



Ashwin Ramayya, MD, PhD

Assistant Professor of Neurosurgery

CLINICAL OFFICE (PRIMARY)

- **Stanford Neuroscience Health Center**

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Bio

BIO

Dr. Ramayya is an assistant professor in the Department of Neurosurgery. He specializes in the treatment of patients with chronic pain, movement disorders, epilepsy, and traumatic brain injury. His research program will focus on understanding brain mechanisms underlying pain experience and how to alleviate pain using brain stimulation.

Dr. Ramayya specializes in neuromodulation, including deep brain stimulation (DBS), spinal cord stimulation, MRI-guided laser therapy, and focused ultrasound. Dr. Ramayya obtained his MD and PhD from the University of Pennsylvania, where he also completed his neurosurgery residency and a fellowship in stereotactic and functional neurosurgery.

His research efforts have identified neural substrates underlying learning, memory, and decision-making using computational behavioral modeling, neurophysiology, and neuroimaging.

Dr. Ramayya has published in numerous peer-reviewed journals, including the Journal of Neuroscience, NeuroImage, and Cerebral Cortex. He has also presented his work at national and international meetings, including those for the American Association of Neurological Surgeons and the Pan Philadelphia Neurosurgery Conference.

CLINICAL FOCUS

- Neurological Surgery

ACADEMIC APPOINTMENTS

- Assistant Professor - University Medical Line, Neurosurgery
- Member, Bio-X
- Member, Wu Tsai Human Performance Alliance
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Neurosurgery Resident Research Presentation Award, Pan Philadelphia
- Dorothea Jameson and Leo M. Hurvich Travel Award, Perelman School of Medicine
- Medical Scientist Training Program Scholarship, National Institutes of Health

PROFESSIONAL EDUCATION

- Fellowship: Pennsylvania Hospital PA
- Residency: Hospital of the University of Pennsylvania (2023) PA
- Medical Education: Perelman School of Medicine University of Pennsylvania (2016) PA

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Salaar Ahmed

Publications

PUBLICATIONS

- **Functional Architecture of the Human Insula Revealed by Causal Intracranial Mapping.** *Research square*
Parvizi, J., Quabs, J., Pantis, S., Chen, G., Huang, W., Ma, E., Del Vecchio, M., Lyu, D., Wang, C., Avanzini, P., Buch, V., Ramayya, A., Caspers, et al
2026
- **Value of Inpatient Neuromodulation: A National Analysis of Paddle Spinal Cord Stimulation Outcomes.** *Neurosurgery*
Jain, B., Abikeniari, M. A., Sadeghzadeh, S., Shah, A., Yoo, K. H., Azad, T. D., Hani, U., Ratliff, J. K., Ramayya, A. G., Veeravagu, A.
2026
- **Naturalistic acute pain states decoded from neural and facial dynamics.** *Nature communications*
Huang, Y., Gopal, J., Kakusa, B., Li, A. H., Huang, W., Wang, J. B., Persad, A., Ramayya, A., Parvizi, J., Buch, V. P., Keller, C. J.
2025; 16 (1): 4371
- **Lower Extremity Somatosensory Evoked Potential (SSEP) Collision Testing for Guidance of Nerve Root Stimulation Placement for Chronic Pain**
Gummi, R., Meyers, N., Keroles, M., Cho, S., Le, S., Lee, L., Tippur, A., Lopez, J., Ramayya, A.
LIPPINCOTT WILLIAMS & WILKINS.2025
- **The Barriers to Neurosurgical Care in The Gambia** *NEUROSURGERY PRACTICE*
Ceesay, O. I., Vaca, S., Gephart, M. H., Park, J. J., Ramayya, A. G.
2025; 6 (1)
- **The Barriers to Neurosurgical Care in The Gambia.** *Neurosurgery practice*
Ceesay, O. I., Vaca, S., Gephart, M. H., Park, J. J., Ramayya, A. G.
2025; 6 (1): e00125
- **Human response times are governed by dual anticipatory processes with distinct neural signatures.** *Communications biology*
Ramayya, A. G., Buch, V., Richardson, A., Lucas, T., Gold, J. I.
2025; 8 (1): 124
- **Return of intracranial beta oscillations and traveling waves with recovery from traumatic brain injury.** *bioRxiv : the preprint server for biology*
Vaz, A., Wathen, C., Miranda, S., Thomas, R., Darlington, T., Jabarkheel, R., Tomlinson, S., Arena, J., Bond, K., Salwi, S., Ajmera, S., Bachschmid-Romano, L., Gugger, et al
2024

