Stanford

Anand Veeravagu, MD, FAANS, FACS

Associate Professor of Neurosurgery and, by courtesy, of Orthopaedic Surgery

CLINICAL OFFICE (PRIMARY)

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ACADEMIC CONTACT INFORMATION

- **Administrative Contact**

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Bio

BIO

Dr. Anand Veeravagu is Associate Professor of Neurosurgery and Associate Professor of Orthopedic Surgery, by courtesy, and Director of Minimally Invasive NeuroSpine Surgery here at Stanford. Dr. Veeravagu is board certified and is focused on advancing minimally invasive surgical techniques for diseases of the spine and cares for patients with a wide range of spinal disorders. Dr. Veeravagu is the Team Neurosurgeon for the San Francisco 49ers Football Team.

Dr. Veeravagu graduated from the Johns Hopkins University Biomedical Engineering program with a focus on spinal cord injury and regeneration. Committed to medical device development, neuroregeneration, and non-invasive imaging he accepted a position to complete his MD at the Stanford University School of Medicine. While a medical student, Dr. Veeravagu worked with neurosurgery and the molecular imaging program to develop novel, non-invasive imaging tools and treatments for malignant neoplasms of central nervous system.

Dr. Veeravagu subsequently completed his neurosurgical residency at Stanford University. As a resident, Dr. Veeravagu was appointed by the President of the United States as a White House Fellow in 2012, serving as Special Assistant to Secretary of Defense Leon Panetta and Chuck Hagel to guide Department of Defense Policy on traumatic brain injury, spinal cord injury, and mental health treatment for the United States military. One of 14 people from around the nation to be selected, Dr. Veeravagu served as a speech writer, national security advisor, and health consultant directly to the Secretary of Defense.

After completion of his neurosurgical residency, Dr. Veeravagu was awarded the prestigious Neurosurgical Research and Education Foundation Post-Residency Clinical Fellowship Grant and completed his fellowship training in minimally invasive and complex deformity spine at Stanford University with both neurosurgical and orthopaedic training. Dr. Veeravagu also completed a clinical scholar rotation at the University of Miami Miller School of Medicine focused on endoscopic and robotic spine surgery.

Dr. Veeravagu's research efforts are focused on the utilization of large national databases to assess cost, quality, and effectiveness of various treatment algorithms as well as predictive analytics.

CLINICAL FOCUS

- Neurosurgery
- Spine Surgery
- Minimally Invasive Spine Surgery
- Complex Deformity and Scoliosis Spine Surgery
- Robotic Spine Surgery
- Spinal Oncology
- spondylolisthesis
- artificial disc replacement
- Degenerative Disc Disease
- Adult reconstructive spinal surgery
- Spinal cord neoplasms
- Spinal metastatic disease
- spinal stenosis
- Spine Radiation Therapy & Radiosurgery

ACADEMIC APPOINTMENTS

- Associate Prof-Univ Med Line, Neurosurgery
- Associate Prof-Univ Med Line (By courtesy), Orthopaedic Surgery
- Member, Bio-X

ADMINISTRATIVE APPOINTMENTS

- Director of Minimally Invasive NeuroSpine Surgery, Stanford University School of Medicine, (2016- present)

PROFESSIONAL EDUCATION

- Residency: Stanford University Dept of Neurosurgery (2015) CA
- Fellowship: Stanford University Spine Fellowship (2016) CA
- Medical Education: Stanford University School of Medicine (2009) CA
- Board Certification: Neurosurgery, American Board of Neurological Surgery (2020)
- Board Certification, American Board of Neurological Surgery , FAANS, Neurosurgery (2020)
- Fellowship, University of Miami School of Medicine , Clinical Scholar in Spinal Robotics and Minimally Invasive Spine Surgery (2016)
- Fellowship, Stanford University , Minimally Invasive and Complex Deformity Spine Neurosurgery (2016)
- Bachelor of Science, Johns Hopkins University , Biomedical Engineering, conc. Electrical Engineering & Minor: Multicultural and Regional Studies (2005)

LINKS

- Get a Second Opinion: https://stanfordhealthcare.org/second-opinion/overview.html

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The focus of my laboratory is to utilize precision medicine techniques to improve the diagnosis and treatment of neurologic conditions. From traumatic brain injury to spinal scoliosis, the ability to capture detailed data regarding clinical symptoms and treatment outcomes has empowered us to do better for patients. Utilize data to do better for patients, that's what we do.

