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STAFF ANESTHESIOLOGIST, CLEVELAND CLINIC
DEPARTMENTS OF GENERAL ANESTHESIA & OUTCOMES RESEARCH

ASSISTANT PROFESSOR ANESTHESIOLOGY
CASE WESTERN LERNER COLLEGE OF MEDICINE

ASSOCIATE PROGRAM DIRECTOR,
NEURO-ANESTHESIA FELLOWSHIP, CLEVELAND CLINIC

ASSISTANT DIRECTOR PACU, CLEVELAND CLINIC

CO-CHAIR, TRAINEE ENGAGEMENT COMMITTEE, SNACC

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*Enthusiastic Anesthesiologist committed to advancement of technology
in anesthesia education and opening minds to
Neuroanesthesia.*

PROFESSIONAL APPOINTMENTS/TRAINING

POSITION	INSTITUTION	DATES
STAFF ANESTHESIOLOGIST ASSISTANT PROFESSOR	CLEVELAND CLINIC, OHIO	JULY 2015-CURRENT
ATTENDING ANESTHESIOLOGIST	ALBANY MEDICAL CENTER, NEW YORK	OCTOBER 2014-JUNE 2015
RESIDENT IN ANESTHESIOLOGY	CLEVELAND CLINIC, OHIO	JULY 2010 - JUNE 2014
FELLOWSHIP IN NEUROANESTHESIOLOGY	CLEVELAND CLINIC, OHIO	OCTOBER 2009-JUNE 2010 JULY 2014-OCTOBER 2014
SENIOR CONSULTANT, ANESTHESIOLOGY	APOLLO SPECIALTY HOSPITAL, CHENNAI, INDIA	JANUARY 2001- DECEMBER 2006
ASSISTANT PROFESSOR, ANESTHESIOLOGY	SRI RAMACHANDRA MEDICAL COLLEGE & RESEARCH INSTITUTE, CHENNAI, INDIA	SEPTEMBER 1996- DECEMBER 2000
FELLOW, CARDIAC ANESTHESIOLOGY	SANJAY GANDHI POSTGRADUATE INSTITUTE OF MEDICAL SCIENCES, LUCKNOW, INDIA	JULY 1995-JUNE 1996
SENIOR RESIDENT-(FELLOW LEVEL), GENERAL ANESTHESIOLOGY	SANJAY GANDHI POSTGRADUATE INSTITUTE OF MEDICAL SCIENCES, LUCKNOW, INDIA	JUNE 1994-JULY 1995
RESIDENT, ANESTHESIOLOGY	POST GRADUATE INSTITUTE OF MEDICAL EDUCATION & RESEARCH, CHANDIGARH	JANUARY 1991 - DECEMBER 1993
MEDICAL SCHOOL, INCLUDES INTERNSHIP	MADRAS MEDICAL COLLEGE, CHENNAI, INDIA	SEPTEMBER 1984- MARCH 1990

COMMITTEE APPOINTMENTS

- Co- Chair, Trainee engagement Sub-Committee, SNACC 2017 to current
- Member, Education committee, Society of neurosciences in anesthesiology and critical care (SNACC) 2014 to current.
- Member, Program evaluation committee, Cleveland clinic residency 2018.
- Member, ASA committee 2017 - Abstract grading of clinical neurosciences.
- Member, SEA 2016 - Technology in advancement of education.
- Associate editor of neuroanesthesia section, Anesthesia tool box- National anesthesia curriculum establishment, 2015

EDITORIAL COMMITTEES

- Reviewer for neuroanesthesia section of anesthesia tool box
- Reviewer Journal of neurosurgical anesthesiology

GRANTS

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.

AWARDS

Second prize- Residents research day presentation- Factors predicting renal failure after partial nephrectomy-Cleveland Clinic 2014

Third prize- Midwest anesthesia resident's conference- "Awake craniotomy-An analysis of intraoperative management" - Podium presentation - MARC 2010.

