

# Heeren Makanji

31 Seymour St, Hartford, CT 06106  
(203) 644-3597 ▪ hmakanji@oahctmd.com

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## *EDUCATION/EMPLOYMENT*

Orthopaedic Associates of Hartford (Oct 2020-Present)

- Orthopaedic Spine and Trauma Surgeon
- Partner Physician
- Hartford Surgical Center Associate Medical Director
- Appointment at Hartford Hospital, Bone and Joint Institute

Orthopaedic and Neurosurgery Specialists, Greenwich, CT (Sep 2019-Sept 2020)

- Associate Partner, Orthopaedic Spine Surgeon
- Appointment at Greenwich Hospital, affiliate of Yale New Haven Health

Rothman Institute/Thomas Jefferson University Spine Fellowship (Aug 2018-Aug 2019)

- Clinical Instructor of Orthopaedic Surgery, Sidney Kimmel School of Medicine at Thomas Jefferson University

Harvard Combined Orthopaedic Residency Program (Jun 2013 – Jun 2018)

- Chief Resident 12/18/17-06/18/17
- American Board of Orthopaedic Surgery Part I Examination: Pass

Harvard Medical School (Aug 2009 – May 2013)

- M.D., Cum Laude
- Thesis: The Diagnosis of Carpal Tunnel Syndrome
- USMLE step 1: 256, step 2 (CK): 258, step 2 (CS): pass, step 3: 238

University of Connecticut (Aug 2005 – May 2009)

- M.S. Biochemistry
- B.S. Molecular and Cell Biology
- Summa Cum Laude, University Scholar, Honors Scholar
- Thesis: Contribution of the Novel C-terminal Domain to the Ribosome Binding Activities of Virulence Regulator BipA

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## *BASIC SCIENCE RESEARCH EXPERIENCE*

University of Connecticut, Department of Molecular and Cell Biology (Aug 2007 – May 2009)

- Mentors: Dr. Victoria Robinson (primary), Dr. Debra Kendall, Dr. David Knecht
- Master's and University Scholar Thesis Project: Biochemical Properties of Bacterial Virulence Regulator BipA

Burke Medical Research Institute Research Fellowship (May 2006 - Aug 2006)

- Mentor: Dr. John Pinto

- Project: Effect of Natural and Synthetic Selenium Compounds on Viability of Prostate Cancer Cells in Vitro

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### *PROFESSIONAL EXPERIENCE*

Global Spine Journal and Journal of Neurosurgery (Aug 2019-Present)

- Reviewer

Clinical Spine Surgery (Aug 2018-Present)

- Editorial Board

Lineage Medical LLC – Orthobullets (Jun 2014 – Present)

- Level 1 author responsible for writing new topics/questions and reviewing contributions of other authors prior to public release
- Piloted program for new education interfaces
- Investment partner in corporation

Harvard Medical School Admissions Committee (Sep 2010 – Mar 2011)

- Interviewed medical school applicants and presented to committee for consideration
- Attended bi-weekly meetings to review candidates

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### *PERSONAL EXPERIENCES*

Cambridge Coaching Tutoring Service (Oct 2012 – Jun 2013)

- Paid one-on-one tutor for high school and college level life sciences and MCAT preparation

Harvard Manville Mentoring Program (Oct 2009 – Feb 2011)

- Weekly one-on-one mentoring session with program student with psychiatric condition and developmental delay
- Monthly didactic session reviewing psychopharmacology and development of children with psychiatric disorders

Nutmeg Big Brothers Big Sisters (Sep 2007 – May 2009)

- Big brother for underprivileged youth at local elementary and middle school
- Weekly one-on-one session completing homework, activities, and playing sports

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### *PEER-REVIEWED PUBLICATIONS*

**Makanji HS**, Solomito MJ, Maffeo-Mitchell C, Esmende S, Finkel K. Utility of Erector Spinae Plane Blocks for Postoperative Pain Management and Opioid Reduction Following Lumbar Fusions. Clin Spine Surg. 2022 Sep 13. doi: 10.1097/BSD.0000000000001387. Epub ahead of print. PMID: 36097343.