Stanford Neurosurgical Ai and Machine Learning Lab

http://med.stanford.edu/neurosurgery/research/AILab.html

CLINICAL TRIALS

- PET/MRI in the Diagnosis of Chronic Pain, Recruiting
- Dexamethasone With or Without Thalidomide in Treating Patients With Newly Diagnosed Multiple Myeloma, Not Recruiting

Teaching

STANFORD ADVISEES

Med Scholar Project Advisor

Bhav Jain, Aaradhya Pant, Umar Siddiqi, Kunal Varshneya, Ezra Yoseph

Postdoctoral Faculty Sponsor

. Ummey Hani

Publications

PUBLICATIONS

- **Value of Inpatient Neuromodulation: A National Analysis of Paddle Spinal Cord Stimulation Outcomes.** *Neurosurgery*
  Jain, B., Abikenari, M. A., Sadeghzadeh, S., Shah, A., Yoo, K. H., Azad, T. D., Hani, U., Ratliff, J. K., Ramayya, A. G., Veeravagu, A.
  2026
- **Risk-stratified management of ankylosing spondylitis-related spinal fractures-a meta-synthesis of contemporary surgical and nonsurgical strategies: a narrative review.** *Journal of spine surgery (Hong Kong)*
  Abikenari, M. A., Yoo, K. H., Liu, J., Ha, J., Nageeb, G., Jain, B., Park, L., Hani, U., Veeravagu, A.
  2025; 11 (4): 1095-1110
- **Current state and future perspectives of spinal navigation and robotics-an AO spine survey.** *Brain & spine*
  Motov, S., Butenschoen, V. M., Krauss, P. E., Veeravagu, A., Yoo, K. H., Stengel, F. C., Hejrati, N., Stienen, M. N.
  2025; 5: 104165
- **Aphasia and Chronic Subdural Hematoma Evacuation: A Retrospective Cohort Study** *NEUROSURGERY PRACTICE*
  Patil, S., Francis, J. J., Michel, M., Maeda, T., Veeravagu, A., Bonda, D., Nisson, P. L.
  2025; 6 (3): e000148
- **Publicly Available Datasets for Artificial Intelligence in Neurosurgery: A Systematic Review.** *Journal of clinical medicine*
  Chan, B., Kim, B., Schonfeld, E., Nageeb, G., Pant, A., Sjoholm, A., Medikonda, R., Hani, U., Veeravagu, A.
  2025; 14 (16)
- **Generation of synthetic tomographic images from biplanar X-ray: a narrative review of history, methods, and the state of the art.** *Journal of neurosurgical sciences*
  Alakmeh, A., Zanier, O., Bottini, M., Gandia-Gonzalez, M. L., Burström, G., Edström, E., Elmi Terander, A., Schonfeld, E., Veeravagu, A., Regli, L., Serra, C., Staartjes, V. E.
  2025; 69 (4): 350-361

- **Transforaminal Lumbar Interbody Fusion (TLIF) with Expandable Banana-Shaped Interbody Spacers-Institutional 5-Year Experience.** *Journal of clinical medicine*
  Stienen, M. N., Bertulli, L., Fischer, G., Battig, L., Yildiz, Y., Feuerstein, L., Kissling, F., Schofl, T., Stengel, F. C., Gianoli, D., Motov, S., Schonfeld, E., Veeravagu, et al
  2025; 14 (15)

- **Multilevel spinal fractures in ankylosing spondylitis: illustrative case.** *Journal of neurosurgery. Case lessons*
  Abikenari, M. A., Park, L. S., Yoo, K. H., Hani, U., Jain, B., Veeravagu, A.
  2025; 9 (26)

- **Microsurgical resection of an intramedullary metastasis of rare histopathology-a case report and comprehensive literature review.** *Journal of spine surgery (Hong Kong)*
  Stengel, F. C., Heisinger, S., Char, N. V., Veeravagu, A., Stienen, M. N.
  2025; 11 (2): 371-377

