



## Angela K. Lumba-Brown

Clinical Associate Professor, Emergency Medicine

### Bio

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#### BIO

Dr. Lumba-Brown is an academic pediatric emergency medicine physician with expertise in traumatic brain injury and neurocritical emergencies. She cares for children and young adults clinically in the Stanford Pediatric Emergency Department. Dr. Lumba-Brown is a national expert on concussion in children and has led several recent large guideline projects. She is also the co-director of the Stanford Brain Performance Center.

#### ACADEMIC APPOINTMENTS

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

#### ADMINISTRATIVE APPOINTMENTS

- Co-Director, Stanford Brain Performance Center, (2018- present)
- Co-Investigator, Stanford Brain Trauma Evidence-Based Consortium, (2017- present)

#### 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)
- 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 Concussion and 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)

## 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 mild traumatic brain injury, subtype classification of concussion, and the pre-hospital management of severe TBI. She also studies brain performance via sensorimotor and sensory-cognitive synchronization.

### CLINICAL TRIALS

- Hypertonic Saline as Therapy for Pediatric Concussion, Not Recruiting

## Publications

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### PUBLICATIONS

- **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., Goyindarajan, 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., Zemek, R., Yeates, K. O., Arbogast, K. B., Atabaki, S., Badawy, M., Beauchamp, M. H., Beer, D., Bin, S., Burstein, B., Craig, W., Corwin, D., Doan, et al  
2019
- **Representation of concussion subtypes in common postconcussion symptom-rating scales.** *Concussion (London, England)*  
Lumba-Brown, A., Ghajar, J., Cornwell, J., Bloom, O. J., Chesnutt, J., Clugston, J. R., Kolluri, R., Leddy, J. J., Teramoto, M., Gioia, G.  
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
- **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
- **Concussion Subtype Identification With the Rivermead Post-concussion Symptoms Questionnaire.** *Frontiers in neurology*  
Maruta, J., Lumba-Brown, A., Ghajar, J.  
2018; 9: 1034
- **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
- **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
- **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
- **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
- The Clinical Management of Pediatric Seizure - Washington University Pediatric Emergency Medicine Symposium (9/1/2016)
- Management of Status Epilepticus in Children - 2016 ACEP Advanced Pediatric Emergency Medicine Assembly (3/1/2016)
- 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