



## Angela K. Lumba-Brown

- Clinical Associate Professor, Emergency Medicine
- Clinical Associate Professor (By courtesy), Neurosurgery
- Clinical Associate Professor, Pediatrics

### Bio

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#### BIO

Dr. Lumba-Brown is an academic pediatric emergency medicine physician with expertise in neuroscience and neurocritical emergencies. She is an Associate Vice Chair of the Department of Emergency Medicine and the Clinical Research Unit Director (faculty). Dr. Lumba-Brown cares for children and young adults clinically in the pediatric emergency department and is board-specialized in pediatric emergency medicine. She is an Associate Professor of Emergency Medicine and, by courtesy, of Neurosurgery and Pediatrics.

Dr. Lumba-Brown is a national expert on traumatic brain injury and has led several large clinical care guidelines. She sits on the Board of Scientific Counselors for the Centers for Disease Control's (CDC) National Center for Injury Prevention and Control, a federal advisory committee. She is also an appointee to the Pac-12 Brain Trauma Task Force, guiding research and policy in athletes with head injury.

Dr. Lumba-Brown is the co-director of the Stanford Brain Performance Center where she works to advance the neuroscience of childhood development, injury, and aging through prevention, novel biomarker discovery and other diagnostics, and treatments.

#### ACADEMIC APPOINTMENTS

- Clinical Associate Professor, Emergency Medicine
- Clinical Associate Professor (By courtesy), Neurosurgery
- Clinical Associate Professor, Pediatrics
- Member, Maternal & Child Health Research Institute (MCHRI)

#### ADMINISTRATIVE APPOINTMENTS

- Clinical Research Unit Director (faculty), Stanford Emergency Medicine, (2022- present)
- Board of Scientific Counselors, Centers for Disease Control and Prevention, (2021- present)
- Brain Trauma Task Force, Pac-12, (2021- present)
- Co-Director, Stanford Brain Performance Center, (2018- present)
- Research Director, Stanford Brain Trauma Evidence-Based Consortium, (2017-2019)

#### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Workgroup to Improve the Clinical Care of Youth with Mild TBI, Centers for Disease Control and Injury Prevention (2011 - present)
- Mild TBI Definition Expert Consensus Group, American Congress of Rehabilitation Medicine (2019 - present)
- Editorial Board, *Frontiers in Neurology: Neurotrauma* (2020 - present)

- Editorial Board, Journal of the American College of Emergency Physicians (2019 - 2021)
- Chair, Committee for the Future, Section on Emergency Medicine, American Academy of Pediatrics (2015 - 2017)

## PROFESSIONAL EDUCATION

- Board Certification, American Board of Pediatrics , Pediatric Emergency Medicine (2013)
- PEM Fellowship, University of California San Diego, Rady Children's Hospital , Pediatric Emergency Medicine (2012)
- Board Certification, American Board of Pediatrics , General Pediatrics (2009)
- Residency, New York Medical College, Maria Fareri Children's Hospital , Pediatrics (2007)
- Internship, New York Medical College, Maria Fareri Children's Hospital , Pediatrics (2006)
- Medical Doctor (MD), St. George's University Medical School , Medicine (2006)

## COMMUNITY AND INTERNATIONAL WORK

- Stanford Sports Concussion Summit
- CDC Head Up Educational Materials

## PATENTS

- Vijay Lumba, Irwin Wunderman, Mearl Naponic, John Missanelli, Angela Lumba. "United States Patent US 20040082842 Lumba VK, Wunderman I, Naponic M, Missanelli J, Lumba AK. "System for Monitoring Fetal Status" Patent US 20040082842. April 2004.", Vijay Lumba, Apr 29, 2004

