopic cross-hair target localization, radiation is turned off, and the laser beam guides needle placement to the target. Highly accurate needle placement is easily performed, while ionizing radiation, and patient discomfort and procedure time are reduced. The early experience with facet blocks and RF rhizotomy using this technique is reported.

The contribution to back pain from the spine lumbar facets has been studied for many years (Goldthwait, Putti, Williams, Ghormley). Ghormley described the facet syndrome in 1933 relating facet arthropathy to low back pain and leg pain.

Partial denervation of the facet joints was described by Rees in 1971 using a stiletto-like knife. Because of problems with hematoma formation, Shealy introduced percutaneous RF thermocoagulation as an alternative.

For carefully selected patients, percutaneous radiofrequency rhizotomy is an effective means of treating mechanical low back syndrome (MLBS). Outcome studies of the effectiveness of this treatment have shown consistency. Comparing outcome, patients were divided into three groups: 1: virgin back; 2: previously operated (unfused); 3: previously operated (fused) Table 1.

**Anatomy:** Facet innervation is principally derived from the medial branch of the posterior ramus that arises just distal to the dorsal root ganglion at each spinal level.

The main fibers of the medial branch pass around the facet capsule, over the transverse process to the inferior aspect of the facet joint. At this point the nerve divides, proximally it enters the facet capsule, distally it descends to innervate the superior aspect of the next inferior facet. Intermingled with these fibers are small fibers that come from other spinal levels, even from the contralateral facet. Because of the complex neuroanastomoses it is unlikely that the facet can be totally denervated with percutaneous rhizotomy.

**Facet Rhizotomy Technique:** The junction of the transverse process and the pedicle are targeted using fluoroscopy and the DRTS. X-ray radiation is turned off and the laser beam is used to guide a RF needle through the soft tissues to the transverse process. The needle tip is then "walked" in a cephalad direction until it just slips over the edge of the transverse process-pedicle interface. The radiofrequency generator is then connected to the needle. With stimulation, needle placement in proximity to the facet nerve fibers will result in reproduction of the patient's local back pain. If the RF needle is adjacent to the nerve root, radicular symptoms will result. After satisfactory needle placement, a thermal lesion is made with the radiofrequency generator.

**Results:** Four patients underwent RF rhizotomy from L3-S1

(32 facets) for mechanical low back pain syndrome. All obtained good relief of pain. The DRTS system was useful and accurate in the localization of RF targets and guiding RF needle placement.

**Table 1: Reported results of good to excellent outcome after RF rhizotomy (%)**

Group	Shealy	Burton	McCulluch	Lora	Oudenhoven
1	80	67	62	61	68
2	40	—	20	35	35
3	29	—	—	—	—
#patients	380	126	82	119	801

**References:**

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10. Shealy CN: Percutaneous radiofrequency denervation of spinal facets and treatment for chronic back pain and sciatica. *J Neurosurg* 43:448-451, 1975.
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**DRTS Mounted on fluoroscope (Philips BV300)**

**Figure 1**



**A.** X-ray of facet targeting **B.** X-ray of facet targeting with RF aligned with laser **C.** Oblique x-ray of facet targeting with RF positioned

*\*figures from Ray CD: Percutaneous radiofrequency facet nerve blocks: treatment of the mechanical lo-back pain syndrome. Radionics procedure technique series, 1982, with permission.*

**Radiosurgical Treatment of Trigeminal Neuralgia with the Leskell Gamma Knife: Promising Early Results**

**J. Adair Prall, MD**  
**Mary Sherman, RN**  
**Corrine Cloughen, RN**  
**Joseph Henderson, PhD**

*Denver, CO*

**Introduction:** Recently, reports have emerged suggesting acceptable treatment results for patients with trigeminal neuralgia (TN) using the Leskell Gamma Knife (LGK), [1,2]. Success rates appear to approach those of percutaneous rhizotomy and microvascular decompression series. In light of the favorable outcomes reported in these series, we examined the results at our own center. Determinations of outcomes were made both with scales used in other LGK series and with those traditionally employed. Attempts were also made to identify subgroups with superior outcomes.

