

Rishi N. Sheth, M.D.
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Appointment and Employment

07/2013-present Affiliate, Associate Professor, Florida Atlantic University

11/2012-present Boca Raton Regional Hospital, Boca Raton, FL
Delray Medical Center, Delray Beach, FL

11/2010-07/2012 Orlando Regional Medical Center, Orlando, FL
Florida Hospital, Orlando, FL

08/2008-08/2010 St Catherine Medical Center, Long Island, New York

07/2007-06/2008 Clinical Instructor in Department of Neurosurgery,
Memorial Sloan-Kettering Cancer Center, New York, NY

Education and Postgraduate Training

07/2007-06/2008 Clinical Fellowship in Neurosurgical Oncology
Memorial Sloan-Kettering Cancer Center, New York, New York
Director: Philip Gutin, M.D.

10/2004-06/2005 Postdoctoral Research Fellowship in Neurosurgery
University of Miami School of Medicine, Miami, Florida
Preceptor: Allan Levi, M.D., Ph.D.

10/2003-09/2004 Clinical Fellowship in Spine Surgery
University of Miami School of Medicine, Miami, Florida
Director: Allan Levi, M.D., Ph.D.

07/2001-06/2007 Residency in Neurological Surgery
University of Miami School of Medicine, Miami, Florida
Director: Roberto Heros, M.D.

07/2000-06/2001 Internship in General Surgery
University of Miami School of Medicine, Miami, Florida

- 05/1998-06/2000 Postdoctoral Research Fellowship in Neurosurgery
Johns Hopkins University School of Medicine, Baltimore, Maryland
Preceptor: James N. Campbell, M.D.
- 09/1990-12/1997 Doctor of Medicine. University Medical School of Debrecen
Debrecen, Hungary
GPA **4.86/5.00. Summa cum Laude**

Certification

- 05/2013 Board Certified, American Board of Neurological Surgery
- 03/2005 American Board of Neurological Surgeons
Primary written examination passed
Score: **635 (96th percentile)**
- 09/2002 USMLE
Parts I-III completed
ECFMG Certification (# 0-546-105-8)

Licensure

- 2005 New York State License: 243622-1(Inactive Status)
2005 Florida State License: ME 98749 (Active Status)

Honors and Awards

- 2006 Award 'Third place' for poster presentation at the American Association of Neurological Surgeons
- 2005 Award 'Resident Travel Scholarship' for the North American Spine Society Meeting
- 2005 Award 'Best Presentation' at the Rosomoff Research Day
- 2005 Award 'Highest Board Score of the Year'
- 2001 Award 'Outstanding Intern of the Year'
- 1997 Class Valedictorian
- 1992-1997 Tuition Merit Scholarship

Membership in Professional Organization

- 2001-2010 Congress of Neurological Surgeons
2001-2010 American Association of Neurological Surgeons

Research Experience

- 1996 Studied the long-term outcome of vasospasm following aneurysmal subarachnoid hemorrhage.
Dept. of Neurosurgery, University Medical School of Debrecen, Hungary.
Preceptor: Sandor Szabo, M.D.
- 06/1996-07/1996 Studied the neuropsychological outcome of neurosurgical patients with cerebrovascular anomalies.
Department of Neurosurgery, Johns Hopkins University School of Medicine.
Preceptor: Daniele Rigamonti, M.D., F.A.C.S.
- 05/1998-06/2000
- Mapped the mouse Saphaneous nerve innervation territory using the plasma extravasation technique with nerve stimulation.
 - Mapped the dermatomes of mouse foot using the epidermal nerve counts technique after selective isolation and ligation of lumbar spinal nerves.
 - Developed the technique for chronic lumbar catheterization of the subarachnoid space for drug delivery in a mouse model.
 - Studied sensation to noxious mechanical and thermal stimuli in mice with NT-3 gene deletion as compared to the normal wild type mice.
 - Developed the mouse model of neuropathic pain by L5 nerve root transection and psychophysical testing of mechanical hyperalgesia until their recovery.
 - Studied PET analysis of changes in binding of μ -opioid receptor in the human brain following capsaicin-induced pain.
 - Conducted clinical research: Randomized study on long-term outcome of surgeries for thoracic outlet syndrome.
 - Studied how the nature of lesion influences the severity of hyperalgesia and its correlation with regenerating fibers in sciatic nerve and foot in rats epidermis.
 - Studied the role of peripheral sensory and motor system in producing hyperalgesia after a nerve injury.
 - Studied the influence of different diets on the severity of formalin induced inflammatory pain.
 - Studied the effect of Naloxone on the perception of capsaicin induced pain.
- Department of Neurosurgery, Johns Hopkins University School of Medicine.
Preceptor: James Campbell, M.D.