## LINKS

- Stanford Brain Performance Center: <http://med.stanford.edu/braincenter.html>
- New York Times: <https://www.nytimes.com/2018/09/17/well/family/children-concussions-brain-injuries-cdc-guidelines.html>
- National Public Radio (NPR): <https://www.npr.org/sections/health-shots/2018/12/03/672002830/kids-with-concussions-can-phase-in-exercise-screen-time-sooner-than-before>
- NPR News: <http://radio.wosu.org/post/wellness-wednesday-food-safety-kids-head-injuries-personality-types#stream/0>
- Stanford Sports Concussion Summit: [https://www.nbcbayarea.com/on-air/as-seen-on/Steve-Young--Attends-Concussion-Summit-at-Stanford\\_Bay-Area-509172472.html](https://www.nbcbayarea.com/on-air/as-seen-on/Steve-Young--Attends-Concussion-Summit-at-Stanford_Bay-Area-509172472.html)
- Concussion Subtypes: <https://stanfordmag.org/contents/the-5-types-of-concussions>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Dr. Lumba-Brown is a specialty-trained, board-certified pediatric emergency medicine physician working clinically in the Stanford Emergency Department and co-directing the Stanford Brain Performance Center.

Her research focuses on traumatic brain injury and brain performance. Dr. Lumba-Brown's previous scholarly work include: a prospective, double-blinded, randomized controlled trial evaluating therapeutic intervention in acute pediatric concussion (Peds Em Care 2014); complicated mild TBI risk score development (Pediatrics and others 2017); and a large systematic review and CDC guideline publication (JAMA Peds and others 2018); concussion subtype classification (Neurosurgery 2019 and others). Her current areas of active research include investigations of diagnosis, management, and therapeutic intervention in traumatic brain injury, subtype classification of concussion, and the pre-hospital management of mild-severe TBI. She also studies brain performance via sensorimotor and sensory-cognitive synchronization to address attentional impairments.

### CLINICAL TRIALS

- Hypertonic Saline as Therapy for Pediatric Concussion, Not Recruiting

## Publications

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### PUBLICATIONS

- **Journal update monthly top five.** *Emergency medicine journal : EMJ*  
Saxena, M., Altamirano, J., Rose, C., Bennett, C., Govindarajan, P., Lumba-Brown, A., Hirst, R.  
2022; 39 (7): 561-562
- **Risk of Concussion After a Targeting Foul in Collegiate American Football.** *Orthopaedic journal of sports medicine*  
Aukerman, D. F., Bohr, A. D., Poddar, S. K., Romano, R., Petron, D. J., Ghajar, J., Giza, C. C., Lumba-Brown, A., McQueen, M. B., Harmon, K. G.  
2022; 10 (2): 23259671221074656
- **A Review of Implementation Concepts and Strategies Surrounding Traumatic Brain Injury Clinical Care Guidelines.** *Journal of neurotrauma*  
Lumba-Brown, A., Prager, E. M., Harmon, N., McCrea, M., Bell, M. J., Ghajar, J., Pyne, S., Cifu, D.  
2021
- **Sex Differences in Common Measures of Concussion in College Athletes.** *The Journal of head trauma rehabilitation*  
Teramoto, M., Grover, E. B., Cornwell, J., Zhang, R., Boo, M., Ghajar, J., Lumba-Brown, A.  
2021
- **The Other Side.** *Emergency medicine journal : EMJ*  
Lumba-Brown, A.  
2021
- **External Lumbar Drainage following Traumatic Intracranial Hypertension: A Systematic Review and Meta-Analysis.** *Neurosurgery*  
Badhiwala, J., Lumba-Brown, A., Hawryluk, G. W., Ghajar, J.  
2021
- **Phenotyping the Spectrum of Traumatic Brain Injury: A Review and Pathway to Standardization.** *Journal of neurotrauma*  
Pugh, M. J., Kennedy, E., Prager, E. M., Humpherys, J., Dams-O'Connor, K., Hack, D., McCafferty, M. K., Wolfe, J., Yaffe, K. C., McCrea, M., Ferguson, A. R., Lancashire, L., Ghajar, et al  
2021
- **CDC Guideline on Mild Traumatic Brain Injury in Children: Important Practice Takeaways for Sports Medicine Providers** *CLINICAL JOURNAL OF SPORT MEDICINE*  
Sarmiento, K., Waltzman, D., Lumba-Brown, A., Yeates, K. O., Putukian, M., Herring, S.  
2020; 30 (6): 612–15
- **Mentoring Pediatric Victims of Interpersonal Violence Reduces Recidivism** *JOURNAL OF INTERPERSONAL VIOLENCE*  
Lumba-Brown, A., Batek, M., Choi, P., Keller, M., Kennedy, R.  
2020; 35 (21-22): 4262–75
- **Smooth Pursuit Eye-Movement Abnormalities Associated With Cervical Spine Whiplash: A Scientific Review and Case Report.** *Cureus*  
Boo, M., Matheson, G., Lumba-Brown, A.  
2020; 12 (8): e9872
- **Smooth Pursuit Eye-Movement Abnormalities Associated With Cervical Spine Whiplash: A Scientific Review and Case Report** *CUREUS*  
Boo, M., Matheson, G., Lumba-Brown, A.  
2020; 12 (8)
- **Emergency department treatment of asthma in children: A review** *JACEP Open*  
Lee, M. O., Sivasankar, S., Pokrajac, N., Smith, C., Lumba-Brown, A.  
2020
- **Guidelines for the Management of Severe Traumatic Brain Injury: 2020 Update of the Decompressive Craniectomy Recommendations.** *Neurosurgery*  
Hawryluk, G. W., Rubiano, A. M., Totten, A. M., O'Reilly, C. n., Ullman, J. S., Bratton, S. L., Chesnut, R. n., Harris, O. A., Kissoon, N. n., Shutter, L. n., Tasker, R. C., Vavilala, M. S., Wilberger, et al  
2020
- **Post-concussion symptom burden in children following motor vehicle collisions.** *Journal of the American College of Emergency Physicians open*

