

## Curriculum Vitae

### **Name:**

Manish, N, Shah, MD

### **Present Title:**

Assistant Professor, Departments of Pediatric Surgery and Neurosurgery,  
Director of Pediatric Spasticity and Movement Disorder Surgery  
Director, Texas Comprehensive Spasticity Center

### **Business Address:**

University of Texas Health Science Center at Houston  
Department of Pediatric Surgery  
Division of Pediatric Neurosurgery  
6431 Fannin Street, Suite 5.144  
Houston, Texas 77030  
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Manish.N.Shah@uth.tmc.edu

### **Undergraduate Education:**

1998 - 2002                      Princeton University, Princeton, New Jersey, A.B., Physics

### **Graduate Education:**

2002 - 2006                      Vanderbilt University, Nashville, Tennessee, M.D., Medicine

### **Postgraduate Training:**

2006 – 2007                      Intern in General Surgery, Washington University, St. Louis,  
Missouri, Mary Klingensmith  
2007 – 2013                      Resident in Neurological Surgery, Washington University, St.  
Louis,  
Missouri, Gregory Zipfel  
2013 – 2014                      Fellow in Pediatric Neurosurgery, Washington University, St.  
Louis,  
Missouri, Tae Sung Park

### **Academic and Administrative Appointments:**

#### **Academic:**

2014 – Present                      Assistant Professor University of Texas Health Science  
Center at Houston

2014 – Present      Assistant Professor, Neurosurgery, University of Texas MD  
Anderson Cancer Center

2014 – Present      Pediatric Neurosurgeon, Texas Women’s Hospital

2014 – Present      Pediatric Neurosurgeon, Shriners’s Hospital for Children  
2015 – Present      Director of Pediatric Spasticity and Movement Disorder  
Surgery at The University of Texas Health Science Center  
at Houston, Mischer Neuroscience Institute, and Children’s  
Memorial Hermann Hospital

**Administrative:**

2014 – Present      Pediatric Surgery OR Safety Simulation Committee

2015 - Present      Pediatric Surgery Billing and Compliance Committee

**Other Appointments/Responsibilities:**

2010 – 2011      Implemented “The Management of New Onset Diabetes  
Insipidus after Transsphenoidal Surgery” as a Residency QI  
project, Washington University Dept. of Neurosurgery

2010 – 2011      Designed and implemented “NSList”, a secure, web-based,  
neurosurgical informatics system for patient-care,  
Washington University Department of Neurosurgery

**Hospital Appointments:**

Memorial Hermann Hospital, Texas Medical Center, 2014-present

Children’s Memorial Hermann Hospital, 2014-present

Shriners’s Children’s Hospital, 2014-present

MD Anderson Cancer Center, 2014-present

Texas Woman’s Hospital, 2014-present

**Licensure:**

**Active:**

Texas, P9955, issued – 4/2014, expiring – 5/2019

Missouri, 2011001500, issued – 2/1/2011, expiring – 1/31/2017

**Inactive:**

None

**Certifications:**

American Board of Neurological Surgery, Primary Examination

American Board of Neurological Surgery, Diplomat

American Board of Pediatric Neurological Surgery

American Board of Surgery – General Surgery

Pediatric Advanced Life Support

**Professional Organizations:**

**Local:**

Harris County Medical Society, 2014-present

Harris County Pediatric Society, 2014-present

**Regional:**

2015 – Present Texas Epilepsy Foundation, Professional Advisory Board Member

**National:**

2005 – Present Alpha Omega Alpha, Vanderbilt University School of Medicine Chapter, Life Member