- **Minimally Invasive Lateral Thoracic and Lumbar Interbody Fusion with Expandable Interbody Spacers for Spine Trauma-Indications, Complications and Outcomes.** *Journal of clinical medicine*
  Bättig, L., Fischer, G., Martens, B., Veeravagu, A., Bertulli, L., Stienen, M. N.
  2025; 14 (13)

- **Preoperative Opioid Misuse Associations With Delayed Opioid Cessation, Pain, and Negative Affect After Spine Surgery.** *Neurospine*
  Hah, J. M., Levine, S. C., Khairnar, S., Pirrotta, L., Ben-Natan, A. R., Tse, E., Hettie, G., Alamin, T., Veeravagu, A., Hu, S., Hernandez-Boussard, T.
  2025; 22 (2): 451-464

- **Integrated management of metastatic spinal tumors: current status and future directions.** *Medical oncology (Northwood, London, England)*
  Kim, M. J., Marianayagam, N. J., Chandra, A., Ranalli, C., Schonfeld, E., Avila-Madrigal, J. P., Flusche, A. M., Schoeffler, K., Alomari, S., Rao, N. B., Yoo, K., Lam, F. C., Park, et al
  2025; 42 (6): 210

- **Single Position Lateral Anterior Lumbar Interbody Fusion at L5/S1.** *Neurosurgery*
  Stienen, M. N., Yoo, K., Schonfeld, E., Shah, V., Abikenari, M., Pangal, D., Chandra, V., Veeravagu, A.
  2025; 96 (3S): S17-S25

- **Single- versus multi-fraction spine stereotactic radiosurgery (ALL-STAR) for patients with spinal metastases: a randomized phase III trial protocol.** *BMC cancer*
  Pratapneni, A., Klebaner, D., Soltys, S. G., Rahimy, E., Gibbs, I. C., Chang, S. D., Li, G., Hayden Gephart, M., Veeravagu, A., Szalkowski, G. A., Gu, X., Wang, L., Chuang, et al
  2025; 25 (1): 323

- **Clinical outcomes and patient-reported outcome measures among patients undergoing posterior lumbar fusion procedures with varying insurance payor status: a propensity score-matching study.** *Journal of neurosurgery. Spine*
  Shah, A., Schonfeld, E., Haider, G., Marianayagam, N. J., Sadeghzadeh, S., Stienen, M. N., Veeravagu, A.
  2025: 1-9

- **Treatment of occult radiculopathy in complex regional pain syndrome by anterior cervical discectomy and fusion following localization by [18F]fluorodeoxyglucose radioligand and PET/MRI: illustrative case.** *Journal of neurosurgery. Case lessons*
  Schonfeld, E., Haider, G., Tawfik, V., Jin, M. C., Yoo, K., Marianayagam, N. J., Biswal, S., Veeravagu, A.
  2024; 8 (26)

- **Suspected and surgically managed cauda equina syndrome nationwide: epidemiological trends and socioeconomic factors influencing access to care.** *Journal of neurosurgical sciences*
  Johnstone, T. M., Shah, V., Haider, G., Yoo, K. H., Stienen, M. N., Veeravagu, A.
  2024

- **Trends in Sacroiliac Joint Fusion Costs and Utilization in the Privately Insured Population.** *Global spine journal*
  Johnstone, T., Schonfeld, E., Sadeghzadeh, S., Marianayagam, N. J., Yoo, K. H., Ratliff, J. K., Veeravagu, A.
  2024: 21925682241309302

- **Indications, complications and outcomes of minimally-invasive lateral lumbar interbody fusion with anterior column realignment vs. standard LLIF using expandable interbody spacers.** *Frontiers in surgery*
  Fischer, G., Bättig, L., Schöfl, T., Schonfeld, E., Veeravagu, A., Martens, B., Stienen, M. N.