Silver medal (certificate of first order) in the final M.D (Anesthesiology) exam (India)- Postgraduate Institute of medical education and research, Chandigarh, India.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

1. American Society of Anesthesiologists
2. IARS
3. Society of Neurosurgical anesthesiology and critical care
4. Society of education in anesthesia
5. Indian Medical association
6. Indian society of Anesthesiologists

CERTIFICATIONS/EXAMINATIONS

Program Director Certification course- Cleveland clinic 2017

Foundations of FLEX program (Leadership program for women offered by case Western Reserve University)

ABA Anesthesiology - Written 2014

ABA Anesthesiology - Oral Boards 2015

TEE Basic exam - 2014

M.D (Anesthesiology) India - 1993

PDCC (Post-Doctoral Certificate Course Cardiac Anesthesia) - 1996

USMLE Step 1 Score 241, 99 Percentile - 2007

USMLE Step 2 Score 269, 99 Percentile - 2008

USMLE Step 3 Score 237, 99 Percentile - 2009

USMLE Step 2 CS - Pass- 2008

TEACHING ACTIVITIES- CLEVELAND CLINIC

- Neuroanesthesia rotation residency curriculum development- Cleveland clinic – Web based platform.
- PACU educational curriculum development- Cleveland clinic.
- Conduct Neuroanesthesia PBLDs during neuro rotation(monthly)
- Organize general anesthesia PBLDs for residents during Gena rotation(Weekly)
- Conduct Journal clubs in neuroanesthesia(every two months)
- Organize Journal clubs in general anesthesia with dinner for the department (Quarterly).

TEACHING ACTIVITIES – OUTSIDE OF CLEVELAND CLINIC

- Moderator in ASA 2015/2016/2017 - Session on medically challenging case poster presentations.
- Neuroanesthesia quiz- Team leader for the quiz group (**monthly** publication at the SNACC website).
- Residents and fellows audio corner- SNACC (every **two months**)
- Bibliography SNACC Website (**yearly** contribution) – Multimodal analgesia for spine surgery, Enhanced recovery pathways, Hypoxemic ischemic encephalopathy).

- Remote Neuroanesthesia Quiz for Albany medical center residents on ZOOM app.

PRESENTATIONS & WORKSHOPS

- IARS meeting 2018, May, Chicago, PBLD Anesthesia for acute stroke- Updates in management
- IARS meeting 2018, May, Chicago, Hosted Dine around meeting, Adverse Neurologic effects of surgery and anesthesia.
- SEA meeting, Louisville, April 2018, Learning management systems, Workshop leader.
- SEA meeting, Louisville, April 2018, Poster "A survey on attitudes regarding neuroanesthesia fellowship amongst attending anesthesiologists, fellows and residents"
- Comprehensive anesthesia review 2018- Board review session presenter. Cleveland Clinic, March 2018
- Dexmedetomidine for post-craniotomy pain, Experts audio corner, SNACC education, Feb 2018, <http://www.snacc.org/experts-audio/>
- PBLD – Enhanced recovery pathways for spine surgery, , ISNACC Jan 2018, Mumbai, India
- Quiz master for residents and fellows in neuroanesthesia at the ISNACC(Indian society of neuroanesthesia and critical care) Jan 2018, Mumbai, India
- Faculty at Workshop on Neuromonitoring, Cerebral oximetry, ISNACC Jan 2018, Mumbai, India
- Faculty presenter at the SNACC, Boston October 2017- Neuroanesthesia review fun- Interactive quiz session.

- A survey on attitudes regarding neuroanesthesia fellowship amongst attending anesthesiologists, fellows and residents. SNACC, Boston October, 2017
- PBLD- ASA, Boston October 2017- Anesthesia for spine surgery- Emerging trends and enhanced recovery pathways.
- PBLD session in IARS 2017- D.C- Anesthesia for stroke- considerations and controversies.
- Fair use of copyright- Workshop at SEA, spring 2017 - workshop facilitator.
- Interactive neuroanesthesia curriculum through a learning platform – SEA poster presentation spring 2017.
- Anesthesia for MRI procedures- Comprehensive anesthesia review course- Cleveland clinic 2017 March
- Regional anesthesia for the airway- Comprehensive anesthesia review- Cleveland clinic 2017 March
- Anesthesia for neuromuscular disorders- Comprehensive anesthesia review - Cleveland clinic 2017 March
- Moderated session on " Anesthesia and co-existing diseases"- Comprehensive anesthesia review- Cleveland clinic 2017 March
- Just another spine surgery; but my patient is on chronic pain medications- Enhanced recovery pathways- A paradigm shift. ASA 2016.
- Invited lectures in India ISNACC Feb 2017-
 - a. Anesthesia for Deep brain stimulation for Parkinson's disease
 - b. Brain tissue oxygen tension monitoring
- Survey of strategies used for neuromonitoring and neuroprotection in an academic center. SNACC 2016 Poster
- Neuromonitoring and identification of potential peripheral nerve injury caused by positioning- SNACC- 2015
- Congenital and acquired cervical spine disorders in pediatric patients producing a difficult airway- mentor for resident presentation- SNACC 2015
- Anesthesia for Von Hippel Lindau disease- SNACC 2015

