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2024 NEUROSURGERY RESIDENCY AT BRIGHAM AND WOMEN'S HOSPITAL, BOSTON CHILDREN HOSPITAL, AND HARVARD MEDICAL SCHOOL



Mass General Brigham



Boston Children's Hospital



HARVARD MEDICAL SCHOOL

NEUROSURGERY RESIDENCY

ALUMNI 2004-2024
FACULTY RESEARCH &
PUBLICATIONS 2020- 2024

INTRODUCTION



Thank you for your interest in the Neurosurgery Residency Program of Brigham and Women's Hospital, Boston Children's Hospital and Harvard Medical School. In our program, trainees are exposed to a wealth of neurosurgical pathology. Residents learn the fundamentals of surgical skills, the care of critically ill patients, and the principles of neurologic evaluation, differential diagnosis and interpretation of neuro-imaging. These goals are facilitated by clinical rotations on ancillary services and in the various neurosurgery hospital services. A rich and graduated neurosurgical experience and close mentorship by the thirty-nine clinical faculty allow the development and maturation of outstanding operating skills. Technical and clinical experiences are complemented by emphasis on clinical judgment, evidence-based outcome assessment, and thoughtful analysis of morbidity. These and core neuroscience educational objectives are covered at scheduled weekly conferences, in bedside teaching and in the operating room. Brigham and Women's Neurosurgery Residency Program is committed to providing two years of basic or clinical research time to enhance your development

as future academic neurosurgeons. We encourage participation at national meetings and have numerous visiting professors come to Boston to interface with our trainees.

WE ARE COMMITTED TO ADDING VALUE TO EVERY FACET OF YOUR TRAINING.

On behalf of each faculty member of the Department of Neurosurgery and our team of residents, we can affirm that we have no mission more sacred than that of training the next generation of neurosurgeons. Specific educational curriculum objectives shall guide your development at every stage. You shall be taught and individually mentored, and critiqued, but also asked to evaluate us and help the Program integrate numerous educational and clinical innovations. Most of all, you will grow into a surgically skilled and academically-oriented neurosurgeon, positioned to be a future leader in the world of neurosurgery.

While a student clerkship experience in our Department is not required for application, it is highly recommended, as it will allow us to get better acquainted. Rotations can be arranged at any time during the junior or senior medical student years. Visit www.brighamandwomens.org/nsresidency to learn more about our program. Please do not hesitate to contact us directly at any stage of the application and matching process if we can answer any of your questions about the BWH/BCH/HMS Residency Program.

Sincerely,

G. REES COSGROVE, MD, FRCSC, FAANS
RESIDENCY PROGRAM DIRECTOR,
BRIGHAM AND WOMEN'S HOSPITAL,
BOSTON CHILDREN'S HOSPITAL,
HARVARD MEDICAL SCHOOL

PARTNERING INSTITUTIONS

Mass General Brigham

Mass General Brigham is an integrated academic health care system dedicated to advancing patient care, research, and education. It connects a full continuum of care, including academic medical centers, community and specialty hospitals, physician networks, home care, and long-term care services. Committed to addressing the toughest challenges in medicine, Mass General Brigham is a nonprofit organization serving both local communities and global needs. As a leading biomedical research institution and principal teaching affiliate of Harvard Medical School, it brings together top minds to drive innovation and improve health outcomes.

Boston Children's Hospital

Boston Children's Hospital has the largest training program for pediatricians and pediatric subspecialists in the country. Every year, 400 of the country's best and brightest medical and surgical trainees come to Boston Children's from around the world; more than half come from the top medical schools.

HARVARD MEDICAL SCHOOL

Established in 1782, Harvard Medical School began with a handful of students and a faculty of three. The first classes were held in Harvard Hall in Cambridge, long before the school's iconic quadrangle was built in Boston. With each passing decade, the school's faculty and trainees amassed knowledge and influence, shaping medicine in the United States and beyond. Some community members -and their accomplishments- have assumed the status of legend. Today, the School continues to enhance its curriculum to meet the needs of 21st century medicine by integrating clinical and basic science across the curriculum, developing new models for clinical education and engaging students in an in-depth scholarly experience.

In memory of R. Michael Scott, MD



February 19, 1941 – August 4, 2023



This book is dedicated to Dr. R Michael Scott who passed away this past August. Dr. Scott was a brilliant neurosurgeon and researcher who greatly contributed to the study of vascular malformations of the brain in pediatric patients and neurosurgical treatment of stroke in children.

Dr. Scott was a known leader, teacher, and mentor across Boston Children's, Harvard Medical School, and Brigham and Women's. We thank him for his years of dedication to his patients, our team, and to the neurosurgery field as a whole.