Wellington IJ, Kia C, Coskun E, Torre BB, Antonacci CL, Mancini MR, Connors JP, Esmende SM, **Makanji HS**. Cervical and Lumbar Disc Arthroplasty: A Review of Current Implant Design and Outcomes. Bioengineering (Basel). 2022 May 23;9(5):227. doi: 10.3390/bioengineering9050227. PMID: 35621505; PMCID: PMC9137579.

Fisher CG, Vaccaro AR, Mahtabfar A, Mulpuri K, Evanview N, Dea N, **Makanji H**, Whang PG, Heller JE. Evidence-based Recommendations for Spine Surgery. *Spine (Phila Pa 1976)*. 2022 Jul 1;47(13):967-975. doi: 10.1097/BRS.0000000000004350. Epub 2022 Mar 3. PMID: 35238857.

Kia C, Antonacci CL, Wellington I, **Makanji HS**, Esmende SM. Spinal Implant Osseointegration and the Role of 3D Printing: An Analysis and Review of the Literature. *Bioengineering (Basel)*. 2022 Mar 6;9(3):108. doi: 10.3390/bioengineering9030108. PMID: 35324797; PMCID: PMC8944949.

Divi SN, **Makanji HS**, Kepler CK, Anderson DG, Goyal DKC, Warner ED, Galetta MS, Hilibrand AS, Kaye ID, Kurd MF, Radcliff KE, Rihn JA, Woods BI, Vaccaro AR, Schroeder GD. Does the Size or Location of Lumbar Disc Herniation Predict the Need for Operative Treatment? *Global Spine J*. 2022 Mar;12(2):237-243. doi: 10.1177/2192568220948519. Epub 2020 Sep 16. PMID: 32935569; PMCID: PMC8907636.

Vaccaro AR, Fisher CG, Prasad SK, Whang PG, Dea N, Thomas KC, Mulpuri K, **Makanji HS**. Evidence-based Recommendations for Spine Surgery. *Spine (Phila Pa 1976)*. 2021 Jul 15;46(14):975-982. doi: 10.1097/BRS.0000000000004091. PMID: 34160375.

Vaccaro AR, Fisher CG, Prasad SK, **Makanji HS**, Mulpuri K, Thomas KC, Dea N, Chi J, Whang PG. Evidence-based Recommendations for Spine Surgery. *Spine (Phila Pa 1976)*. 2021 Feb 15;46(4):E277-E285. doi: 10.1097/BRS.0000000000003838. PMID: 33290372.

Divi SN, **Makanji HS**, Kepler CK, Anderson DG, Goyal DKC, Warner ED, Galetta MS, Hilibrand AS, Kaye ID, Kurd MF, Radcliff KE, Rihn JA, Woods BI, Vaccaro AR, Schroeder GD. Does the Size or Location of Lumbar Disc Herniation Predict the Need for Operative Treatment? *Global Spine J*. 2020 Sep 16;2192568220948519. doi: 10.1177/2192568220948519. Epub ahead of print. PMID: 32935569.

Lin A, **Makanji HS**, Divi SN, Goyal DKC, Galetta MS, Schroeder GD, Kepler CK, Vaccaro AR. A Review of CSF and Serum Biomarkers to Stratify Acute Spinal Cord Injury (SCI). *Contemporary Spine Surgery*. 2020 21(1):1-7

**Makanji HS**, Bilolikar VK, Goyal DK, Kurd MF. Ambulatory Surgery Center Payment Models: Current Trends and Future Directions. *J Spine Surg*. 2019 Sep;5(Suppl 2):S191-S194

Delsole EM, **Makanji HS**, Kurd MF. Current Trends in Ambulatory Spine Surgery: A Systematic Review. *J Spine Surg*. 2019 Sep;5(Suppl 2):S124-S132

Galetta MS, **Makanji HS**, Strony J, Goyal DKC, Kurd MF. Changing Reimbursement Models and Private Equity Ownership in Spine Surgery. *Ann Transl Med*. 2019 Sep; 7(Suppl 5):S166

**Makanji HS**, Schroeder GD, Vaccaro AR, Hoffman EG. What is the Best Material for an Interbody Cage? *Clin Spine Surg*. 2020 May;33(4):137-139.