- **Rates and Predictors of Pain Reduction With Intracranial Stimulation for Intractable Pain Disorders.** *Neurosurgery*
Huang, Y., Sadeghzadeh, S., Li, A. H., Schonfeld, E., Ramayya, A. G., Buch, V. P.
2024
- **Dichotomous frequency-dependent phase synchrony in the sensorimotor network characterizes simplistic movement.** *Scientific reports*
Buch, V. P., Brandon, C., Ramayya, A. G., Lucas, T. H., Richardson, A. G.
2024; 14 (1): 11933
- **Naturalistic acute pain states decoded from neural and facial dynamics.** *bioRxiv : the preprint server for biology*
Huang, Y., Gopal, J., Kakusa, B., Li, A. H., Huang, W., Wang, J. B., Persad, A., Ramayya, A., Parvizi, J., Buch, V. P., Keller, C.
2024
- **Ethical Issues in Intraoperative Neuroscience Research: Assessing Subjects' Recall of Informed Consent and Motivations for Participation.** *AJOB empirical bioethics*
Wexler, A., Choi, R. J., Ramayya, A. G., Sharma, N., McShane, B. J., Buch, L. Y., Donley-Fletcher, M. P., Gold, J. I., Baltuch, G. H., Goering, S., Klein, E.
2022; 13 (1): 57-66
- **Tractography-Based Surgical Targeting for Thalamic Deep Brain Stimulation: A Comparison of Probabilistic vs Deterministic Fiber Tracking of the Dentato-Rubro-Thalamic Tract.** *Neurosurgery*
Yang, A. I., Parker, D., Vijayakumari, A. A., Ramayya, A. G., Donley-Fletcher, M. P., Aunapu, D., Wolf, R. L., Baltuch, G. H., Verma, R.
2022; 90 (4): 419-425
- **Anticipatory influences on simple sensory-motor behaviors are encoded by rapidly fluctuating neural dynamics across the human brain**
Ramayya, A., Buch, V., Richardson, A., Lucas, T., Gold, J.
bioRxiv.
2022
- **Social Determinants of Health and Neurosurgical Outcomes: Current State and Future Directions.** *Neurosurgery*
Glauser, G., Detchou, D. K., Dimentberg, R., Ramayya, A. G., Malhotra, N. R.
2021; 88 (5): E383-E390
- **Thoracolumbar Transverse Process Fractures Are More Frequently Associated with Nonspinal Injury than Clinically Significant Spine Fracture.** *World neurosurgery*
Arena, J. D., Kvint, S., Ghenbot, Y., Howard, S., Ramayya, A. G., Sinha, S., Petrov, D., Chen, H. I., Schuster, J. M.
2021; 146: e1236-e1241
- **Theta Synchrony Is Increased near Neural Populations That Are Active When Initiating Instructed Movement** *ENEURO*
Ramayya, A. G., Yang, A., Buch, V. P., Burke, J. F., Richardson, A. G., Brandon, C., Stein, J. M., Davis, K. A., Chen, H., Proekt, A., Kelz, M. B., Litt, B., Gold, et al
2021; 8 (1)
- **Surface-Registration Frameless Stereotactic Navigation Is Less Accurate During Prone Surgeries: Intraoperative Near-Infrared Visualization Using Second Window Indocyanine Green Offers an Adjunct.** *Molecular imaging and biology*
Cho, S. S., Teng, C. W., Ramayya, A., Buch, L., Hussain, J., Harsch, J., Brem, S., Lee, J. Y.
2020; 22 (6): 1572-1580
- **Focused Ultrasound Thalamotomy with Dentato-Rubro-Thalamic Tractography in Patients with Spinal Cord Stimulators and Cardiac Pacemakers** *STEREOTACTIC AND FUNCTIONAL NEUROSURGERY*
Buch, V. P., McShane, B. J., Beatson, N., Yang, A., Blanke, A., Tilden, D., Korn, M., Chaibainou, H., Ramayya, A., Wombacher, K., Maier, S., Marashlian, T., Wolf, et al
2020; 98 (4): 263-269
- **Thalamic Deep Brain Stimulation for Essential Tremor: Relation of the Dentatorubrothalamic Tract with Stimulation Parameters** *WORLD NEUROSURGERY*
Yang, A., Buch, V. P., Heman-Ackah, S. M., Ramayya, A. G., Hitti, F. L., Beatson, N., Chaibainou, H., Yates, M., Wang, S., Verma, R., Wolf, R. L., Baltuch, G. H.
2020; 137: E89-E97
- **Association of spinal instability due to metastatic disease with increased mortality and a proposed clinical pathway for treatment.** *Journal of neurosurgery. Spine*