OUR ALUMNI, 1913-2003

1913	Charles E. Dowman, Jr.	1923-1925	R. Glen Spurling	1927-1929	Ignaz Oljenick	1931-1932	Bronson Ray	1956-1959	Ernest Matthews	1979-1984	Robert M. Beatty
1913	Frederic Bremer	1923-1924	Tracy J. Putnam	1927-1928	Dmitri Bagdesar	1931-1932	Richard U. Light	1958-1960	Robert Shick	1980-1984	Stephen Ofori-Kwakye
1913	John J. Morton	1924	Geoffrey Jefferson	1927-1928	John F. Fulton	1932	Francis Murphey	1959-1962	John T. Garner	1981-1986	Gregory W. Hornig
1913-1914	Wilder Penfield	1924-1925	William P. Van Wagenen	1928-1929	W. Gayle Crutchfield	1932	C. C. Bishop	1960-1964	Francis X. Rockett	1982-1987	John R. Adler, Jr.
1918-1919		1925	Arthur van Dessel	1928-1929	Frederic Schreiber	1932	D. Vasiliu	1961	August W. Geise	1983-1985	Luis M. Zavala-Roman
1913-1914	Charles Bagley Jr.	1925	Boris M. Fried	1928-1929	Harold M. Teel	1932	Arsit A. Stender	1962-1963	Eric Wisiol	1984-1989	Richard Ellenbogen
1913-1914	Carl W. Rand	1925-1926	Jean Morelle	1928-1929	Richard C. Buckley	1932	Ferdinand Verbeek	1962-1963	David L. Kelly, Jr.	1985-1988	Robert Peterson
1914-1916	Gilbert Horrax	1925-1926	Leo M. Davidoff	1928-1929	Alan C. Gairdner	1932	F. N. Glenn	1962-1966	Larry K. Page	1986-1991	Clifford M. Gall
1919-1928		1925-1926	Francis C. Grant	1928-1929	Edwan M. Deery	1932	L. C. Kendall	1963	Ronald Birkenfeld	1987-1992	Matthew R. Moore
1928-1932		1925-1928	Franc D. Ingraham	1928-1934	Louise Eisenhardt	1932	Vittorio Putti	1963-1965	Michael J. Jerva	1988-1995	Sumeer Sathi
1914-1915	Edward B. Towne	1926	Walter Lehmann Gottingen	1929	A. Herbert Olivecrona	1932	Arthur L. D. Pattison	1963-1967	Edward L. Katz	1989-1995	Philip A. Starr
1914-1915	L.H. Weed	1926	Edgar J. Fincher, Jr.	1929	Attracta Halpenny	1932-1933	Lycergus Davey	1964-1968	Alan D. Rosenthal	1990-1992	Patrick A. Juneau III
1915-1918	Clifford B. Walker	1926	William J. German	1929	F. A. R. Stammers	1933	Edvard Busch	1964-1965	Donliin M. Long	1990-1996	Simcha J. Weller
1915-1917	Conrad Jacobson	1926-1928	Hugh W. B. Cairns	1929-1930	Gaston de Coppet	1939-1942	Eben Alexander, Jr.	1966-1970	Howard M. Eisenberg	1991-1995	P. Langham Gleason
1916-1917	Samuel C. Harvey	1926-1927	Georges Schaltenbrand	1930	Daniel Petit-Dutailis	1946-1947	Donald Matson	1967-1968	John M. Tew	1991-1996	Faith Barnett
1917-1919	Henry R. Viets	1926-1927	Claude S. Beck	1930	Daniel C. Bell	1939-1943	Donald Matson	1967-1971	Edwin G. Fischer	1991-1997	Thomas Moriarty
1917-1920	J.J. Keegan	1927	Lawrence B. Kubie	1930-1931	William R. Henderson	1946-1947	Frank Nulsen	1968-1971	Robin Davidson	1992-1997	Marc. S. Schwartz
1919-1920	Howard Fleming	1927	Arthur J. McLean	1930-1931	Thomas I. Hoen	1941-1944	Griffith R. Harsh, III	1968-1969	A. Loren Amacher	1992-1998	John K. Park
1919	Percival Bailey	1927-1928	Trygve Gunderson	1930-1931	Francois Ody	1942-1944	John J. Lowrey	1968-1969	J. Gordon McComb	1992-1998	Craig van Horne
1922-1925		1927-1928	Cameron L. Haight	1930-1931	Thomas Hoen	1948-1949	Albert Farley	1970-1974	John W. Walsh	1993-1999	Subu N. Magge
1926-1928		1927-1928	Joseph Barr	1930-1931	Johannes Rives Tartu	1949-1950	Anthony Susen	1970-1975	James E. McLennan	1993-2000	Kai U. Frerichs
1920-1921	Charles E. Locke	1927-1928	Richard H. Meagher	1931-1932	Bronson Ray	1949-1953	Edgar Bering	1972-1978	Thomas Arkins	1995-2001	Adel Malek
1920	Charles P. Symonds	1927-1928	John G. Scarff	1931-1932	Carl F. List	1949-1952	Robert Mc Laurin	1972-1976	J. Parker Mickle	1996-2003	Peng Chen
1920	F. E. B. Foley	1927-1928	Cobb Pilcher	1931-1932	Abraham Kaplan	1950-1953	John Shillito, Jr.	1975-1977	Dennis L. Johnson	1996-2000	Claudia Martin
1921-1922	Daniel W. Wheeler	1927-1928	E. Jefferson Browder	1931-1932	Benno Schlesinger	1953-1957	E. Bruce Hendrick	1975-1979	Joseph Ordia	1999-2000	Steven P. Leon
1921-1922	Paul Martin	1927-1928	Cyril B. Courville	1931-1932	Robert A. Groff	1953-1959	Fred Fowler	1976-1980	David C. Y. Kung	2001-2002	Alexandra Golby
1923	J. Paterson Ross	1927-1928	Frederick E. Kredel	1931-1932	William (C. G.) de Gutierrez-Mahoney	1954-1956	Walt Cotter	1997-1980	Clarence S. Greene		
1923	Ferdinand C. Lee					1954-1961					
1923-1924	Norman M. Dott										
1929											