Tobert DG, **Makanji HS**, Cha TD. Lumbar Interbody Fusion for Adjacent Segment Disease: An Illustrative Case of the Lateral Transpsoas Approach (XLIF-DLIF). *Semin Spine Surg*. 2018;30(4):258-264

**Makanji H**, Schoenfeld AJ, Bhalla A, Bono CM. Critical Analysis of Trends in Lumbar Fusion for Degenerative Disorders Revisited: Influence of Technique on Fusion Rate and Clinical Outcomes. *Eur Spine J*. 2018;27(8):1868-1876

**Makanji HS**, Jenis LG. Understanding Financial Statements in Clinical Practice: A Primer. *Clin Spine Surg*. 2017;30(4):167-168

**Makanji HS**, Le H, Wood KB, Jenis LG, Cha TD. Morphometric Analysis of the Retroperitoneal Vessels with Respect to Lateral Access Surgery in Adult Scoliosis. *Clin Spine Surg*. 2017;30(7):E1010-E1014

Schoenfeld AJ, **Makanji H**, Jiang W, Koehlmoos T, Bono CM, Haider AH. Is There Variation in Procedural Utilization for Lumbar Spine Disorders Between a Fee-for-Service and Salaried Healthcare System. *Clin Orthop Relat Res*. 2017;475(12):2838-2844

**Makanji HS**, Nwosu K, Bono CM. Editorial on “Long-term clinical outcomes of cervical disc arthroplasty: a prospective, randomized, controlled trial” by Sasso et al. *J Spine Surg*. 2016;2(4):353-356

**Makanji HS**, Bhalla A, Bono CM. BMP-2 with Anterior Lumbar Interbody Fusion: Clinical Usage and Recent Controversies. *Semin Spine Surg*. 2016;28(4):233-238

Ghori A, Konopka FJ, **Makanji H**, Cha TD, Bono CM. Long Term Societal Costs of Anterior Discectomy and Fusion (ACDF) versus Cervical Disc Arthroplasty (CDA) for Treatment of Cervical Radiculopathy. *Int J Spine Surg*. 2016;10:1

Ghori A, Le HV, **Makanji H**, Cha T. Posterior Fixation Techniques in the Subaxial Cervical Spine. *Cureus*. 2015;7(10):e338

**Makanji H**, Ghori A, Brick GW. Atraumatic Lumbosacral Fusion Mass Fracture: Bisphosphonates to Blame? *Orthopaedic Journal at Harvard Medical School*. 2015;16:82-87

Okike K, Lee OC, **Makanji H**, Morgan JH, Harris MB, Vrahas MS. Comparison of Locked Plate Fixation and Nonoperative Management for Displaced Proximal Humerus Fractures in Elderly Patients. *Am J Orthop*. 2015;44(4):E106-112

Becker SJ, **Makanji HS**, Ring D. Changes in Treatment Plan for Carpal Tunnel Syndrome Based on Electrodiagnostic Test Results. *J Hand Surg Eur Vol*. 2014;39(2):187-193

**Makanji HS**, Becker SJ, Mudgal CS, Jupiter JB, Ring D. Evaluation of the Scratch Collapse Test for the Diagnosis of Carpal Tunnel Syndrome. *J Hand Surg Eur Vol*. 2014;39(2):181-186

**Makanji HS**, Zhao M, Mudgal CS, Jupiter JB, Ring D. Correspondence Between Clinical Presentation and Electrophysiological Testing for Potential Carpal Tunnel Syndrome. *J Hand Surg Eur Vol.* 2013;38(5):489-495

Okike K, Lee OC, **Makanji H**, Harris MB, Vrahas MS. Factors Associated with the Decision for Operative Versus Non-Operative Treatment of Displaced Proximal Humerus Fractures in the Elderly. *Injury.* 2013;44(4):448-455

Becker SJ, **Makanji HS**, Ring D. Expected and Actual Improvement of Symptoms with Carpal Tunnel Release. *J Hand Surg Am.* 2012;37(7):1324-1329