2024; 11: 1455445

- **Transforaminal lumbar interbody fusion with or without release of the anterior longitudinal ligament: A single-center, retrospective observational cohort study.** *North American Spine Society journal*
  Högl-Roy, S., Hejrati, N., Stengel, F. C., Motov, S., Veeravagu, A., Martens, B., Stienen, M. N.
  2024; 19: 100533

- **Stereotactic Radiosurgery for Residual, Recurrent, and Metastatic Hemangiopericytomas: A Single-Institution Retrospective Experience.** *Neurosurgery*
  Yoo, K. H., Park, D. J., Veeravagu, A., Persad, A., Lee, M., Marianayagam, N. J., Zamarud, A., Gu, X., Pollom, E. L., Soltys, S. G., Meola, A., Chang, S. D.
  2024

- **American Association of Neurological Surgeons/Congress of the Neurological Surgeons Section on Tumors Guidelines: Assessing Their Impact on Brain Tumor Clinical Practice.** *Neurosurgery*
  Robertson, F. C., Nahed, B. V., Barkhoudarian, G., Veeravagu, A., Berg, D., Kalkanis, S., Olson, J. J., Germano, I. M.
  2024

- **Minimally-invasive lateral thoracic and lumbar interbody fusion (LLIF) with expandable interbody cages - Considerations, complications & outcomes.** *Brain & spine*
  Stienen, M. N., Fischer, G., Bättig, L., Veeravagu, A., Martens, B.
  2024; 4: 102870

- **Impact of Supine versus Prone Positioning on Segmental Lumbar Lordosis in Patients Undergoing ALIF Followed by PSF: A Comparative Study.** *Journal of clinical medicine*
  Sadeghzadeh, S., Yoo, K. H., Lopez, I., Johnstone, T., Schonfeld, E., Haider, G., Marianayagam, N. J., Stienen, M. N., Veeravagu, A.
  2024; 13 (12)

- **Focal motor weakness and recovery following chronic subdural hematoma evacuation.** *Journal of neurosurgery*
  Nisson, P. L., Francis, J., Michel, M., Patil, S., Uchikawa, H., Veeravagu, A., Bonda, D.
  2024: 1-8

- **Intradural cystic schwannomas of the spine: A case-based systematic review of an unusual tumor.** *Brain & spine*
  Terrapon, A. P., Stienen, M. N., Veeravagu, A., Fehlings, M., Bozinov, O., Hejrati, N.
  2024; 4: 102843

- **CyberKnife stereotactic radiosurgery for extramedullary plasmacytoma in the external auditory canal: illustrative case.** *Journal of neurosurgery. Case lessons*
  Patil, S., Shaghaghian, E., Yuan, L., Shah, A., Marianayagam, N. J., Park, D. J., Soltys, S. G., Veeravagu, A., Gibbs, I. C., Li, G., Chang, S. D.
  2024; 7 (19)

- **Experience with the utilization of new-generation shared-control robotic system for spinal instrumentation.** *Journal of neurosurgical sciences*
  Haider, G., Shah, V., Lopez, I., Wagner, K. E., Stienen, M. N., Veeravagu, A.
  2024

- **Deep Learning Prediction of Cervical Spine Surgery Revision Outcomes Using Standard Laboratory and Operative Variables.** *World neurosurgery*
  Schonfeld, E., Shah, A., Johnstone, T. M., Rodrigues, A., Morris, G. K., Stienen, M. N., Veeravagu, A.
  2024

- **Misplaced intraspinal venous stent causing cauda equina syndrome: illustrative case.** *Journal of neurosurgery. Case lessons*
  Shah, V., Johnstone, T., Haider, G., Marianayagam, N. J., Stienen, M. N., Chandra, V., Veeravagu, A.
  2024; 7 (7)

- **Evaluating Computer Vision, Large Language, and Genome-Wide Association Models in a Limited Sized Patient Cohort for Pre-Operative Risk Stratification in Adult Spinal Deformity Surgery.** *Journal of clinical medicine*
  Schonfeld, E., Pant, A., Shah, A., Sadeghzadeh, S., Pangal, D., Rodrigues, A., Yoo, K., Marianayagam, N., Haider, G., Veeravagu, A.
  2024; 13 (3)

- **Getting What You Pay For: Impact of Copayments on Physical Therapy and Opioid Initiation, Timing, and Continuation for Newly Diagnosed Low Back Pain.** *The spine journal : official journal of the North American Spine Society*

Jin, M. C., Jensen, M., Barros Guinle, M. I., Ren, A., Zhou, Z., Zygourakis, C. C., Desai, A. M., Veeravagu, A., Ratliff, J. K.
2024