2007 – Present American Association of Neurological Surgeons, Member

2009 – Present AANS/CNS Joint Pediatrics Section, Member

2010 – Present AANS/CNS Joint Cerebrovascular Section, Member

**Honors and Awards:**

1998 – 2002 Robert Byrd Honors Scholarship

1998 – 2002 Garden State Scholarship

2002 Election to Sigma Xi Scientific Research Honor Society

2005 Election to Alpha Omega Alpha Medical Honor Society

2006 John C. Coniglio Biochemistry Research Prize

2006 Tom Nesbitt Prize in Organized Medicine

2009 Department of Neurosurgery Annual Resident Research Symposium Research Award

2010 Department of Neurosurgery Medical Student Teaching Award

2012 AANS 2012 Meeting, Miami, FL – First Prize Pediatrics Poster Presentation

**SERVICE ON THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT HOUSTON COMMITTEES:**

Faculty Senate, Pediatric Surgery Representative, 9/2015- Present

**SERVICE ON THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON COMMITTEES:**

Pediatric Surgery OR Safety Simulation Committee, 8/2014-6/2015

Pediatric Surgery Billing and Compliance Committee, 1/2015- Present

**Service to the Community:**

**Volunteer Neurosurgical Medical Trips Abroad:**

- 2011 Performed pediatric endoscopic third ventriculostomies and ventriculoperitoneal shunts with Drs. David Limbrick and Keith Rich, Project Medishare Neurosurgical Mission, Port-au-Prince, Haiti
- February 2014 Performed pediatric endoscopic third ventriculostomies and ventriculoperitoneal shunts with Drs. David Limbrick and Keith Rich, Project Medishare Neurosurgical Mission, Port-au-Prince, Haiti
- December 2014 Performed pediatric endoscopic third ventriculostomies and ventriculoperitoneal shunts with Drs. David Limbrick and Keith Rich, Project Medishare Neurosurgical Mission, Port-au-Prince, Haiti, May 2011 and February 2014 and now as an attending at UT Houston with David Sandberg in December 2014 and December 2015

**MENTORING ACTIVITIES:**

Neuroscience Scholarly Concentration Faculty Mentor for UTH Medical Student: Tahseen Karim

Laboratory Mentor for UTH Medical Student: Joseph Herbert Laboratory Mentor for UTH Medical Student: Sidish Venkataraman

**CURRENT CLINICAL SERVICE RESPONSIBILITIES:**

Pediatric Neurosurgeon, on-call every 3rd night for Children's Memorial Hermann Hospital

Pediatric Neurosurgeon, MD Anderson Cancer Center

Pediatric Neurosurgeon, Shriners' Children's Hospital

Pediatric Neurosurgeon, Texas Woman's Hospital

**CURRENT GRANT SUPPORT:**

"Cortical Plasticity in Spastic Diplegic Children after Selective Dorsal Rhizotomy", PI – Manish N. Shah, NICHD, NICHD L30 HD089125, 7/2016-6/2018, loan repayment program

"Pediatric Functional Brain Optical Imaging," PI – Manish N. Shah, MHH Foundation, 2015 – Present

"Cortical Plasticity in Pediatric Spastic Diplegia after Selective Dorsal Rhizotomy," PIManish N. Shah, MHH Foundation, 2014-present

**Past Grant Support:**

2010 – 2011      Functional Connectivity in Pediatric Epilepsy, PI – Manish N. Shah, NIH NST32007205, 2010-2011, Advisor: Professor Marcus Raichle at Washington University in St. Louis

**Publications:**

A. Abstracts

1. **Shah MN**, Leonard JR, Inder G, Gao F, Geske M, Haydon DH, Omodon ME, Evans J, Morales D, Dacey RG, Smyth MD, Chicoine MR, Limbrick DD. "Intraoperative magnetic resonance imaging reduces the rate of early reoperation for lesion resection in pediatric neurosurgery." Poster at 80th American Association of Neurological Surgeons Annual Meeting: April 2012, Miami, FL.
2. Fu K, Barr R, Kerr M, **Shah MN**, Fletcher S, Sandberg D, Teichgraeber J, Greives MR. An outcomes comparison between autologous and alloplastic cranioplasty in the pediatric population. Housestaff Research Day University of Texas Health Sciences Center at Houston, May 2015.
3. Barr R, **Shah MN**, Teichgraeber J, Greives MR. Cervical instability in Pierre Robin Sequence: an Addition to the Algorithm. Texas Society of Plastic Surgeons, San Antonio, TX, September 2015.
4. Fu K, Barr R, Kerr M, **Shah MN**, Fletcher S, Sandberg D, Teichgraeber J, Greives MR. An outcomes comparison between autologous and alloplastic cranioplasty in the pediatric population. Texas Society of Plastic Surgeons, San Antonio, TX, September 2015.
5. Greives MR, Fu K, Barr R, Kerr M, **Shah MN**, Fletcher S, Sandberg D, Teichgraeber J, An outcomes comparison between autologous and alloplastic cranioplasty in the pediatric population. International Society of Craniofacial Surgery, Tokyo, Japan, September 2015.
6. **Shah MN**, Mitra A, Goyal MS, Snyder AZ, Shimony JS, Limbrick DD, Raichle ME, Smyth MD. "Functional Connectivity Signal Latency Predicts Laterality in Pediatric Medically-Refractory Temporal Lobe Epilepsy." NeuroRegeneration Collaborative Symposium, Houston, TX, September 2015.
7. Venkataraman SS\*, Herbert JP\*, Turkmani AH, Kerr ML, Greives MR, Fletcher SA, Sandberg DI, Cox CS, Kitagawa RS, Day AL, **Shah MN**. "Pediatric Blunt Cerebrovascular Injury: the McGovern Experience." Poster Presentation at AANS/CNS Pediatric Neurological Surgery Meeting: December 2016, Orlando, FL.
8. Martinez CL, Fletcher S, Shah MN, Kerr M, **Sandberg DI**. "Survey of Techniques Used to Access Ventricular Shunts and Reservoirs." Poster Presentation at AANS/CNS Pediatric Neurological Surgery Meeting: December 2016, Orlando, FL.

