



Anand Veeravagu

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

CLINICAL OFFICE (PRIMARY)

- **Stanford Neuroscience Health Center**

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ACADEMIC CONTACT INFORMATION

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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. Dr. Veeravagu is also an author and writes about current events, health policy, and public health-related topics for the San Francisco Chronicle, The Daily Beast, The BBC, and the Huffington Post.

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 Professor - University Medical Line, Neurosurgery
- Associate Professor - University Medical 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

- Medical Record Review: <https://stanfordhealthcare.org/second-opinion/medical-record-review.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

Postdoctoral Faculty Sponsor

Kelly Yoo

Publications

PUBLICATIONS

- **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-Dimensional 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
- **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. 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
- **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., Zygorakis, 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., Zygorakis, 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
- **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.
2021: 21925682211050320
- **The impact of osteoporosis on adult deformity surgery outcomes in Medicare patients.** *European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society*
Varshneya, K., Bhattacharjya, A., Jokhai, R. T., Fatemi, P., Medress, Z. A., Stienen, M. N., Ho, A. L., Ratliff, J. K., Veeravagu, A.
2021
- **Commentary: Loss of Relativity: The Physician Fee Schedule, the Neurosurgeon, and the Trojan Horse.** *Neurosurgery*
Tumialan, L. M., Veeravagu, A., Ratliff, J. K.
2021
- **Outcome Measures of Medicare Patients With Diabetes Mellitus Undergoing Thoracolumbar Deformity Surgery.** *Clinical spine surgery*
Varshneya, K., Bhattacharjya, A., Sharma, J., Stienen, M. N., Medress, Z. A., Ratliff, J. K., Veeravagu, A.
2021
- **Surgical Outcomes of Human Immunodeficiency Virus-positive Patients Undergoing Lumbar Degenerative Surgery.** *Clinical spine surgery*
Varshneya, K., Wadhwa, H., Ho, A. L., Medress, Z. A., Stienen, M. N., Desai, A., Ratliff, J. K., Veeravagu, A.
2021
- **External validation of a predictive model of adverse events following spine surgery.** *The spine journal : official journal of the North American Spine Society*
Fatemi, P., Zhang, Y., Han, S. S., Purington, N., Zygorakis, C. C., Veeravagu, A., Desai, A., Park, J., Shuer, L. M., Ratliff, J. K.
2021
- **Factors which predict adverse events following surgery in adults with cervical spinal deformity** *BONE & JOINT JOURNAL*
Varshneya, K., Jokhai, R., Medress, Z. A., Stienen, M. N., Ho, A., Fatemi, P., Ratliff, J. K., Veeravagu, A.
2021; 103B (4): 734–38
- **Factors which predict adverse events following surgery in adults with cervical spinal deformity.** *The bone & joint journal*
Varshneya, K., Jokhai, R., Medress, Z. A., Stienen, M. N., Ho, A., Fatemi, P., Ratliff, J. K., Veeravagu, A.