- **Machine Learning in Neurosurgery: Toward Complex Inputs, Actionable Predictions, and Generalizable Translations** *CUREUS JOURNAL OF MEDICAL SCIENCE*
  Schonfeld, E., Mordekai, N., Berg, A., Johnstone, T., Shah, A., Shah, V., Haider, G., Marianayagam, N. J., Veeravagu, A.
  2024; 16 (1)
- **An Integrated 3-Dimentional Navigation System Increases the Accuracy, Efficiency, and Safety of Percutaneous Thoracolumbar Pedicle Screw Placement in Minimally Invasive Approaches: A Randomized Cadaveric Study.** *Global spine journal*
  Lakomkin, N., Eastlack, R. K., Uribe, J. S., Park, P., Ryu, S. I., Kretzer, R., Mimran, R. I., Holman, P., Veeravagu, A., Hassanzadeh, H., Johnson, M. M., Sullivan, L., Clark, et al
  2024: 21925682231224394
- **Machine Learning in Neurosurgery: Toward Complex Inputs, Actionable Predictions, and Generalizable Translations.** *Cureus*
  Schonfeld, E., Mordekai, N., Berg, A., Johnstone, T., Shah, A., Shah, V., Haider, G., Marianayagam, N. J., Veeravagu, A.
  2024; 16 (1): e51963
- **Intradural cystic schwannomas of the spine: A case-based systematic review of an unusual tumor** *BRAIN AND SPINE*
  Terrapon, A., Stienen, M. N., Veeravagu, A., Fehlings, M., Bozinov, O., Hejrati, N.
  2024; 4
- **Minimally-invasive lateral thoracic and lumbar interbody fusion (LLIF) with expandable interbody cages - Considerations, complications & outcomes** *BRAIN AND SPINE*
  Stienen, M. N., Fischer, G., Battig, L., Veeravagu, A., Martens, B.
  2024; 4
- **Stanford University School of Medicine: Our Neurosurgical Heritage.** *Neurosurgery*
  Veeravagu, A., Kim, L. H., Rao, V. L., Lim, M., Shuer, L. M., Harris, O. A., Steinberg, G. K.
  2023
- **Type II Odontoid Fractures in the Elderly Presenting to the Emergency Department: An Assessment of Factors Affecting In-Hospital Mortality and Discharge to Skilled Nursing Facilities.** *The spine journal : official journal of the North American Spine Society*
  Johnstone, T., Shah, V., Schonfeld, E., Sadeghzadeh, S., Haider, G., Stienen, M., Marianayagam, N. J., Veeravagu, A.
  2023
- **Accuracy of predicted postoperative segmental lumbar lordosis in spinal fusion using an intraoperative robotic planning and guidance system.** *Journal of neurosurgical sciences*
  Haider, G., Shah, V., Johnstone, T., Maldaner, N., Stienen, M., Veeravagu, A.
  2023
- **Spinal metastases of pineal region glioblastoma with primitive neuroectodermal features highlighting the importance of molecular diagnoses: illustrative case.** *Journal of neurosurgery. Case lessons*
  Shah, A., Marianayagam, N. J., Zamarud, A., Park, D. J., Persad, A. R., Soltys, S. G., Chang, S. D., Veeravagu, A.
  2023; 6 (20)
- **STEREOTACTIC RADIOSURGERY FOR RESIDUAL, RECURRENT, AND METASTATIC HEMANGIOPERICYTOMAS: A SINGLE INSTITUTION EXPERIENCE**
  Yoo, K., Park, D., Veeravagu, A., Lee, M., Marianayagam, N., Zamarud, A., Gu, X., Pollom, E., Soltys, S., Chang, S., Meola, A.
  OXFORD UNIV PRESS INC.2023
- **Socio-economic disparities influence likelihood of post-operative radiation to resection cavities of metastatic brain tumors** *ACTA NEUROCHIRURGICA*
  Haider, G., Dadey, D. Y. A., Rodrigues, A., Pollom, E. L., Adler, J. R., Veeravagu, A.
  2023
- **Socio-economic disparities influence likelihood of post-operative radiation to resection cavities of metastatic brain tumors.** *Acta neurochirurgica*
  Haider, G., Dadey, D. Y., Rodrigues, A., Pollom, E. L., Adler, J. R., Veeravagu, A.
  2023