- Sullivan, P. Z., Albayar, A., Ramayya, A. G., McShane, B., Marcotte, P., Malhotra, N. R., Ali, Z. S., Chen, H. I., Janjua, M. B., Saifi, C., Schuster, J., Grady, M. S., Jones, et al
2020: 1-8
- **Single neurons throughout human memory regions phase-lock to hippocampal theta**
Schonhaut, D., Ramayya, A., Solomon, E., Herweg, N., Fried, I., Kahana, M.
bioRxiv.
2020
 - **Association of Overlapping Neurosurgery With Patient Outcomes at a Large Academic Medical Center.** *Neurosurgery*
Agarwal, P., Ramayya, A. G., Osiero, B., Goodrich, S., Glauser, G., McClintock, S. D., Chen, H. I., Schuster, J. M., Grady, M. S., Malhotra, N. R.
2019; 85 (6): E1050-E1058
 - **Association of Surgical Overlap during Wound Closure with Patient Outcomes among Neurological Surgery Patients at a Large Academic Medical Center.** *Neurosurgery*
Glauser, G., Agarwal, P., Ramayya, A. G., Chen, H. I., Lee, J. Y., Schuster, J. M., Osiero, B., Goodrich, S., Smith, L. J., McClintock, S. D., Malhotra, N. R.
2019; 85 (5): E882-E888
 - **Assessing the utility of an IoS application in the perioperative care of spine surgery patients: the NeuroPath Pilot study.** *mHealth*
Glauser, G., Ali, Z. S., Gardiner, D., Ramayya, A. G., Pessoa, R., Grady, M. S., Welch, W. C., Zager, E. L., Sim, E., Haughey, V., Wells, B., Restuccia, M., Tait, et al
2019; 5: 40
 - **Surgical Management of Idiopathic Thoracic Spinal Cord Herniation.** *World neurosurgery*
Neale, N., Ramayya, A., Welch, W.
2019; 129: 81-84
 - **Assessing variability in surgical decision making among attending neurosurgeons at an academic center.** *Journal of neurosurgery*
Ramayya, A. G., Chen, H. I., Marcotte, P. J., Brem, S., Zager, E. L., Osiero, B., Piazza, M., Sharma, N., McClintock, S. D., Schuster, J. M., Ali, Z. S., Connolly, P., Heuer, et al
2019; 132 (6): 1970-1976
 - **Factors Predicting Ventriculostomy Revision at a Large Academic Medical Center** *WORLD NEUROSURGERY*
Ramayya, A. G., Glauser, G., Mcshane, B., Branche, M., Sinha, S., Kvint, S., Buch, V., Abdullah, K. G., Kung, D., Chen, H., Malhotra, N. R., Ozturk, A.
2019; 123: E509-E514
 - **Long-term outcomes following deep brain stimulation for Parkinson's disease.** *Journal of neurosurgery*
Hitti, F. L., Ramayya, A. G., McShane, B. J., Yang, A. I., Vaughan, K. A., Baltuch, G. H.
2019: 1-6
 - **Epilepsy: Temporal Lobectomy with Invasive Monitoring** *Functional Neurosurgery: The Essentials.*
Ramayya, A., Baltuch, .
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 - **Globus Pallidus Interna Deep Brain Stimulation: Practical Guide to Placement with Microelectrode Recording** *Surgery for Parkinson's Disease*
Hudgins, E., Baltuch, A.
2019
 - **Reduced long-term cost and increased patient satisfaction with rechargeable implantable pulse generators for deep brain stimulation.** *Journal of neurosurgery*
Hitti, F. L., Vaughan, K. A., Ramayya, A. G., McShane, B. J., Baltuch, G. H.
2018; 131 (3): 799-806
 - **Neurologic Status on Presentation as Predictive Measurement in Success of Closed Reduction in Traumatic Cervical Facet Fractures.** *World neurosurgery*
Branche, M. J., Ozturk, A. K., Ramayya, A. G., McShane, B. J., Schuster, J. M.
2018; 114: e344-e349