- Comparison of intraoperative albumin + crystalloid versus crystalloid alone on postoperative complications after Non cardiac surgery- oral presentation- ASA 2015.
- Dexmedetomidine provides better PACU hemodynamic control and reduces PACU analgesic requirements than remifentanyl in intracranial tumor excision- a randomized control trial-SNACC and ASA 2014
- Perioperative factors predicting acute kidney injury after partial nephrectomy. ASA 2014.
- Retrograde aortic dissection in thoracic aortic aneurysm repair- MARC 2014.
- Simulation for education in neuroanesthesia-Poster presentation-2013 SNACC
- An overenthusiastic pacemaker- Poster presentation- Ohio state of anesthesiology conference 2012 and ASA 2012.
- Factors predicting intraoperative hypertension during deep brain stimulation In Parkinson's disease- 2012 SNACC & ASA
- Dexmedetomidine for awake craniotomy-A comparison with general anesthesia for supratentorial tumors- SNACC & ASA 2011
- Poster-Awake versus Asleep Craniotomy for Brain tumors- Presentation at Society of Neurosurgical Anesthesiology-2010
- Dexmedetomidine for awake craniotomy-A comparison with general anesthesia for supratentorial tumors- Ohio State of anesthesiology conference 2010.
- Podium presentation- Awake Craniotomy-An analysis of intraoperative management- Midwest anesthesia residents conference- 3rd prize-Midwest anesthesia resident's conference-2010
- Pathophysiology of Respiratory failure; Talk in CME on Mechanical Ventilation, 2003, June, Chennai India
- Moderation of Seminar on Labor analgesia in CME-RACE(Ramachandra anesthesia continuing education) 2000, Chennai, India
- Labor Analgesia-Trials, Tribulations, triumphs, at the 4th South Asian Congress of Anesthesiology at Chennai, India in 1999.
- Optimal Tidal volume: Indian society of Anesthetists, UP Chapter, India, 1995.

- Oculocardiac reflex; poster presentation; Conference of the Indian Society of anesthesiologists; Bangalore, India, 1993.

MENTEES

Rachel Diehl- First prize MARC, Chicago, April 2018- Case presentation, LVAD patient for Bariatric surgery.

Krysten Rothstein – Third Prize MARC Chicago, April 2018 - Pregnancy with AVM in the brain

Sanchit Ahuja M.D- outcomes research fellow- mentor for his presentation, Preoperative ACE inhibitors and perioperative stroke prevention (Retrospective Study) ; SNACC 2017.

Wael Saassouh- Mentor for his presentation on Awake craniotomy in the IMRIS suite- IARS 2017

Rachel Diehl - Anesthesia for bariatric surgery in a patient with LVAD- ASA 2017- poster- Rachel Diehl, Shobana Rajan

Jazelle Mealing, M.D- Mentor for presentation in the SNACC meeting 2015 -Resident in anesthesiology, Albany medical center, New York- CA-2 year

Mentor for high school students - Padua high school; Medtrack program- Parma- Ohio

PEER REVIEWED PUBLICATIONS

1. 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.

2. Komatsu R, Yilmaz HO, You J, Bashour CA, **Rajan S**, Soltesz EG, Sessler DI, Turan A.

Lack of Association between Preoperative Statin Use and Respiratory and Neurologic Complications after Cardiac Surgery.

Anesthesiology. 2017 Feb 16.

3. Nada EM, **Rajan S**, Grandhe R, Deogaonkar M, Zimmerman NM, Ebrahim Z, Avitsian R.

Intraoperative Hypotension during Second Stage of Deep Brain Stimulator Placement: Same Day versus Different Day Procedures.

World Neurosurg. 2016 Nov;95:40-45.

4. **Rajan S**, Hutcherson MT, Sessler DI, Kurz A, Yang D, Ghobrial M, Liu J, Avitsian R.

The Effects of Dexmedetomidine and Remifentanyl on Hemodynamic Stability and Analgesic Requirement After Craniotomy: A Randomized Controlled Trial.