2021; 103-B (4): 734–38

- **Risk Factors for Revision Surgery After Primary Adult Thoracolumbar Deformity Surgery.** *Clinical spine surgery*
Varshneya, K., Stienen, M. N., Medress, Z. A., Fatemi, P., Pendharkar, A. V., Ratliff, J. K., Veeravagu, A.
2021
- **Advanced Age Does Not Impact Outcomes After 1-level or 2-level Lateral Lumbar Interbody Fusion.** *Clinical spine surgery*
Wadhwa, H., Oquendo, Y. A., Tigchelaar, S. S., Warren, S. I., Koltsov, J. C., Desai, A., Veeravagu, A., Alamin, T. F., Ratliff, J. K., Hu, S. S., Cheng, I.
2021
- **Defining and Describing Treatment Heterogeneity in New-Onset Idiopathic Lower Back and Extremity Pain Through Reconstruction of Longitudinal Care Sequences.** *The spine journal : official journal of the North American Spine Society*
Jin, M. C., Azad, T. D., Fatemi, P., Ho, A. L., Vail, D., Zhang, Y., Feng, A. Y., Kim, L. H., Bentley, J. P., Stienen, M. N., Li, G., Desai, A. M., Veeravagu, et al
2021
- **Anterior Cervical Discectomy and Fusion vs. Laminoplasty for Multilevel Cervical Spondylotic Myelopathy: A National Administrative Database Analysis.** *World neurosurgery*
Wadhwa, H., Sharma, J., Varshneya, K., Fatemi, P., Nathan, J., Medress, Z. A., Stienen, M. N., Ratliff, J. K., Veeravagu, A.
2021
- **Obesity in Patients Undergoing Lumbar Degenerative Surgery-A Retrospective Cohort Study of Postoperative Outcomes.** *Spine*
Varshneya, K., Wadhwa, H., Stienen, M. N., Ho, A. L., Medress, Z. A., Aikin, J., Li, G., Desai, A., Ratliff, J. K., Veeravagu, A.
2021; 46 (17): 1191-1196
- **Single vs Multistage Surgical Management of Single and Two-Level Lumbar Degenerative Disease.** *World neurosurgery*
Varshneya, K., Wadhwa, H., Stienen, M. N., Ho, A. L., Medress, Z. A., Herrick, D. B., Desai, A., Ratliff, J. K., Veeravagu, A.
2021
- **Global adoption of robotic technology into neurosurgical practice and research.** *Neurosurgical review*
Stumpo, V., Staartjes, V. E., Klukowska, A. M., Golahmadi, A. K., Gadjradj, P. S., Schroder, M. L., Veeravagu, A., Stienen, M. N., Serra, C., Regli, L.
2020
- **Commentary: The Enforceability of Noncompete Clauses in the Medical Profession: A Review by the Workforce Committee and the Medico-legal Committee of the Council of State Neurosurgical Societies.** *Neurosurgery*
Veeravagu, A., Medress, Z. A., Ratliff, J.
2020
- **Adult spinal deformity surgery: is there a need for a second attending? Response** *JOURNAL OF NEUROSURGERY-SPINE*
Medress, Z. A., Khormae, S., Stienen, M. N., Veeravagu, A., Cheng, I.
2020; 33 (5): 558–59
- **Medical malpractice in spine surgery: a review** *NEUROSURGICAL FOCUS*
Medress, Z. A., Jin, M. C., Feng, A., Varshneya, K., Veeravagu, A.
2020; 49 (5): E16
- **Fostering Reproducibility and Generalizability in Machine Learning for Clinical Prediction Modeling in Spine Surgery.** *The spine journal : official journal of the North American Spine Society*
Azad, T. D., Ehresman, J., Ahmed, A. K., Staartjes, V. E., Lubelski, D., Stienen, M. N., Veeravagu, A., Ratliff, J. K.
2020
- **Predictive Modeling of Long-Term Opioid and Benzodiazepine Use after Intradural Tumor Resection.** *The spine journal : official journal of the North American Spine Society*
Jin, M. C., Ho, A. L., Feng, A. Y., Zhang, Y., Staartjes, V. E., Stienen, M. N., Han, S. S., Veeravagu, A., Ratliff, J. K., Desai, A. M.
2020
- **Machine learning in neurosurgery: a global survey.** *Acta neurochirurgica*
Staartjes, V. E., Stumpo, V., Kernbach, J. M., Klukowska, A. M., Gadjradj, P. S., Schroder, M. L., Veeravagu, A., Stienen, M. N., van Niftrik, C. H., Serra, C., Regli, L.
2020
- **Predictors of 2-year reoperation in Medicare patients undergoing primary thoracolumbar deformity surgery.** *Journal of neurosurgery. Spine*