- **Sigma-1 receptor expression in a subpopulation of lumbar spinal cord microglia in response to peripheral nerve injury.** *Scientific reports*
  Schonfeld, E., Johnstone, T. M., Haider, G., Shah, A., Marianayagam, N. J., Biswal, S., Veeravagu, A.
  2023; 13 (1): 14762

- **Demonstrating the successful application of synthetic learning in spine surgery for training multi-center models with increased patient privacy.** *Scientific reports*
  Schonfeld, E., Veeravagu, A.
  2023; 13 (1): 12481

- **Progression to fusion after lumbar laminectomy for degenerative lumbar spondylolisthesis: Rate and risk-factors. A national database study.** *Clinical neurology and neurosurgery*
  Haider, G., Varshneya, K., Rodrigues, A., Marianayagam, N., Stienen, M. N., Veeravagu, A.
  2023; 233: 107919

- **Artificial Intelligence in Neurosurgery: A State-of-the-Art Review from Past to Future.** *Diagnostics (Basel, Switzerland)*
  Tangsrivimol, J. A., Schonfeld, E., Zhang, M., Veeravagu, A., Smith, T. R., Härtl, R., Lawton, M. T., El-Sherbini, A. H., Prevedello, D. M., Glicksberg, B. S., Krittanawong, C.
  2023; 13 (14)

- **Contemporary Trends in Minimally Invasive Sacroiliac Joint Fusion Utilization in the Medicare Population by Specialty.** *Neurosurgery*
  Hersh, A. M., Jimenez, A. E., Pellot, K. I., Gong, J. H., Jiang, K., Khalifeh, J. M., Ahmed, A. K., Raad, M., Veeravagu, A., Ratliff, J. K., Jain, A., Lubelski, D., Bydon, et al
  2023

- **Clinical Outcomes and Cost Profiles for Cage and Allograft Anterior Cervical Discectomy and Fusion Procedures in the Adult Population: A Propensity Score-Matched Study** *ASIAN SPINE JOURNAL*
  Rodrigues, A., Varshneya, K., Stienen, M., Schonfeld, E., Than, K., Veeravagu, A.
  2023

- **The Impact of Preoperative Myelopathy on Postoperative Outcomes among Anterior Cervical Discectomy and Fusion Procedures in the Nonelderly Adult Population: A Propensity-Score Matched Study.** *Asian spine journal*
  Rodrigues, A. J., Schonfeld, E., Varshneya, K., Stienen, M. N., Veeravagu, A.
  2023

- **Clinical Outcomes and Cost Profiles for Cage and Allograft Anterior Cervical Discectomy and Fusion Procedures in the Adult Population: A Propensity Score-Matched Study.** *Asian spine journal*
  Rodrigues, A. J., Varshneya, K., Stienen, M. N., Schonfeld, E., Than, K. D., Veeravagu, A.
  2023

- **Assessing Racial, Ethnic, and Sex Disparities in Neurosurgical Clinical Trials 2008-Present**
  Shah, V., Turner, B., Ahmed, M., Veeravagu, A., Hernandez-Boussard, T.
  AMER ASSOC NEUROLOGICAL SURGEONS.2023

- **Clinical outcomes and cost differences between patients undergoing primary anterior cervical discectomy and fusion procedures with private or Medicare insurance: a propensity score matched study.** *World neurosurgery*
  Shah, V., Rodrigues, A. J., Malhotra, S., Johnstone, T., Varshneya, K., Haider, G., Stienen, M. N., Veeravagu, A.
  2023

- **Commentary: Technique for Validation of Intraoperative Navigation in Minimally Invasive Spine Surgery.** *Operative neurosurgery (Hagerstown, Md.)*
  Haider, G., Veeravagu, A.
  2023

- **Neurosurgical Utilization, Charges, and Reimbursement After the Affordable Care Act: Trends From 2011 to 2019.** *Neurosurgery*
  Hersh, A. M., Dedrickson, T., Gong, J. H., Jimenez, A. E., Materi, J., Veeravagu, A., Ratliff, J. K., Azad, T. D.
  2023

- **Telehealth in Neurosurgery: 2021 Council of State Neurosurgical Societies National Survey Results.** *World neurosurgery*
  Xu, J. C., Haider, S. A., Sharma, A., Blumenfeld, K., Cheng, J., Mazzola, C. A., Orrico, K. O., Rosenow, J., Stacy, J., Stroink, A., Tomei, K., Tumialan, L., Veeravagu, et al
  2022