Cowan J, **Makanji H**, Mudgal C, Jupiter J, Ring D. Determinants of Return to Work After Carpal Tunnel Release. *J Hand Surg Am.* 2012;37(1):18-27

deLivron MA, **Makanji HS**, Lane MC, Robinson VL. A Novel Domain in the Translational GTPase BipA Mediates Interaction with the 70S Ribosome and Influences GTP Hydrolysis. *Biochemistry.* 2009;48(44):10533-10541

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*PRESENTATIONS, POSTERS, ABSTRACTS*

**Makanji HS**, Le H, Wood KB, Jenis LG, Cha TD (Presenter). Morphometric Analysis of the Retroperitoneal Vessels with Respect to Lateral Access Surgery in Adult Scoliosis. *The International Society for Study of the Lumbar Spine Annual Meeting.* Athens, Greece. 2017 (Poster)

**Makanji H**, Le H, Wood KB, Jenis LG, Cha TD (Presenter). Morphometric Analysis of the Retroperitoneal Vessels with Respect to Lateral Access Surgery in Adult Scoliosis. *Society of Lateral Access Surgery Annual Meeting.* San Diego, CA. 2015 (Presentation)

Becker SJ (Presenter), **Makanji HS**, Ring D. Changes in Treatment Plan for Carpal Tunnel Syndrome Based on Electrodiagnostic Test Results. *Annual Meeting of the American Academy of Orthopaedic Surgeons.* Chicago, IL. 2013 (Presentation)

**Makanji HS** (Presenter), Becker SJ, Mudgal C, Jupiter JB, Ring D. Evaluation of the Scratch Collapse Test for the Diagnosis of Carpal Tunnel Syndrome. *Annual Meeting of the American Association for Hand Surgery.* Naples, FL. 2013 (Poster)

Becker SJ (Presenter), **Makanji HS**, Ring D. Expected Improvement and Actual Improvement of Symptoms with Carpal Tunnel Release. *Annual Meeting of the American Society for Surgery of the Hand.* Chicago, IL. 2012 (Poster)

**Makanji HS** (Presenter). Electronic Informed Consent: A Method to Decrease Operating Room Delays and Improve Patient Education. *Innovation, Design, and Emerging Alliances in Surgery Poster Session, Beth Israel Deaconess Medical Center.* Boston, MA. 2012 (Poster)

**Makanji HS** (Presenter), Jupiter JB, Mudgal C, Ring D. Predictors of Normal Electrophysiological Testing for Carpal Tunnel Syndrome. *Annual Meeting of the New England Hand Society*. Sturbridge, MA. 2010 (Presentation)

**Makanji HS** (Presenter), deLivron MA, Robinson VL. An Allosteric Pathway Revealed in the Ribosome Binding Stress Factor BipA. *Annual Meeting of the Biophysical Society*. Boston, MA. 2009 (Poster)

deLivron MA (Presenter), Brown RS, **Makanji HS**, Robinson VL. The Novel C-Terminal Domain of Salmonella typhimurium BipA Mediates Hydrolysis Activity and Ribosome Binding. *North Eastern Structure Symposium*. Storrs, CT. 2008 (Poster)

deLivron, MA (Presenter), **Makanji HS**, Robinson VL. Stress Adaptation Promotes Differential Association of BipA with the Ribosome. *Translation Control Meeting*. Cold Spring Harbor, NY. 2008 (Poster)

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#### *BOOK CHAPTERS*

How to Revise a Nonunion of a Lateral Interbody Fusion through a Lateral Approach. *Revision Spine Surgery: Pearls and Pitfalls*.

When and How to Treat a Ventrally Displaced ALIF, TLIF or DLIF Graft. *Revision Spine Surgery: Pearls and Pitfalls*

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#### SOCIETY MEMBERSHIPS

Lumbar Spine Research Society: Candidate Member

International Society for the Advancement of Spine Surgery

Cervical Spine Research Society: Candidate Member

North American Spine Society: Member

American Academy of Orthopaedic Surgeons: Member