- **A Retrospective Propensity Score-Matched Early Thromboembolic Event Analysis of Prothrombin Complex Concentrate vs Fresh Frozen Plasma for Warfarin Reversal Prior to Emergency Neurosurgical Procedures.** *Neurosurgery*
Agarwal, P., Abdullah, K. G., Ramayya, A. G., Nayak, N. R., Lucas, T. H.
2018; 82 (6): 877-886
- **Posterior Cervical Laminectomy Results in Better Radiographic Decompression of Spinal Cord Compared with Anterior Cervical Discectomy and Fusion.** *World neurosurgery*
Piazza, M., McShane, B. J., Ramayya, A. G., Sullivan, P. Z., Ali, Z. S., Marcotte, P. J., Welch, W. C., Ozturk, A. K.
2018; 110: e362-e366
- **Stimulation of the human medial temporal lobe between learning and recall selectively enhances forgetting.** *Brain stimulation*
Merkow, M. B., Burke, J. F., Ramayya, A. G., Sharan, A. D., Sperling, M. R., Kahana, M. J.
2017; 10 (3): 645-650
- **Thirty-Day Readmission Rates Following Deep Brain Stimulation Surgery.** *Neurosurgery*
Ramayya, A. G., Abdullah, K. G., Mallela, A. N., Pierce, J. T., Thawani, J., Petrov, D., Baltuch, G. H.
2017; 81 (2): 259-267
- **Proximity of Substantia Nigra Microstimulation to Putative GABAergic Neurons Predicts Modulation of Human Reinforcement Learning.** *Frontiers in human neuroscience*
Ramayya, A. G., Pedisich, I., Levy, D., Lyalenko, A., Wanda, P., Rizzuto, D., Baltuch, G. H., Kahana, M. J.
2017; 11: 200
- **Operative Strategies to Minimize Complications Following Resection of Pituitary Macroadenomas.** *Journal of neurological surgery. Part B, Skull base*
Thawani, J. P., Ramayya, A. G., Pisapia, J. M., Abdullah, K. G., Lee, J. Y., Grady, M. S.
2017; 78 (2): 184-190
- **Resident simulation training in endoscopic endonasal surgery utilizing haptic feedback technology** *JOURNAL OF CLINICAL NEUROSCIENCE*
Thawani, J. P., Ramayya, A. G., Abdullah, K. G., Hudgins, E., Vaughan, K., Piazza, M., Madsen, P. J., Buch, V., Grady, M.
2016; 34: 112-116
- **Intramedullary Recurrence of a Thoracic Meningioma-Presentation of an Unusual Case and Review of the Literature.** *World neurosurgery*
Piazza, M. A., Ramayya, A. G., Geiger, G. A., Alonso-Basanta, M., Nasrallah, M. P., Welch, W. C., Ozturk, A. K.
2016; 92: 588.e17-588.e21
- **Intraoperative Crisis Management in Spine Surgery: What To Do When Things Go Bad** *Benzel's Spine Surgery E-Book: Techniques, Complication Avoidance, and Management*
Ramayya, A., Abdullah, K., Tsai, E., Benzel, ., E.C. & Steinmetz, M.
Elsevier Health Sciences.2016
- **. Adjacent Segment Degeneration and Disease of the Cervical and Lumbar Spine. Spine Surgery: Techniques, Complication Avoidance, and Management** *Benzel's Spine Surgery E-Book: Techniques, Complication Avoidance, and Management*
Ramayya, A., Abdullah, K., Mroz, T.
Elsevier Health Sciences.2016
- **Expectation modulates neural representations of valence throughout the human brain.** *NeuroImage*
Ramayya, A. G., Pedisich, I., Kahana, M. J.
2015; 115: 214-23
- **Factors associated with increased survival after surgical resection of glioblastoma in octogenarians.** *PLoS one*
Abdullah, K. G., Ramayya, A., Thawani, J. P., Macyszyn, L., Martinez-Lage, M., O'Rourke, D. M., Brem, S.
2015; 10 (5): e0127202
- **Human intracranial high-frequency activity during memory processing: neural oscillations or stochastic volatility?** *Current opinion in neurobiology*
Burke, J. F., Ramayya, A. G., Kahana, M. J.
2015; 31: 104-10
- **Neurosurgery** *Schwartz's Principles of Surgery, 11th Edition*

Ramayya, A., Sinha, S., Grady, M.
McGraw-Hill Medical.2015

- **Electrophysiological evidence for functionally distinct neuronal populations in the human substantia nigra.** *Frontiers in human neuroscience*
Ramayya, A. G., Zaghloul, K. A., Weidemann, C. T., Baltuch, G. H., Kahana, M. J.
2014; 8: 655
- **Theta and high-frequency activity mark spontaneous recall of episodic memories.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
Burke, J. F., Sharan, A. D., Sperling, M. R., Ramayya, A. G., Evans, J. J., Healey, M. K., Beck, E. N., Davis, K. A., Lucas, T. H., Kahana, M. J.
2014; 34 (34): 11355-65
- **Microstimulation of the human substantia nigra alters reinforcement learning.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
Ramayya, A. G., Misra, A., Baltuch, G. H., Kahana, M. J.
2014; 34 (20): 6887-95
- **A DTI investigation of neural substrates supporting tool use.** *Cerebral cortex (New York, N.Y. : 1991)*
Ramayya, A. G., Glasser, M. F., Rilling, J. K.
2010; 20 (3): 507-16