- **Comparison of Deep Learning and Classical Machine Learning Algorithms to Predict Post-operative Outcomes for Anterior Cervical Discectomy and Fusion Procedures with State-of-the-art Performance.** *Spine*
  Rodrigues, A. J., Schonfeld, E., Varshneya, K., Stienen, M. N., Staartjes, V. E., Jin, M. C., Veeravagu, A.
  2022
- **Utilization Trends, Cost, and Payments for Adult Spinal Deformity Surgery in Commercial and Medicare-Insured Populations.** *Neurosurgery*
  Wadhwa, H., Leung, C., Sklar, M., Ames, C. P., Veeravagu, A., Desai, A., Ratliff, J., Zygourakis, C. C.
  2022
- **Chronic opioid use prior to ACDF surgery is associated with inferior post-operative outcomes: a propensity-matched study of 17,443 chronic opioid users.** *World neurosurgery*
  Rodrigues, A. J., Varshneya, K., Schonfeld, E., Malhotra, S., Stienen, M. N., Veeravagu, A.
  2022
- **Health Care Resource Utilization in Management of Opioid-Naive Patients With Newly Diagnosed Neck Pain.** *JAMA network open*
  Jin, M. C., Jensen, M., Zhou, Z., Rodrigues, A., Ren, A., Barros Guinle, M. I., Veeravagu, A., Zygourakis, C. C., Desai, A. M., Ratliff, J. K.
  2022; 5 (7): e2222062
- **Utilization of lateral anterior lumbar interbody fusion for revision of failed prior TLIF: illustrative case.** *Journal of neurosurgery. Case lessons*
  Haider, G., Wagner, K. E., Chandra, V., Cheng, I., Stienen, M. N., Veeravagu, A.
  2022; 3 (23): CASE2296
- **Impact of socio-economic factors on radiation treatment after resection of metastatic brain tumors: trends from a private insurance database.** *Journal of neuro-oncology*
  Dadey, D. Y., Rodrigues, A., Haider, G., Pollom, E. L., Adler, J. R., Veeravagu, A.
  2022
- **The Comparison of Deep Learning and Classical Machine Learning Algorithms to Predict Post-operative Outcomes for Anterior Cervical Discectomy and Fusion Procedures with State-ofthe-art Performance**
  Rodrigues, A. J., Rodrigues, A., Varshneya, K., Stienen, M., Veeravagu, A.
  AMER ASSOC NEUROLOGICAL SURGEONS.2022
- **Factors Which Predict Adverse Outcomes in Anterior Cervical Discectomy and Fusion Procedures in the Nonelderly Adult Population.** *Clinical spine surgery*
  Rodrigues, A. J., Jokhai, R., Varshneya, K., Stienen, M. N., Veeravagu, A.
  2022
- **Commentary: Robotic Nerve Sheath Tumor Resection With Intraoperative Neuromonitoring: Case Series and Systematic Review.** *Operative neurosurgery (Hagerstown, Md.)*
  Wagner, K. E., Haider, G., Veeravagu, A.
  2022
- **Vertebrae segmentation in reduced radiation CT imaging for augmented reality applications.** *International journal of computer assisted radiology and surgery*
  Schonfeld, E., de Lotbiniere-Bassett, M., Jansen, T., Anthony, D., Veeravagu, A.
  1800
- **A Discussion of Machine Learning Approaches for Clinical Prediction Modeling.** *Acta neurochirurgica. Supplement*
  Jin, M. C., Rodrigues, A. J., Jensen, M., Veeravagu, A.
  2022; 134: 65-73
- **Commentary: Loss of Relativity: The Physician Fee Schedule, the Neurosurgeon, and the Trojan Horse** *NEUROSURGERY*
  Tumialan, L. M., Veeravagu, A., Ratliff, J. K.
  2021; 89 (6): E323-E324
- **Do Epidural Steroid Injections Affect Outcomes and Costs in Cervical Degenerative Disease? A Retrospective MarketScan Database Analysis.** *Global spine journal*
  Wadhwa, H., Varshneya, K., Stienen, M. N., Veeravagu, A.
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