- Lumba-Brown, A. n., Tang, K. n., Yeates, K. O., Zemek, R. n.  
2020; 1 (5): 938–46
- **Sex-Related Differences in Neurosensory Alterations Following Blunt Head Injury.** *Frontiers in neurology*  
Lumba-Brown, A. n., Niknam, K. n., Cornwell, J. n., Meyer, C. n., Ghajar, J. n.  
2020; 11: 1051
  - **Emergency department implementation of abbreviated magnetic resonance imaging for pediatric traumatic brain injury.** *Journal of the American College of Emergency Physicians open*  
Lumba-Brown, A. n., Lee, M. O., Brown, I. n., Cornwell, J. n., Dannenberg, B. n., Fang, A. n., Ghazi-Askar, M. n., Grant, G. n., Imler, D. n., Khanna, K. n., Lowe, J. n., Wang, E. n., Wintermark, et al  
2020; 1 (5): 994–99
  - **Emergency Department Implementation of the Brain Trauma Foundation's Pediatric Severe Brain Injury Guideline Recommendations.** *Pediatric emergency care*  
Lumba-Brown, A., Totten, A., Kochanek, P. M.  
2019
  - **Practice Variation in the Diagnosis of Aneurysmal Subarachnoid Hemorrhage: A Survey of US and Canadian Emergency Medicine Physicians** *NEUROCRITICAL CARE*  
Kumar, A., Niknam, K., Lumba-Brown, A., Woodruff, M., Bledsoe, J. R., Kohn, M. A., Perry, J. J., Govindarajan, P.  
2019; 31 (2): 321–28
  - **Concussion Guidelines Step 2: Evidence for Subtype Classification.** *Neurosurgery*  
Lumba-Brown, A., Teramoto, M., Bloom, O. J., Brody, D., Chesnutt, J., Clugston, J. R., Collins, M., Gioia, G., Kontos, A., Lal, A., Sills, A., Ghajar, J.  
2019
  - **Reliable sideline ocular-motor assessment following exercise in healthy student athletes.** *Journal of science and medicine in sport*  
Sundaram, V., Ding, V. Y., Desai, M., Lumba-Brown, A., Little, J.  
2019
  - **Strengthening the Evidence Base: Recommendations for Future Research Identified Through the Development of CDC's Pediatric Mild TBI Guideline** *JOURNAL OF HEAD TRAUMA REHABILITATION*  
Suskauer, S. J., Yeates, K., Sarmiento, K., Benzel, E. C., Breiding, M. J., Broomand, C., Haarbauer-Krupa, J., Turner, M., Weissman, B., Lumba-Brown, A.  
2019; 34 (4): 215–23
  - **Practice Patterns in Pharmacological and Non-Pharmacological Therapies for Children with Mild Traumatic Brain Injury: A Survey of 15 Canadian and United States Centers** *JOURNAL OF NEUROTRAUMA*  
Mannix, R., Zemek, R., Yeates, K., Arbogast, K., Atabaki, S., Badawy, M., Beauchamp, M. H., Beer, D., Bin, S., Burstein, B., Craig, W., Corwin, D., Doan, et al  
2019
  - **Pediatric hypertonic saline use in emergency departments** *AMERICAN JOURNAL OF EMERGENCY MEDICINE*  
Niknam, K., Mistry, R., Lumba-Brown, A.  
2019; 37 (5): 981–83
  - **Practice Variation in the Diagnosis of Aneurysmal Subarachnoid Hemorrhage: A Survey of US and Canadian Emergency Medicine Physicians.** *Neurocritical care*  
Kumar, A., Niknam, K., Lumba-Brown, A., Woodruff, M., Bledsoe, J. R., Kohn, M. A., Perry, J. J., Govindarajan, P.  
2019
  - **North American survey on the post-neuroimaging management of children with mild head injuries** *JOURNAL OF NEUROSURGERY-PEDIATRICS*  
Greenberg, J. K., Jeffe, D. B., Carpenter, C. R., Yan, Y., Pineda, J. A., Lumba-Brown, A., Keller, M. S., Berger, D., Bollo, R. J., Ravindra, V. M., Naftel, R. P., Dewan, M. C., Shah, et al  
2019; 23 (2): 227–35
  - **Practice Variation in the Management of Aneurysmal Subarachnoid Hemorrhage-A Survey of US and Canadian Emergency Medicine Physicians**  
Kumar, A., Niknam, K., Lumba-Brown, A., Bledsoe, J., Woodruff, M., Kohn, M., Perry, J., Govindarajan, P.  
LIPPINCOTT WILLIAMS & WILKINS.2019
  - **Strengthening the Evidence Base: Recommendations for Future Research Identified Through the Development of CDC's Pediatric Mild TBI Guideline.** *The Journal of head trauma rehabilitation*