**Materials and Methods:** The LGK unit at the Rocky Mountain Gamma Knife Center (RMGKC) has been in operation since 1993. During that period, over 600 patients have been treated radiosurgically for different indications. Of these, fifty-two were treated for trigeminal neuralgia. No patients treated for this indication were excluded from review. Eight different neurosurgeons were involved in these treatments. A review of the epidemiology, treatment parameters and outcomes of this series of patients was performed. Outcomes were assessed by telephone interview in most cases, in order to obtain current data. Interviews were performed by RMGKC nursing staff, following a template of questions. Outcome grading was performed in a manner similar to that of other LGK series, rating patients as complete success (no pain, off medications), partial success (incomplete pain relief and/or decreased requirement for medication) and failure (no pain

*continued on page 12*

relief, no decrease in medication requirement). Patients were also graded by more traditional means, in terms of success (no pain, with or without medication) or failure (any persistent pain). Attempts were always made to wean medications after resolution of pain following treatment, but not all patients have completed their medication wean at the time of this review.

All patients underwent single shot treatments using a 4 millimeter collimator. Maximum treatment doses ranged from 30 Gray (associated tumor) to 90 Gray, the latter having been prescribed in most recent patients. Except in three cases with associated tumors, all patients were treated targeting the root entry zone of the trigeminal nerve on the affected side. The 50th percentile isodose contour included a thin rim of the lateral pons in most cases. Steroids and perioperative adjustments in medications were not routinely performed. Anticonvulsant medications were routinely weaned several weeks after complete resolution of symptoms.

Statistical analyses were performed using chi-square testing and Fisher's exact test. Statistical significance was defined by a P less than or equal to 0.05.

**Results:** The results of the first fifty-two consecutive cases of TN treated at this center were reviewed. Fifteen of these were male, 15 had prior surgical treatments, and 2 had prior LGK treatments. Fifty had classic TN pain, 6 had multiple sclerosis, and 3 had associated tumors. The mean age of the entire group was 64 years, with 16 cases of V1 pain, 44 cases of V2 pain, 26 cases of V3 pain and 31 cases with multiple distributions affected. Twenty-eight patients had pain on the right, twenty-four on the left. A maximum dose of 90 Gy was prescribed in 5 patients, 80 Gy in 20 patients, 70 Gy in 16 patients and 30, 40 and 50 Gy in three others (one tumor and two repeat LGK treatments). Maximum doses at repeat procedures were prescribed in order to give cumulative doses not to exceed 120 Gy.

Follow-up could be obtained on only 44/52(84%) patients. Of the eight patients without follow-up, six (11%) had deceased of unrelated causes, leaving only two (4%) who could not be located. The mean length of follow-up was 9.0 months (range 1-39 months). Outcomes graded by the two methods described in the Methods section are shown in Figure 1. Both immediate and most recent results are shown. Onset of improvement ranged from one day to four months, but shorter delays were seen with higher maximum doses. Of the fifteen cases considered failures, ten (67%) have had less than six months follow-up. Four patients (9%) have suffered recurrences after initially complete resolution of their symptoms. These occurred at 4, 4, 16 and 19 months. Four patients underwent subsequent procedures: 2 LGK procedures (4.5 and 16 months after initial LGK procedure), 2 microvascular decompressions (7, 27 months) and 1 rhizotomy (5 months). No patient suffered a complication, including any numbness or paresthesia.