J Neurosurg Anesthesiol. 2016 Oct;28(4):282-90.

5. **Rajan S** et al; Perioperative Factors Associated with Acute Kidney Injury after Partial Nephrectomy.**Br J Anaesth.** 2016 Jan; 116(1):70-6.

6. **Rajan S**, et al; Comparison of 2 resident learning tools interactive

Screen-based simulated case scenarios versus problem-based learning discussions: a prospective quasi crossover cohort study. **J Clin Anesth.** 2016 Feb; 28: 4-11.

7. **Rajan S**, Sonny A, Sale S. **A A Case Rep.** 2015 Mar 1; 4(5):58-60. Retrograde type A aortic dissection after Thoracoabdominal aneurysm repair: early diagnosis with Intraoperative transesophageal echocardiography. PMID: 25730411

8. **Rajan S**, Deogaonkar M, Kaw R, Nada EM, Hernandez AV, Ebrahim Z, Avitsian R. Factors predicting incremental administration of antihypertensive boluses during deep brain stimulator placement for Parkinson's disease. **J Clin Neurosci.** 2014 Oct; 21(10):1790-5.

9. **Rajan S**, Cata JP, Nada E, Weil R, Pal R, Avitsian R; Asleep-awake-asleep craniotomy: a comparison with general anesthesia for resection of supratentorial tumors. **J Clin Neurosci.** 2013 Aug; 20(8):1068-73.

10. Kaushik.S, **Rajan.S**, Optimal Tidal volume during IPPV; **Indian Journal of Anesthesia** 1998, Jun, 42 (3): 23-6.

11. Grover VK, Bhardwaj N, **Shobana N**, Grewal SP. Oculocardiac reflex during retinal surgery using peribulbar block and nitrous narcotic anesthesia. **Ophthalmic Surg Lasers.** 1998 Mar; 29 (3):207-12.

12. Agarwal A, **Shobhana N.** LMA in neurosurgery.Can J Anaesth. 1995 Aug; 42(8):750. (Letter to the Editor)

13. Agarwal A, **Rajan S.** The LMA in intracranial aneurysm surgery. Can J Anesth. 1995 Dec; 42(12):1176-7. Letter to the Editor.

14. Grover VK, Bhardwaj N, **Shobana N**, Grewal SP. Oculocardiac reflex--peribulbar block or opioid-relaxant anesthesia. Can J Anesth. 1998 Jul; 45(7):706. (Letter to the Editor)

NON-PEER REVIEWED PUBLICATIONS

1. Pregnancy Complicated By a Symptomatic Posterior Fossa Arteriovenous Malformation – Clinical Decision Making and Dilemmas: A Case Report
Shobana Rajan, MD; Christopher J. Yontz, DO; Gargi Banerjee, MD; and Karen Steckner, MD, SNACC Newsletter, Spring edition, 2018.
2. Clinical dilemmas in a patient with heparin allergy in the neurointerventional suite.
SNACC newsletter- winter edition 2017
3. Neuroanesthesia fellowships from the perspective of trainees SNACC newsletter- Summer edition-2013
4. Neuromonitoring case- seizures in awake craniotomy- education corner: SNACC newsletter; Winter 2014.
5. Making sense of external ventricular drainage; Article published in "Anesthesia tool box"- an electronic resource for anesthesia resident education.

BOOKS

1. Rajan and Straker's general anesthesia- A PBLD based book- Editor; to be published in October 2018. Oxford publishers.
2. Beginning work on a neuroanesthesia PBLD based book - Springer publishers

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, garage Banerjee, Kevin Piepsney. *Anesthesia in a patient with liver disease*. (Not yet published)
7. Anesthesia and geriatric diseases in Neuroanesthesia - Shobana Rajan, Adriana Martin. *Parkinson's disease* (Not yet published).

FUTURE GOALS

My future goals are to support residency education particularly neuroanesthesia education by going beyond traditional approaches and developing innovative strategies of teaching using newer technological tools, promoting professionalism, well-being, and leadership skills. I have special interest in enhanced recovery protocols, pain management after craniotomy and spine surgery. awake craniotomy and functional neurosurgery, incorporating point of care ultrasound in perioperative care and will be working on these areas.

I would strive to increase resident involvement with neuroanesthesia and the SNACC so that they can contribute to its bright future.