- Varshneya, K., Jokhai, R. T., Fatemi, P., Stienen, M. N., Medress, Z. A., Ho, A. L., Ratliff, J. K., Veeravagu, A.
2020: 1–5
- **A Comparative Analysis of Patients Undergoing Fusion for Adult Cervical Deformity by Approach Type.** *Global spine journal*
Varshneya, K., Medress, Z. A., Stienen, M. N., Nathan, J., Ho, A., Pendharkar, A. V., Loo, S., Aikin, J., Li, G., Desai, A., Ratliff, J. K., Veeravagu, A.
2020: 2192568220915717
 - **A Comparative Analysis of Patients Undergoing Fusion for Adult Cervical Deformity by Approach Type** *GLOBAL SPINE JOURNAL*
Varshneya, K., Medress, Z. A., Stienen, M. N., Nathan, J., Ho, A., Pendharkar, A. V., Loo, S., Aikin, J., Li, G., Desai, A., Ratliff, J. K., Veeravagu, A.
2020
 - **Objective activity tracking in spine surgery: a prospective feasibility study with a low-cost consumer grade wearable accelerometer.** *Scientific reports*
Stienen, M. N., Rezaii, P. G., Ho, A. L., Veeravagu, A., Zygourakis, C. C., Tomkins-Lane, C., Park, J., Ratliff, J. K., Desai, A. M.
2020; 10 (1): 4939
 - **Postoperative Complication Burden, Revision Risk, and Health Care Use in Obese Patients Undergoing Primary Adult Thoracolumbar Deformity Surgery** *GLOBAL SPINE JOURNAL*
Varshneya, K., Pangal, D. J., Stienen, M. N., Ho, A. L., Fatemi, P., Medress, Z. A., Herrick, D. B., Desai, A., Ratliff, J. K., Veeravagu, A.
2020
 - **Postoperative Complication Burden, Revision Risk, and Health Care Use in Obese Patients Undergoing Primary Adult Thoracolumbar Deformity Surgery.** *Global spine journal*
Varshneya, K., Pangal, D. J., Stienen, M. N., Ho, A. L., Fatemi, P., Medress, Z. A., Herrick, D. B., Desai, A., Ratliff, J. K., Veeravagu, A.
2020: 2192568220904341
 - **Lumboperitoneal and Ventriculoperitoneal Shunting for Idiopathic Intracranial Hypertension Demonstrate Comparable Failure and Complication Rates** *NEUROSURGERY*
Azad, T. D., Zhang, Y., Varshneya, K., Veeravagu, A., Ratliff, J. K., Li, G.
2020; 86 (2): 272–80
 - **Cervical osteochondroma: surgical planning.** *Spinal cord series and cases*
Fowler, J. n., Takayanagi, A. n., Siddiqi, I. n., Ghanchi, H. n., Siddiqi, J. n., Veeravagu, A. n., Desai, A. n., Vrionis, F. n., Hariri, O. R.
2020; 6 (1): 44
 - **A Predictive-Modeling Based Screening Tool for Prolonged Opioid Use after Surgical Management of Low Back and Lower Extremity Pain.** *The spine journal : official journal of the North American Spine Society*
Zhang, Y. n., Fatemi, P. n., Medress, Z. n., Azad, T. D., Veeravagu, A. n., Desai, A. n., Ratliff, J. K.
2020
 - **Costs and Complications Associated with Resection of Supratentorial Tumors with and without the Operative Microscope in the United States.** *World neurosurgery*
Zhang, Y. n., Zhang, M. n., Lin, M. n., Gephart, M. H., Veeravagu, A. n., Ratliff, J. K., Li, G. n.
2020
 - **Complications, Costs, and Quality Outcomes of Patients Undergoing Cervical Deformity Surgery with Intraoperative BMP Use.** *Spine*
Varshneya, K. n., Wadhwa, H. n., Pendharkar, A. V., Medress, Z. A., Stienen, M. N., Ratliff, J. K., Veeravagu, A. n.
2020
 - **Opioid Prescribing Patterns for Low Back Pain Among Commercially-Insured Children.** *Spine*
Azad, T. D., Harries, M. D., Veeravagu, A. n., Ratliff, J. K.
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