

BIOGRAPHICAL SKETCH

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NAME: Shobana Rajan

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Assistant Professor, Anesthesiology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	Completion Date MM/YYYY	FIELD OF STUDY
MADRAS MEDICAL COLLEGE, CHENNAI, INDIA	M.B.B.S	MARCH 1990	MEDICAL SCHOOL
RESIDENT, POST GRADUATE INSTITUTE OF MEDICAL EDUCATION & RESEARCH, CHANDIGARH, INDIA	MD	DEC 1993	ANESTHESIOLOGY
SENIOR RESIDENT ANESTHESIOLOGY (FELLOW LEVEL) SANJAY GANDHI POSTGRADUATE INSTITUTE OF MEDICAL SCIENCES, LUCKNOW, INDIA		JULY 1995	ANESTHESIOLOGY
POST-DOCTORAL CERTIFICATE COURSE (FELLOW LEVEL) SANJAY GANDHI POSTGRADUATE INSTITUTE OF MEDICAL SCIENCES, LUCKNOW, INDIA	PDCC	JULY 1996	CARDIAC ANESTHESIOLOGY
FELLOWSHIP IN NEUROANESTHESIOLOGY RESIDENT(ANESTHESIOLOGY), CLEVELAND CLINIC, OHIO	MD	OCT 2009- OCT 2014	NEUROSURGICAL ANSTHESIOLOGY ANESTHESIOLOGY

A. Personal Statement

I am an enthusiastic neurosurgical anesthesiologist currently working at the Cleveland clinic. Having practiced anesthesiology including neuroanesthesiology for ten years at some of India's top medical centers, I moved to the United States in the middle of a busy career and did a second residency and fellowship in neuroanesthesiology. My research interests focus on tailoring anesthesia in craniotomy patients to optimize perioperative outcome and multimodal analgesia and enhanced recovery protocols in spine surgery. I was funded for a project which compared Dexmedetomidine and Remifentanyl for hemodynamic stability and analgesic requirement after craniotomy showing superiority of Dexmedetomidine. With the current opioid crises, evidence for the use of non-opioid adjuncts for pain control becomes important.

Besides research, I am very passionate about neuroanesthesia education. Being an active member of the education committee of SNACC, I lead the monthly neuroanesthesia quiz team and the residents and fellow's audio corner. I also led the special interest group in neuroanesthesia education last year which is now the Trainee engagement sub-committee of the SNACC which I co-chair.

Unlike other fellowships, neuro-anesthesia fellowship tends to be less sought after. Hence, we conducted a survey last year to assess attitudes about neuroanesthesia fellowships amongst trainees and found that there is a perception that neuroanesthesia offered limited skill sets and residents feel capable of handling complex neuroanesthesia cases without the need for a fellowship. Development of standardized curricula using learning management platforms, increasing opportunities for residents' involvement in SNACC, connecting them to the dynamic leaders in our society, highlighting clinical, translational and basic neuroscience research and working towards accreditation of fellowships could potentially help increase trainee awareness and interest in our specialty. I am committed to working towards achieving these goals.

B. Positions and Honors

- Staff Anesthesiologist, Cleveland Clinic, Departments of General Anesthesia & Outcomes Research
- Assistant Professor Anesthesiology – Case Western Reserve Lerner College of Medicine.
- Associate Program Director, Neuroanesthesia Fellowship, Cleveland Clinic
- Assistant Director PACU, Cleveland Clinic
- Co-Chair, Trainee Engagement Committee, SNACC
- Co- Chair, Special Interest Group in Neuroanesthesia Education, SNACC
- Member, Committee for Technology for Advancement of Education in Anesthesia, Society of Education in Anesthesia.

POSITION/TITLE	HOSPITAL	DATES
ASSISTANT PROFESSOR ANESTHESIOLOGY	SRI RAMACHANDRA MEDICAL COLLEGE & RESEARCH INSTITUTE, CHENNAI, INDIA	SEPTEMBER 1996- DECEMBER 2000
SENIOR CONSULTANT, ANESTHESIOLOGY	APOLLO SPECIALTY HOSPITAL, CHENNAI, INDIA	JANUARY 2001- DECEMBER 2006
ATTENDING ANESTHESIOLOGIST	ALBANY MEDICAL CENTER NEW YORK, NY	OCTOBER 2014- JUNE 2015
STAFF ANESTHESIOLOGIST	CLEVELAND CLINIC, CLEVELAND, OHIO	JULY 2015- CURRENT

C. Contributions to Science – Strategies to effectively manage patients undergoing complex intracranial procedures should start during all phases of patient care, preoperative, intraoperative and postoperative. Pain management, hemodynamic optimization are all crucial when it comes to better outcomes.

a. Clinical Neurosciences

1. The Effects of Dexmedetomidine and Remifentanyl on Hemodynamic Stability and Analgesic Requirement after Craniotomy: A Randomized Controlled Trial.
Rajan S, Hutcherson MT, Sessler DI, Kurz A, Yang D, Ghobrial M, Liu J, Avitsian R.
J Neurosurg Anesthesiol. 2016 Oct;28(4):282-90.
2. Factors predicting incremental administration of antihypertensive boluses during deep brain stimulator placement for Parkinson's disease.
Rajan S, Deogaonkar M, Kaw R, Nada EM, Hernandez AV, Ebrahim Z, Avitsian R.
J Clin Neurosci. 2014 Oct; 21(10):1790-5.
3. Asleep-awake-asleep craniotomy: a comparison with general anesthesia for resection of supratentorial tumors.
Rajan S, Cata JP, Nada E, Weil R, Pal R, Avitsian R; .J Clin Neurosci. 2013 Aug; 20(8):1068-73.