- 10/2004-06/2005
- Transplanted human derived bone marrow stem cells into contused nude rats' spinal cord.
Department of Neurosurgery, University of Miami School of Medicine.
Preceptor: Allan Levi, M.D.; Ph.D.
 - Developing piglet model for direct infusion of chemotherapeutic agent into the fourth ventricle.
Department of Neurosurgery, University of Miami School of Medicine.
Preceptor: David Sandberg, M.D.

Publications

Articles:

1. **Sheth RN**: A study of the long-term outcome of vasospasm following aneurysmal subarachnoid hemorrhage. Thesis submitted as part of the requirement for the degree of Doctor of Medicine, University Medical School of Debrecen, Hungary, 1997.
2. Szabo S, **Sheth RN**, Novak L, Rosza L, Ficzer A: Cerebrovascular reserve capacity many years after vasospasm due to aneurysmal subarachnoid hemorrhage. *Stroke*. 28: 2479-2482, 1997.
3. Mansikka HT, **Sheth RN**, DeVries C, Lee H, Winchurch R, Raja SN: Nerve injury-induced mechanical but not thermal hyperalgesia is attenuated in neurokinin-1 receptor knockout mice. *Exp Neurol*. 2000 Apr; 162 (2):343-9.
4. Shir Y, **Sheth RN**, Campbell JN, Raja SN, Seltzer Z: Soy-containing diet suppresses chronic neuropathic sensory disorder in rats. *Anesth Analg*. 2001 Apr; 92 (4):1029-34.
5. **Sheth RN**, Dorsi MJ, Li Y, Murinson BB, Belzberg AJ, Griffin JW, Meyer RA: Mechanical hyperalgesia after an L5 ventral rhizotomy or an L5 ganglionectomy in the rat. *Pain*. 2002 Mar; 96 (1-2):63-72.
6. Anderson W, **Sheth RN**, Bencherif B, Frost J, Campbell J: Naloxone increases pain induced by topical capsaicin in healthy human volunteers. *Pain*. 2002 Sept; 99 (1-2):207.
7. Bencherif B, Fuchs PN, **Sheth RN**, Dannals B, Campbell JN, Frost JJ: Pain activation of human supraspinal opioid pathways as demonstrated by [11C]-carfentanil and positron emission tomography (PET). *Pain*. 2002 Oct; 99(3):589-598.
8. Lancelotta MP, **Sheth RN**, Meyer RA, Belzberg AJ, Griffin JW, Campbell JN: Severity and

duration of hyperalgesia in rat varies with type of nerve lesion. *Neurosurgery*. 2003 Nov; 53(5):1200-8.