B. Refereed Original Articles in Journals

1. Berger M, Castelino J, Huang R, **Shah M**, Austin RH. Design of a microfabricated magnetic cell separator, Electrophoresis. 2001(18):3883-92.

2. Brown JM, **Shah MN**, Mackinnon SE. Distal nerve transfers: a biology-based rationale. *Neurosurg Focus*. 2009 Feb;26(2):E12.
3. Zipfel GJ, **Shah MN**, Refai D, Dacey RG Jr, Derdeyn CP. Cranial dural arteriovenous fistulas: modification of angiographic classification scales based on new natural history data. *Neurosurg Focus*. 2009 May;26(5):E14.
4. **Shah MN**, Leonard J, Perry A. Rosette Forming Glioneuronal Tumors of the Posterior Fossa: Report of 6 Cases. *J Neurosurg Pediatrics*. 2010 Jan;5(1):98-103.
5. Leuthardt EC, Lim CC, **Shah MN**, Evans JA, Rich KM, Dacey RG, Tempelhoff R, Chicoine MR. Use of movable high-field-strength intraoperative magnetic resonance imaging with awake craniotomies for resection of gliomas: preliminary experience. *Neurosurgery*. 2011 Jul;69(1):194-205; discussion 205-6.
6. **Shah MN**, Petersen JD, Naidoo S, Woo AS, Kane AA, Smyth MD. "The St. Louis Children's Hospital Experience with Endoscopically-assisted Sagittal Synostosis Repair." *J Neurosurg Pediatr*. 2011 Aug;8(2):165-70.
7. Pizoli CE\*, **Shah MN\***, Snyder AZ, Shimony JS, Limbrick DD, Raichle ME, Schlaggar BL, Smyth MD. "The Role of Resting State Functional Activity in Human Brain Development."
8. **Shah MN**, Leonard JR, Inder G, Gao F, Geske M, Haydon DH, Omodon ME, Evans J, Morales D, Dacey RG, Smyth MD, Chicoine MR, Limbrick DD. Intraoperative magnetic resonance imaging to reduce the rate of early reoperation for lesion resection in pediatric neurosurgery. *J Neurosurg Pediatr*. 2012 Mar;9(3):259-64.
9. **Shah MN**, Botros J, Pilgram T, Moran CJ, Cross DT, Chicoine MR, Rich KM, Dacey RG, Derdeyn CP and Zipfel GJ. "Borden-Shucart Type I dural arteriovenous fistulas: clinical course including risk of conversion to higher-grade fistulas." *J Neurosurg*. 2012 Sep;117(3):539-45.
10. **Shah MN**, Stoev IT, Sanford DE, Gao F, Santiago P, Jaques DP, Dacey RG. "Are readmission rates on a neurosurgical service indicators of quality of care?" *J Neurosurg*. 2013 Oct;119(4):1043-9.
11. Vellimana AK, Daniels DJ, **Shah MN**, Zipfel GJ, Lanzino G. "Dural arteriovenous fistulas associated with benign meningeal tumors." *Acta Neurochir (Wien)*. 2014 Mar;156(3):535-44.
12. Zuckerman SL, Eli IM, **Shah MN**, Bradley N, Stutz CM, Park TS, Wellons JC 3rd. Radial to axillary nerve neurotization for brachial plexus injury in children: a combined case series. *J Neurosurg Pediatr*. 2014 Sep 5:1-9.

13. Sanford DE, Olsen MA, Bommarito KM, **Shah M**, Fields RC, Hawkins WG, Jaques DP, Linehan DC. "Association of discharge home with home health care and 30-day readmission after pancreatectomy," J Am Coll Surg. 2014 Nov;219(5):875-86.e1.
14. Fakhri A1, **Shah MN**, Goyal MS. "Advanced Imaging of Chiari 1 Malformations." Neurosurg Clin N Am. 2015 Oct;26(4):519-26.
15. Fu KJ, Barr RM, Kerr ML, **Shah MN**, Fletcher SA, Sandberg DI, Teichgraeber JF, Greives MR. "An Outcomes Comparison Between Autologous and Alloplastic Cranioplasty in the Pediatric Population." J Craniofac Surg. 2016 May;27(3):593-7.
16. Zhu B, **Shah MN**, Godavarty A, Sevick A, "Brain connectivity in joint attention skills and an intensified CCD camera based NIRS and imaging system," in *Biomedical Optics 2016*, OSA Technical Digest (online) (Optical Society of America, 2016), paper JW3A.52.
17. Barr RM, Khan SA, **Shah MN**, Roy S, Teichgraeber JF, Greives MR. "Cervical Instability in Pierre Robin Sequence: An Addition to the Algorithm." J Craniofac Surg. 2016 Jul 19.
18. **Shah MN\***, Smith SE\*, Dierker DL, Herbert JP, Coalson TS, Bruck BS, Zipfel GJ, Van Essen DC, Dacey RG. The relationship of cortical folding and brain arteriovenous malformations. Neurovascular Imaging. 2016 November 22; 2(1):13. **\*Co-first author**