Mean age did not vary significantly among outcome groups, although failures tended to be older (64.4 years vs. 73.2 years). No

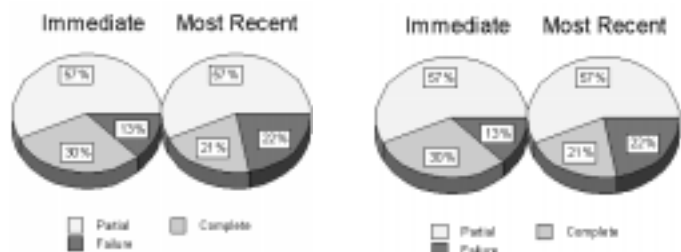
significant differences were seen relating to gender, maximum dose, diagnosis of multiple sclerosis or prior treatment status, although in the last there was a trend toward success in those without prior treatment ( $p=0.07$ ). When groups were broken down into those followed less than or more than 6 months ( $N=22$  in each subgroup), however, a statistically significant difference emerged in the latter group (those with >6 months follow-up) between patients with and without prior treatments ( $p<0.05$ ). The success rate among those without prior treatment and with >6 months of follow-up was 87%(13/15), in contrast to 42%(3/7) among those with >6 months follow-up with prior treatment.

**Conclusions:** The results of the current review appear to be in good agreement with those of other LGK series. In the two largest, the multicenter series and the Seattle experience [1,2], complete resolution of pain occurred in 58-75% of patients. The combined groups of complete and near-complete resolution of pain account for 78-94% of the totals in the two series. In the current study, 78% of patients had complete or partial resolution of their symptoms; however, the use of the traditional success/failure outcome grading produces only a 66% success rate. Certainly, this adjustment supports detractors of the LGK's effectiveness, resulting in a lower success rate than more established methods (i.e., percutaneous techniques, microvascular decompression).

However, among those in the current series without prior treatment who had at least six months of follow-up, 87% had complete resolution, rivaling or surpassing results from MVD series, [3]. Long term results could compare favorably with those of both MVD or rhizotomy series, depending on recurrence rates using the LGK. These recurrence rates are currently unknown but hover around 10% in the short term in this and other published series, [1,2].

Escalating radiation dose did not appear to improve outcome, nor did it increase complications. Differences in outcome among varying maximum doses may be hidden by the small size of this series, however. Higher maximum doses seem likely to further injure the nerve, but there may be a trade-off point where complications begin to appear with greater frequency. We have not reached that point at 90 Gy, in our experience. Changes must be made slowly, though, so that any delayed complications will be noted prior to dose escalation.

Both the small number of patients and the relatively short follow-up in this series hinder the significance of its findings; however, these results are promising even when graded with traditional outcome scales. Future reviews of LGK results must adhere to the standards of outcome grading used in series of other types of surgical therapy for TN (i.e., stricter success/failure grading), in order for LGK to be taken seriously as a first-line therapy for this condition. Longer follow-up will be necessary in order to better establish the rate of recurrence in LGK-treated patients and to compare their outcome with those treated by more established methods.



**Figure 1:** Immediate results are compared to those at most recent follow-up; the two grading schemes resemble that found in other LGK series (complete/partial/failure) and that used in most other reviews of rhizotomy and MVD (success/failure).

### References:

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### DREZ for Recurrent Head and Neck Pain

**Dennis E Bullard, MD**  
**Blaine S Nashold, Jr MD**

*Raleigh, NC*

Refractory pain involving the head and neck is often unresponsive to medical or conventional surgical regimens when prior ablative procedures have failed. During a three-year period, 20 patients with severe refractory head and neck pain had caudalis DREZs with or without cervical extension. All had prior ablative procedures including; peripheral or central nerve sectioning, percutaneous procedures, or DREZs. Primary etiologies included; 7 patients with refractory trigeminal neuralgia, 4 with atypical headaches or facial pain, 3 with post traumatic closed head injuries, 3 that had undergone prior oral or sinus surgeries, 2 with multiple sclerosis, and 1 that had cancer related pain. At the time of discharge, satisfactory pain relief was present in all patients. At 3 months following surgery, 17 (85%) had good to excellent results and 3 had recurrent pain. At one year following surgery, 13 patients could be evaluated, 7 (69%) still considered their relief as good to excellent. Transient postoperative ataxia was present in 12/20 patients (60%), but was largely resolved at 1

month. In 3/13 (23%) patients, however, a degree of ataxia was still present at one year. Two patients had transient diplopia, 2 had increased corneal anesthesia. No surgical or post surgical mortality was noted. The extension of facial pain into the head and neck or recurrence of head or neck pain after the initial ablative surgery was a poor prognostic indicator for the DREZ. A prior DREZ did not preclude a satisfactory result as long as intraoperative evoked potential localization was possible and ablation of aberrant input obtained. For many patients with refractory head and neck pain, this procedure appears to be successful. Adequate prior training and intraoperative monitoring experience are crucial for success.