9. Mansikka HT, Zhao C, **Sheth RN**, Sora I, Uhl G, Raja SN: Nerve injury induces a tonic bilateral μ -opioid receptor mediated inhibitory effect on mechanical allodynia in mice. *Anesthesiology*. 2004; 100:912-21.
10. **Sheth RN**, Campbell JN: The surgical treatment of thoracic outlet syndrome: A randomized trial comparing two operations. *J Neurosurg: Spine*. 2005 Nov; 3: 355-363.
11. Vitarbo E, **Sheth RN**, Levi A: Open door expansile cervical laminoplasty. *Neurosurgery*. 2007 Jan; 60(Supp1 1): S154-9.
12. Tummala RP, Heros RC, **Sheth RN**, El-Hammady SE, Morcos JJ: Surgical management of giant aneurysms of the middle cerebral artery. *Operative Techniques in Neurosurgery*. 2005; 8:85-92.
13. Jea A, **Sheth RN**, Vanni S, Green BA, Levi AD: Modification of Wright's technique for placement of bilateral crossing C2 translaminar screws: Technical note. *Spine J*. 2007; Jul 30.
14. **Sheth RN**, Manzano G, Li X, Levi A: Transplantation of human bone marrow-derived stromal cells into contused spinal cord of nude rats. *J Neurosurg Spine*. 2008 Feb;8(2):153-62.
15. Thompson SM, Duque CS, **Sheth RN**, Casiano RR, Morcos JJ, Gomez-Fernandez CR: Case Report: Liposarcoma of the sinonasal tract. *BJR* 2009 Aug;82(980):160-3.
16. **Sheth RN**, Thompson S, Morcos JJ: Drop metastasis from primary intracranial mesenchymal chondrosarcoma: Case report. *Ann Neurosurg* 2009; 9(7): 1-9.
17. **Sheth RN**, Placantonakis D, Gutin PH: Intracranial and Spinal Metastases from Eccrine Mucinous Carcinoma: A Case Report. *Neurosurgery*. 2010 Sep;67(3): E861-2.
18. Patel RH, Sheth RN: Post-operative emergence of acute brachial neuritis following posterior cervical laminectomy with fusion: A case report and review of the literature. *Int J Surg Case REP*. 2019; 65: 197-200.
19. Patel RH, Sheth R, Hus N: Complex Regional Pain Syndrome caused by an Axillary Lipoma. *Cureus*. 2020; 12(12): e12280.

Book Chapters:

1. **Sheth RN**, Belzberg AJ: Diagnosis and Treatment of Thoracic Outlet Syndrome. *Neurosurg Clin N Am*. 2001 Apr; 12(2): 295-309.

2. Tummala RP, **Sheth RN**, Heros RC. Hemodilution and fluid therapy in neurosurgery. In: Clinical Neurosurgery. Proceedings of the Congress of Neurological Surgeons. Vol. 53, Lippincott Williams and Wilkins. 2006, pp. 238-251.
3. **Sheth RN**, Manzano G, Levi A: Post-traumatic syringomyelia. In Vaccaro A and Anderson P (eds): Cervical spine trauma. Lippincott Williams and Wilkins. 2010, pp.551-558.
4. Manzano G, **Sheth RN**, Levi A: The management of post-traumatic syringomyelia. In Kim DH, Ludwig SC, Vaccaro A and Chang JC (eds): Atlas of spine trauma: Adult and pediatric spine. Elsevier Inc, Health Sciences. 2008. pp.660-665.

Abstracts:

1. Bencherif B, Oropeza M, Fuchs PN, **Sheth RN**, Li ST, Ravert H, Musachio J, Mathews B, Dannals B, Campbell JN, Frost JJ: Regional μ -opioid receptor binding changes in healthy controls following capsaicin-induced pain and their relationships to pain intensity, Supplement to Journal of Cerebral Blood Flow and Metabolism. 19 suppl 1: S317, 1999.
2. **Sheth RN**, Lancelotta M, Meyer RA, Campbell JN: Behavioral signs of pain in the rat are influenced by the technique of axotomy. Journal of Reconstructive Microsurgery. 1999 Nov; 15.

Journal Cover:

1. **Sheth RN**, Campbell JN: The surgical treatment of thoracic outlet syndrome: A randomized trial comparing two operations. J Neurosurg: Spine. 2005 Nov; 3: 355-363.

Presentations

1. Mansikka HT, **Sheth RN**, Winchurch R, Raja SN: Mechanical but not thermal hyperalgesia after nerve injury is attenuated in neurokinin-1 receptor knockout mice. Poster Presentation at the 29th Annual Meeting of the Society for Neuroscience, Miami Beach, Florida, October 23-28, 1999.
2. Raja SN, Mansikka HT, **Sheth RN**, Winchurch R: Nerve injury-induced mechanical but not thermal hyperalgesia is attenuated in neurokinin-1 receptor knockout mice. Poster Presentation at the American Association of Anesthesiologists, Dallas, Texas, October 9-13, 1999.
3. **Sheth RN**, Lancelotta M, Meyer RA, Belzberg AJ, Campbell JN: Axotomy and pain. Oral Presentation at the 9th Annual Meeting of the American Society of Peripheral Nerve, Los Angeles, California, June 19-21, 1999.