- Suskauer, S. J., Yeates, K. O., Sarmiento, K., Benzel, E. C., Breiding, M. J., Broomand, C., Haarbauer-Krupa, J., Turner, M., Weissman, B., Lumba-Brown, A.  
2019
- **Practice Patterns in Pharmacologic and Non-pharmacologic Therapies for Children with Mild Traumatic Brain Injury: A survey of 15 Canadian and United States Centers.** *Journal of neurotrauma*  
Mannix, R. n., Zemek, R. n., Yeates, K. O., Arbogast, K. B., Atabaki, S. n., Badawy, M. n., Beauchamp, M. H., Beer, D. n., Bin, S. n., Burstein, B. n., Craig, W. n., Corwin, D. n., Doan, et al  
2019
  - **Representation of concussion subtypes in common postconcussion symptom-rating scales.** *Concussion (London, England)*  
Lumba-Brown, A. n., Ghajar, J. n., Cornwell, J. n., Bloom, O. J., Chesnutt, J. n., Clugston, J. R., Kolluri, R. n., Leddy, J. J., Teramoto, M. n., Gioia, G. n.  
2019; 4 (3): CNC65
  - **Concussion Subtype Identification With the Rivermead Post-concussion Symptoms Questionnaire.** *Frontiers in neurology*  
Maruta, J., Lumba-Brown, A., Ghajar, J.  
2018; 9: 1034
  - **Concussion Subtype Identification With the Rivermead Post-concussion Symptoms Questionnaire** *FRONTIERS IN NEUROLOGY*  
Maruta, J., Lumba-Brown, A., Ghajar, J.  
2018; 9
  - **CDC Guideline on Mild Traumatic Brain Injury in Children: Important Practice Takeaways for Sports Medicine Providers.** *Clinical journal of sport medicine : official journal of the Canadian Academy of Sport Medicine*  
Sarmiento, K., Waltzman, D., Lumba-Brown, A., Yeates, K. O., Putukian, M., Herring, S.  
2018
  - **Centers for Disease Control and Prevention Guideline on the Diagnosis and Management of Mild Traumatic Brain Injury Among Children** *JAMA PEDIATRICS*  
Lumba-Brown, A., Yeates, K., Sarmiento, K., Breiding, M. J., Haegerich, T. M., Gioia, G. A., Turner, M., Benzel, E. C., Suskauer, S. J., Giza, C. C., Joseph, M., Broomand, C., Weissman, et al  
2018; 172 (11)
  - **Development of the CIDSS2 Score for Children with Mild Head Trauma without Intracranial Injury** *JOURNAL OF NEUROTRAUMA*  
Greenberg, J. K., Yan, Y., Carpenter, C. R., Lumba-Brown, A., Keller, M. S., Pineda, J. A., Brownson, R. C., Limbrick, D. D.  
2018; 35 (22): 2699–2707
  - **Emergency Department Implementation of the Centers for Disease Control and Prevention Pediatric Mild Traumatic Brain Injury Guideline Recommendations** *ANNALS OF EMERGENCY MEDICINE*  
Lumba-Brown, A., Wright, D. W., Sarmiento, K., Houry, D.  
2018; 72 (5): 581–85
  - **Diagnosis and Management of Mild Traumatic Brain Injury in Children A Systematic Review** *JAMA PEDIATRICS*  
Lumba-Brown, A., Yeates, K., Sarmiento, K., Breiding, M. J., Haegerich, T. M., Gioia, G. A., Turner, M., Benzel, E. C., Suskauer, S. J., Giza, C. C., Joseph, M., Broomand, C., Weissman, et al  
2018; 172 (11)
  - **Pediatric hypertonic saline use in emergency departments.** *The American journal of emergency medicine*  
Niknam, K., Mistry, R., Lumba-Brown, A.  
2018
  - **Centers for Disease Control and Prevention Guideline on the Diagnosis and Management of Mild Traumatic Brain Injury Among Children.** *JAMA pediatrics*  
Lumba-Brown, A., Yeates, K. O., Sarmiento, K., Breiding, M. J., Haegerich, T. M., Gioia, G. A., Turner, M., Benzel, E. C., Suskauer, S. J., Giza, C. C., Joseph, M., Broomand, C., Weissman, et al  
2018: e182853
  - **Diagnosis and Management of Mild Traumatic Brain Injury in Children: A Systematic Review.** *JAMA pediatrics*  
Lumba-Brown, A., Yeates, K. O., Sarmiento, K., Breiding, M. J., Haegerich, T. M., Gioia, G. A., Turner, M., Benzel, E. C., Suskauer, S. J., Giza, C. C., Joseph, M., Broomand, C., Weissman, et al  
2018: e182847