### The Effect of Medial Thalamus Stimulation on Spinal Cord Dorsal Horn Neuron Responses to Noxious Visceral Stimulation in Rats

**Kenneth A Follett, MD, PhD**  
**SW Yang, MD**

*Iowa City, IA*

We have shown that neurons in Nucleus Sumedius (Sm) of the medial thalamus respond to noxious visceral stimulation. We now hypothesize that Sm may have a role in descending modulation of visceral nociception. In this study, we evaluated the effect of Sm activation on visceral nociceptive activity at the spinal level.

In halothane-anesthetized rats, responses of spinal dorsal horn neurons (L6-S1) to noxious visceral stimulation (colorectal balloon distension, CRD) were characterized using standard extracellular microelectrode recording techniques. The effect of focal electrical stimulation of Sm on these responses was elevated. Forty-seven neurons were isolated. Thirty-six responded to CRD. Twenty-five had excitatory and 11 had inhibitory responses. Neurons showed graded responses to graded CRD pressures (20-100mmHg). Responses to noxious (pinch, heat) and innocuous (brush, tap) cutaneous stimuli were studied in 28 CRD-responsive and 10 CRD-nonresponsive neurons. Thirty-four of these neurons (89%) had cutaneous receptive fields, generally small and ipsilateral. Sixty-eight percent of these neurons responded to both noxious and innocuous stimuli, 29% were nociceptive-specific and 3% responded only to innocuous stimuli. Stimulation of Sm (100Hz, 100ms pulse width, 100-300 microA) produced statistically significant ( $p < 0.05$ , ANOVA) intensity-dependent attenuation of CRD responses of most neurons (7/9 of CRD-excited and 3/4 of CRD-inhibited) tested. Sm stimulation had no effect on spontaneous activity.

These data indicate that Sm may be involved in descending inhibitory modulation of visceral nociception at the spinal level. This "stimulation-produced analgesia" may be mediated via relays in ventrolateral orbital cortex and/or periqueductal gray.

# Calendar of Events

**July 1999** (precise date to be determined)

## **1st Scientific Meeting of The Trigeminal Neuralgia Association/NIH on Trigeminal Neuralgia**

Location: To be determined  
Contact: Trigeminal Neuralgia Association  
P.O. Box 340  
Barnegat Light, NJ 08006  
Telephone: 609-361-1014  
Fax: 609-361-0982  
E-mail: [tna@csionline.net](mailto:tna@csionline.net)  
WWW: <http://neurosurgery.mgh.harvard.edu/tna>

**6-7 August 1999**

## **AANS Advanced Surgical Pain Management Course**

Location: Portland, OR  
Contact: AANS Professional Development Office  
Phone: 847-692-9700

**22 - 27 August 1999**

## **9th World Congress on Pain**

Location: Vienna, Austria  
Contact: IASP Secretariat,  
909 NE 43rd Street,  
Suite 306, Seattle 98105  
Phone: 206-547-6409  
Fax: 206-547-1703  
E-mail: [iasp@locke.hs.washington.edu](mailto:iasp@locke.hs.washington.edu)

**21-24 October 1999**

## **18th Annual Scientific Meeting American Pain Society**

Contact: American Pain Society  
4700 W. Lake Avenue  
Glenview, IL 60025-1485  
Location: Ft. Lauderdale, FL  
Phone: 847-375-4715  
Fax: 847-375-4777  
E-mail: [info@ampainsoc.org](mailto:info@ampainsoc.org)

**30 October-4 November 1999**

## **49th Congress of Neurological Surgeons Annual Meeting**

Location: Boston, MA  
WWW: <http://www.aans.org/meetings/cns/summary.html>

**2-5 November 2000**

## **19th Annual Scientific Meeting American Pain Society**

Location: Hyatt Regency Atlanta, Atlanta, GA  
E-mail: [info@ampainsoc.org](mailto:info@ampainsoc.org)