4. Lancelotta M, **Sheth RN**, Meyer RA, Belzberg AJ, Campbell JN: The type of nerve injury influences the severity and the duration of hyperalgesia in rats. Poster Presentation at the 9th World Congress on Pain, Vienna, Austria, August 22-27, 1999.
5. Bencherif, B, Oropeza M, Fuchs PN, **Sheth RN**, Li ST, Ravert H, Musachio J, Mathews B, Dannals, B, Campbell JN, Frost JJ: PET scan analysis of opioid receptor binding during a tonic painful stimulus in normal human subjects. Poster Presentation at the 9th World Congress on Pain, Vienna, Austria, August 22-27, 1999.
6. Mansikka HT, **Sheth RN**, Shiotani M, Winchurch R, Raja SN: Capsaicin and nerve injury-induced hyperalgesia is attenuated in neurokinin-1 receptor knockout mice. Poster Presentation at the 9th World Congress on Pain, Vienna, Austria, August 22-27, 1999.
7. Campbell JN, **Sheth RN**: Transaxillary resection of the first rib is a better operation for thoracic outlet syndrome (TOS) than supraclavicular neuroplasty of the brachial plexus: Results of a randomized study. Oral Presentation at the 68th Annual Meeting of the American Association of Neurological Surgeons, San Francisco, California, April 8-13, 2000.
8. **Sheth RN**, Lancelotta M, Meyer RA, Belzberg AJ, Campbell JN: Duration and severity of hyperalgesia after nerve root section in rat is worse with cut and ligation compared to crush injury. Oral Presentation at the 68th Annual Meeting of the American Association of Neurological Surgeons, San Francisco, California, April 8-13, 2000.
9. **Sheth RN**, Mansikka H, Ringkamp M, Meyer RA, Raja SN: NT-3 +/- mice exhibit blunted responses to nociceptive stimuli but still develop hyperalgesia after nerve injury. Poster Presentation at the 19th Annual Meeting of the American Pain Society, Atlanta, Georgia, November 2-5 2000.
10. Anderson WS, **Sheth RN**, Bencherif B, Frost JJ, Campbell JN: Is acute pain modulated by endogenous opioid mediated inhibition? Oral Presentation at the 30th Annual Meeting of the Society of Neuroscience, New Orleans, Louisiana, November 4-9, 2000.
11. Shir Y, Anderson WS, **Sheth RN**, Raja SN, Belzberg AJ, Campbell JN: Soy enriched diets do not suppress hyperalgesia associated with inflammation in rats. Poster Presentation at the 30th Annual Meeting of the Society of Neuroscience, New Orleans, Louisiana, November 4-9, 2000.
12. Bencherif B, Fuchs PN, **Sheth RN**, Oropeza M, Musachio JL, Mathews B, Dannals RF, Campbell JN, Frost JJ: Acute pain activation of supraspinal opioid pathways shown with positron emission tomography in humans. Oral Presentation at the 30th Annual Meeting of the Society of Neuroscience, New Orleans, Louisiana, November 4-9, 2000.
13. **Sheth RN**, Mansikka H, Ringkamp M, Meyer RA, Raja SN: NT-3 +/- mice exhibit blunted responses to nociceptive stimuli but still develop hyperalgesia after nerve injury. Poster Presentation at the 30th Annual Meeting of the Society of Neuroscience, New Orleans, Louisiana, November 4-9, 2000.