- **Mentoring Pediatric Victims of Interpersonal Violence Reduces Recidivism.** *Journal of interpersonal violence*  
Lumba-Brown, A., Batek, M., Choi, P., Keller, M., Kennedy, R.  
2017; 886260517705662
- **Development and Internal Validation of a Clinical Risk Score for Treating Children With Mild Head Trauma and Intracranial Injury.** *JAMA pediatrics*  
Greenberg, J. K., Yan, Y., Carpenter, C. R., Lumba-Brown, A., Keller, M. S., Pineda, J. A., Brownson, R. C., Limbrick, D. D.  
2017
- **Service Delivery in the Healthcare and Educational Systems for Children Following Traumatic Brain Injury: Gaps in Care.** *The Journal of head trauma rehabilitation*  
Haarbauer-Krupa, J., Ciccio, A., Dodd, J., Ettl, D., Kurowski, B., Lumba-Brown, A., Suskauer, S.  
2017
- **183 A Clinical Risk Score for Managing Children With Glasgow Coma Scale 13 to 15 Head Injuries and Intracranial Injury.** *Neurosurgery*  
Greenberg, J. K., Yan, Y., Carpenter, C., Lumba-Brown, A., Keller, M. S., Pineda, J. A., Brownson, R. C., Limbrick, D. D.  
2016; 63: 172-173
- **PEMNetwork Barriers and Enablers to Collaboration and Multimedia Education in the Digital Age** *PEDIATRIC EMERGENCY CARE*  
Lumba-Brown, A., Tat, S., Auerbach, M. A., Kessler, D. O., Alletag, M., Grover, P., Schnadower, D., Macias, C. G., Chang, T. P.  
2016; 32 (8): 565-569
- **Essentials of PEM Fellowship Part 2: The Profession in Entrustable Professional Activities** *PEDIATRIC EMERGENCY CARE*  
Hsu, D., Nypaver, M., Fein, D. M., McAneney, C., Santen, S., Nagler, J., Zuckerbraun, N., Roskind, C. G., Reynolds, S., Zaveri, P., Stankovic, C., House, J. B., Langhan, et al  
2016; 32 (6): 410-418
- **Firearm injuries in the pediatric population: A tale of one city** *JOURNAL OF TRAUMA AND ACUTE CARE SURGERY*  
Choi, P. M., Hong, C., Bansal, S., Lumba-Brown, A., Fitzpatrick, C. M., Keller, M. S.  
2016; 80 (1): 64-69
- **Emergency Neurological Life Support: Traumatic Brain Injury** *NEUROCRITICAL CARE*  
Garvin, R., Venkatasubramanian, C., Lumba-Brown, A., Miller, C. M.  
2015; 23: S143-S154
- **Emergency Neurological Life Support: Traumatic Brain Injury.** *Neurocritical care*  
Garvin, R., Venkatasubramanian, C., Lumba-Brown, A., Miller, C. M.  
2015; 23 Suppl 2: S143-54
- **Evidence-Based Assessment of Severe Pediatric Traumatic Brain Injury and Emergent Neurocritical Care** *SEMINARS IN PEDIATRIC NEUROLOGY*  
Lumba-Brown, A., Pineda, J.  
2014; 21 (4): 275-283
- **Hypertonic saline as a therapy for pediatric concussive pain: a randomized controlled trial of symptom treatment in the emergency department.** *Pediatric emergency care*  
Lumba-Brown, A., Harley, J., Lucio, S., Vaida, F., Hilfiker, M.  
2014; 30 (3): 139-145