C. Invited Articles (Reviews, Editorials, etc.) in Journals

D. Chapters

1. **Shah MN** and Santiago P. "Congenital and Acquired Abnormalities of the Thoracic and Lumbar Spine," Chapter 290 in Youmans: Neurological Surgery. Ed: Winn RE, 2011.

E. Books

F. Other Professional Communications

1. Presentations (by local, regional, national, international)

# Curriculum Vitae

November 22, 2017

## Local:

1. "Surgical Management of Pediatric Spasticity and Dystonia," Grand Rounds, Department of Pediatrics, University of Texas Health Science Center, Houston, September 2014
2. "The Surgical Treatment of Pediatric Spasticity," Grand Rounds, Department of Neurology, University of Texas Health Science Center, Houston, March 2015
3. "Advanced MR imaging in Pediatric Neurosurgical Disease," Grand Rounds, Department of Neurosurgery, University of Texas Health Science Center, Houston, May 2015
4. "Update on Pediatric Spasticity Management," 2015 Pediatric Neuroscience Symposium, Children's Memorial Hermann Hospital, Houston, May 2015.
5. "Update on Epilepsy Surgery," 2015 Pediatric Neuroscience Symposium, Children's Memorial Hermann Hospital, Houston, May 2015.
6. "Neurosurgical Options to Treat Epilepsy in Children," 2016 Pediatric Neuroscience Symposium, Children's Memorial Hermann Hospital, Houston, May 2016.
7. "Management of Spasticity in Children," 2016 Pediatric Neuroscience Symposium, Children's Memorial Hermann Hospital, Houston, May 2016.

## International:

1. **Shah MN**, Lee A, Petersen JD, Naidoo S, Woo AS, Kane AA, Smyth MD. "The St. Louis Children's Hospital Experience with Endoscopically-assisted Sagittal Synostosis Repair." Oral presentation at AANS/CNS Joint Section of Pediatric Neurosurgery: Annual Meeting - 11/2010, Cleveland, OH.
2. **Shah MN**, Botros JA, Pilgram TK, Moran CJ, Cross DT III, Chicoine MR, Rich KM, Dacey RG Jr, Derdeyn CP, Zipfel GJ. "Cranial Dural Arteriovenous Fistulas without Cortical Venous Drainage: Natural History including Rate of Conversion to High Grade Fistula with Cortical Venous Drainage." Oral presentation at International Stroke Conference: February 2011, Los Angeles, CA.
3. **Shah MN**, Snyder AZ, Shimony JS, Limbrick DD, Raichle ME, Smyth MD. "Functional Connectivity Changes in Pediatric Medically-Refractory Temporal Lobe Epilepsy." Oral Presentation at AANS/CNS Pediatrics Meeting: December 2013, Toronto, CA.
4. **Shah MN**, Mitra A, Goyal MS, Snyder AZ, Shimony JS, Limbrick DD, Raichle ME, Smyth

## Curriculum Vitae

November 22, 2017

5. MD. "Functional Connectivity Signal Latency Predicts Laterality in Pediatric Medically-Refractory Temporal Lobe Epilepsy." Oral Presentation at American Society of Pediatric Neurosurgeons Meeting: February 2016, Palm Beach, Aruba.
6. **Shah MN**, Zhu B, Sevick EM. "A High-resolution Near-infrared Pediatric Functional Brain Imaging System." Oral Presentation at AANS/CNS Pediatrics Meeting: December 2016, Orlando, FL.
7. Sandberg DI, Patel RP, Kerr ML, Sitton CW., Ketonen LM, Hou P., Johnson JM, **Shah MN**, Fletcher SA, Zaky W, Rytting ME, Khatua S. "Phase-Contrast Cine Cerebrospinal Fluid (CSF) Flow Magnetic Resonance Imaging (MRI) in Evaluating Distribution of Infused Agents from the Fourth Ventricle to the Total Spine." Oral Presentation at AANS/CNS Pediatrics Meeting: December 2016, Orlando, FL.

**Patent:** Washington University St. Louis, MO, Catheter assembly for use with shunt systems and method of using same, US 2013/0131576