14. SN Raja, Mansikka H, **Sheth RN**, Sora I, Uhl G: Enhancement of mechanical hyperalgesia after nerve injury in the mu-opioid receptor knockout mice. Poster Presentation at the 30th Annual Meeting of the Society of Neuroscience, New Orleans, Louisiana, November 4-9, 2000.
15. Dorsi MJ, **Sheth RN**, Li Y, Murinson BB, Belzberg AJ, Griffin JW, Meyer RA: Mechanical hyperalgesia after an L5 ventral rhizotomy or an L5 ganglionectomy in the rat. Poster Presentation at the 31st Annual Meeting of the Society of Neuroscience, San Diego, California, November 10-15, 2001.
16. Raja SN, Mansikka HT, Zhao C, **Sheth RN**, Uhl GR: Mu-opioid receptors exert a tonic inhibitory effect on nerve injury-induced mechanical but not thermal hyperalgesia. Poster Presentation at the Annual Meeting of American Society of Anesthesiologists, New Orleans, Louisiana, October 13-17, 2001.
17. **Sheth RN**, Martinez G, Li X, Tatsui C, Levi A: Neuronal Differentiation of Human Bone Marrow Stem Cells Transplanted into Contused Spinal Cord of Nude Rats. Oral Presentation, Rosomoff Research Day, Miami, Florida, June 4, 2005.
18. Tummala RP, **Sheth RN**, Heros RC: Hemodilution and fluid management in neurosurgery: A clinician's research. Oral Presentation at the 55th Annual Meeting of Congress of Neurological Surgeons, Boston, Massachusetts, October 8-13, 2005.
19. **Sheth RN**, Martinez G, Li X, Levi AD: Survival and differentiation of human bone marrow stem cells transplanted into contused spinal cord of nude rats. Poster Presentation at the 74th Annual Meeting of the American Association of Neurological Surgeons, San Francisco, California, April 22-27, 2006.

Manuscripts Submitted or in Preparation

1. Cheepudomwit T, **Sheth RN**, Campbell JN, Griffin JW: Significance of NGF, MCP-1 and TNF- α to neuropathic pain. (Submitted)
2. Anderson W, **Sheth RN**, Shir Y, Raja SN, Campbell JN: Dietary soy protein does not attenuate formalin induced inflammatory pain in rats. (In preparation)

Courses and Practical Workshops Attended

1. Florida senior resident skull base course. August 19-21, 2005. University of Florida, Gainesville, Florida.
2. Spine surgeon transition program. January 22-23, 2006. Medtronic Sofamor Danek. Memphis, Tennessee

3. Neurosurgery resident's spine education summit. March 2-4, 2006. DePuy Spine. Boston, Massachusetts.
4. Approaches to the skull base for senior Neurosurgical residents. July 28-29, 2006. The Anspach companies. Palm Beach Gardens, Florida.
5. Neurosurgery resident's spine education summit. February 8-10, 2007. DePuy Spine. Las Vegas, Nevada.
6. Spine surgeon transition program. November 15-17, 2007. Medtronic Sofamor Danek. New Orleans, Louisiana.

Lectures and Talks

1. "Thoracic Outlet Syndrome: An Issue in Pain Management and the Results of a Study of the Surgical Outcome." Blaustein Multidisciplinary Pain Conference, Johns Hopkins University School of Medicine, June 11, 1999.
2. "Psychophysics of Neuropathic Pain Models." Blaustein Multidisciplinary Pain Conference, Johns Hopkins University School of Medicine, June 18, 1999.
3. "Neuropathic Pain Varies with Type of Pain Lesion." Neurosurgery Grand Rounds, Johns Hopkins University School of Medicine, July 8, 1999.
4. "Neuropathic Pain: Neurosurgical Intervention at Peripheral and Spinal level." Neurosurgery Grand Rounds, University of Miami School of Medicine, June 13, 2002.
5. "Thoracic Outlet Syndrome." Neurosurgery Grand Rounds, University of Miami School of Medicine, July 17, 2002.
6. "The Posterior Fossa Cisterns." Neurosurgery Grand Rounds, University of Miami School of Medicine, March 24, 2005.
7. "Meningioma: Role of Radiation in Treating Residual Tumor." Neurosurgery Grand Rounds, University of Miami School of Medicine, July 07, 2005.
8. "Thoracic Outlet Syndrome: Treatment Controversies." Neurosurgery Grand Rounds, University of Miami School of Medicine, January 05, 2006.

Certification for Advanced Training

1. Synthes cervical ProDisc-C artificial disc, April 17, 2009.

2. Medtronic cervical Prestige artificial disc, September 11, 2009.
3. Medtronic DLIF, September 11, 2009.
4. Synthes lumbar Pro Disc-L artificial disc, December 13, 2009.
5. DePuy Spine Minimally invasive lumbar spine approaches, May 14, 2011.
6. Mazor Robotics, July 2013
7. D-TRAX system, technique, May 2018
8. ProDisc-C course on technique and indication, July 2018
9. ProDisc-L course on technique and indication, October 2020