## PRESENTATIONS

- NFL Concussion Panel - 2018 Advances in Neuroscience 9th Bay Area Symposium
- Subtypes of Concussion: DoD Provider Training - National Department of Defense Provider Training
- Research Keynote: Classification of Concussion - TBI Symposium, OHSU Brain Institute
- Mild TBI Guidelines for the CDC National Health Providers - Centers for Disease Control and Injury Prevention
- Management of Status Epilepticus in Children - 2016 ACEP Advanced Pediatric Emergency Medicine Assembly (3/1/2016)
- The Clinical Management of Pediatric Seizure - Washington University Pediatric Emergency Medicine Symposium (9/1/2016)
- Morsels and More: Update on Online Educational Tools and the PEMNetwork - Pediatric Emergency Medicine Fellows' Conference (3/1/2015)
- Concussion: Making the Diagnosis and Making the Discharge Plan - Pediatric Academic Societies Annual Conference (5/1/2014)

- Establishing Evidence for the Subtypes of Concussion - Brain Injury Summit
- The Prevalence of Concussion Subtypes - Military Health Science Research Symposium (8/22/2018)
- Brain Freeze: Fact Versus Fiction in Concussion Return to Play - 2016 ACEP Advanced Pediatric Emergency Medicine Assembly (3/1/2016)
- Evidence for Concussion Subtypes - 2018 Advances in Neurosciences 9th Bay Area Symposium
- Head Injury Guideline Materials for Children - State of Hawaii Department of Health (2/14/2020)
- The ED Management of Head Injury in Children - Dell Children's Hospital (3/4/2020)
- Hypertonic Saline and Strategies for the Management of Traumatic Brain Injury in Children - Grand Rounds, Dell Children's Hospital (3/4/2020)
- Update on Care of Pediatric Emergencies, Trauma, Resuscitation - National Conference Webinar (April 24, 2020)