**Of Interest at the AANS  
67th Annual Meeting  
24-29 April 1999  
Louisiana, New Orleans**

### **AANS/CNS Section on Pain Satellite Workshop Interventional Therapies in Neurosurgical Pain Management**

8:00 AM-6:00 PM

Thursday-Friday, 22-23 April 1999,

This workshop will include both didactic and hands on sessions and will be of interest to neurosurgeons wishing to become more familiar with the various neurosurgical pain procedures and provide more service to multidisciplinary pain management groups. This is a unique workshop designed to facilitate comprehensive and intensive learning of interventional therapies for pain management. It will cover both augmentative and ablative therapies at spinal, trigeminal, intracranial and peripheral nerve levels. The faculty is composed of 20 leading U.S. pain management neurosurgeons, as well as faculty representation by a pain physiatrist and a pain anesthesiologist. There will be a special emphasis on the close interaction between the faculty and workshop participants. (A preliminary agenda is available at <http://www.aans.org/>)

### **Contemporary Management of Trigeminal Neuralgia. Monday 26 April 1999, Breakfast Seminar 106**

**707. Epidural Motor Cortex Stimulation for Neuropathic Facial Pain: Interim Analysis and Results From Treatment of 13 Patients in a Multicenter Prospective Trial  
Monday 26 April 1999, Plenary Session I**

### **Neurosurgical Management of Intractable Pain Tuesday 27 April 1999, Breakfast Seminar 209**

### **AANS/CNS Section on Pain**

2:45 PM-5:30 PM

**Tuesday 27 April 1999**

This session will serve as a forum for the presentation of topics on the neurosurgical management of pain.

Special Symposium 2:45 PM-4:00 PM

The Surgical Management of Cephalgias

Scientific Session 4:00 PM-5:30 PM

### **Educational Seminar Topics of Interest to Primary Care Physicians**

1:00 PM-3:30 PM,

**Wednesday 28 April 1999**

Lead Topic **Low Back Pain**

Second Topic **Chronic Pain**

Final Topic **Stroke Prevention and Treatment**

# Application for Membership



## AANS/CNS Section on Pain

### I. Biographical

Name: \_\_\_\_\_  
Birth Place: \_\_\_\_\_ Birth Date: \_\_\_\_\_  
Citizenship \_\_\_\_\_  
Home Address: \_\_\_\_\_ Office Address: \_\_\_\_\_  
\_\_\_\_\_  
Fax: \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Phone: \_\_\_\_\_

### II. Category of Membership Requested:

Active  Associate  Corresponding

### III. Education

Premedical collegiate education (institutions/dates) \_\_\_\_\_  
Final degree (institutions/dates) \_\_\_\_\_  
Medical education (institutions/dates) \_\_\_\_\_  
Final degree (institutions/dates) \_\_\_\_\_  
Internship or equivalent (institutions/dates) \_\_\_\_\_  
Residency or other graduate training (institutions/dates) \_\_\_\_\_  
Residency training institution \_\_\_\_\_  
Completion (or expected completion) Date \_\_\_\_\_

### IV. Membership, Certification and Practice

Are you now certified by the American Board of Neurological Surgery?  Yes/Year \_\_\_\_\_  No  
Are you certified in neurosurgery by another examining board?  Yes/Year \_\_\_\_\_  No

#### Are you a member of:

- American Medical Association
- Local or regional medical society Name: \_\_\_\_\_
- State or provincial medical society Name: \_\_\_\_\_
- American Association of Neurological Surgeons
- Congress of Neurological Surgeons
- American Academy of Pain
- International Association for the Study of Pain
- American Pain Society

Medical Licensure State \_\_\_\_\_ Dates \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

**Please return completed application to:**  
**Section on Pain**  
**Membership Department**  
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**Park Ridge, IL 60068**

**AANS/CNS Section on Pain**  
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