4. Intraoperative Hypotension during Second Stage of Deep Brain Stimulator Placement: Same Day versus Different Day Procedures. Nada EM, Rajan S, Grandhe R, Deogaonkar M, Zimmerman NM, Ebrahim Z, Avitsian R. *World Neurosurg.* 2016 Nov; 95: 40-45.
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- b. **Education** – With the technological boom, residency education will take a new direction in the future. Innovative approaches to teaching like simulation, learning management platforms, inverse classrooms are now on the upswing and I have been working on projects involving these areas.
 1. Comparison of 2 resident learning tools interactive Screen-based simulated case scenarios versus problem-based learning discussions: a prospective quasi crossover cohort study. Rajan S, A. Khanna, R. Avitsian et al; *J Clin Anesth.* 2016 Feb; 28: 4-11.
 2. Simulation versus Problem Based Learning for Cerebrospinal Drainage Catheter Insertion and Management. A Randomized Trial in a Large Academic Anesthesiology Residency Program- Manuscript in consideration for publication. M. Argalious, S. Rajan, et al.
 3. A survey on attitudes regarding neuroanesthesia fellowships amongst attending anesthesiologists, fellows and residents. Shobana Rajan, Jeffrey Pasternak, Angele Marie Theard, Jane Easdown. Manuscript writing in progress.
 - c. **Perioperative outcomes** - Development of standardized evidence based protocols are crucial to optimize perioperative outcomes, ameliorate complications and foster patient satisfaction. I have worked on some projects which involve outcomes after major surgery.
 1. Peri-operative Factors Associated with Acute Kidney Injury after Partial Nephrectomy. Rajan S, Babazade R, Govindarajan SR, Turan A et al; *Br. J. Anaesth.* 2016 Jan; 116(1); 70-6.
 2. Steroid administration after anesthetic induction with etomidate does not reduce in-hospital mortality or cardiovascular morbidity after non-cardiac surgery. R. Komatsu, J. You, S. Rajan, Y. Kasuya, D. I. Sessler and A. Turan. *Br J Anaesth.* 2018 Mar; 120(3):501-508.
 3. Lack of Association between Preoperative Statin Use and Respiratory and Neurologic Complications after Cardiac Surgery. Komatsu R, Yilmaz HO, You J, Bashour CA, Rajan S, Soltesz EG, Sessler DI, Turan A. *Anesthesiology.* 2017 Feb 16.

D. Additional Information: Research Support and/or Scholastic Performance

Grants & Funding

1. Research grant from Hospira for the study “A comparison of remifentanyl versus dexmedetomidine for craniotomy”. (2010)- Study completed, manuscript published 2015 - Cleveland Clinic- Published in the journal of Neurosurgical Anesthesiology.
2. House staff association of the Cleveland clinic grant for conducting a study on “Simulation for education in neuroanesthesia” (year 2011 & 2012). Published in the Journal of Clinical Anesthesia.

Research (in progress)

1. Evaluation of Spine Surgery Analgesic Pathway: A Randomized controlled trial; this trial evaluates multimodal analgesia for spine surgery and development of an enhanced recovery pathway for complex spine procedures. We are still enrolling patients.
2. Chronic use of Angiotensin converting enzyme inhibitors and/or angiotensin receptor blockers are not associated with reduced risk of stroke after non-cardiac surgery – Retrospective review, manuscript writing in progress.

Book Chapters

1. Essentials of pediatric neuroanesthesia; Shobana Rajan, Sanchit Ahuja- *Anesthesia for functional neurosurgery*; (Oxford university press). April 2018
2. Ellenbogen; Principles of Neurological surgery, 4th ed. Elsevier publications. December 2017. Shobana Rajan, Deepak Sharma. *Neuro anesthesia and monitoring for cranial and complex spine surgery*,
3. Essentials of neuroanesthesia and neurointensive care; Shobana Rajan, Sanchit Ahuja - Hypoxic ischemic encephalopathy. Elsevier publications. June 2017
4. Essentials of neuroanesthesia; Shobana Rajan, Shilpa Rao; *Fluids and blood transfusion in pediatrics*- Elsevier publications. April 2017.
5. Complications in neuroanesthesia; Shobana Rajan, Melissa Ehlers, Laura Leduc, *The difficult pediatric airway*. Elsevier publications. 2016
6. Co-existing diseases and Neuroanesthesia. Shobana Rajan, Gargi Banerjee, Kevin Piepsney. *Anesthesia in a patient with liver disease*. (To be published)
7. Anesthesia and geriatric diseases in Neuroanesthesia - Shobana Rajan, Adriana Martin. *Parkinson's disease* (To be published).

Further detailed info on CV