CLASS OF 2004



KADIR ERKMEN, MD

MEDICAL SCHOOL
University of Maryland School of Medicine

FELLOWSHIP
Skull Base Surgery, University of Arkansas
Neuroendovascular Surgery, University of Texas

SUBSEQUENT EMPLOYMENT
Faculty, Dartmouth Hitchcock Medical Center

CURRENT EMPLOYMENT
Director of Cerebrovascular Neurosurgery
& Neurosurgery Residency Program, Temple University



STEPHANIE GREENE, MD

MEDICAL SCHOOL
Albany Medical College

FELLOWSHIP
Pediatric Neurosurgery,
University of Washington Children's Hospital

SUBSEQUENT EMPLOYMENT
Director of Pediatric
Neurosurgery, Hasbro Children's Hospital

CURRENT EMPLOYMENT
Faculty, University of Pittsburgh

CLASS OF 2006



IAN JOHNSON, MD

MEDICAL SCHOOL
University of Kentucky School of Medicine

FELLOWSHIP
Orthopedic Spine Surgery, New England Baptist Hospital
Minimally Invasive Spine Surgery, Good Samaritan Hospital

SUBSEQUENT EMPLOYMENT
Faculty, Neurological Surgery, The Medical University of South Carolina, North Broward Health Coral Springs Medical

CURRENT EMPLOYMENT
Chief of Neurosurgery,
University Neuroscience Institute, UCSF-Fresno



DEEPA SONI, MD

MEDICAL SCHOOL
Howard University

FELLOWSHIP
Cerebrovascular, Macquarrie University

SUBSEQUENT EMPLOYMENT
Faculty, Berkshire Medical Center

CLASS OF 2005



CHIMA OHAEBULAM, MD

MEDICAL SCHOOL
University of Nigeria Medical School

FELLOWSHIP
Spinal Neurosurgery, Brigham and Women's Hospital

SUBSEQUENT EMPLOYMENT
Faculty, New England Baptist Hospital

CLASS OF 2007



BRYAN FIGUEROA, MD

MEDICAL SCHOOL
University of Michigan

FELLOWSHIP
Cerebrovascular Surgery,
Indianapolis Neurosurgical Group

SUBSEQUENT EMPLOYMENT
Staff, Spectrum Health



JONATHAN SLOTKIN, MD

MEDICAL SCHOOL
University of Maryland School of Medicine

FELLOWSHIP
Spine Surgery, New England Baptist Hospital

SUBSEQUENT EMPLOYMENT
The Washington Brain & Spine Institute

CURRENT EMPLOYMENT
Chief of Spine Surgery and Spinal Cord Injury Research, Geisinger Medical Center

CLASS OF 2008



SATHISH SUBBIAH, MD, MS

MEDICAL SCHOOL
Harvard Medical School

GRADUATE
Yale University

FELLOWSHIP
Endoscopic/Minimally Invasive Spine
Surgery, Northwestern Memorial Hospital

SUBSEQUENT EMPLOYMENT
Faculty, Mount Sinai School of Medicine
Practice, Orthopedic Associates of Long Island

CLASS OF 2010



LANCE GOVERNALE, MD

MEDICAL SCHOOL
Harvard Medical School

FELLOWSHIP
Shillito Pediatric Fellow, Boston Children's Hospital

SUBSEQUENT EMPLOYMENT
Faculty, Nationwide Children's Hospital, Ohio
State

CURRENT EMPLOYMENT
Chief of Pediatric Neurosurgery, University of
Florida



ALBERT KIM, MD, PHD

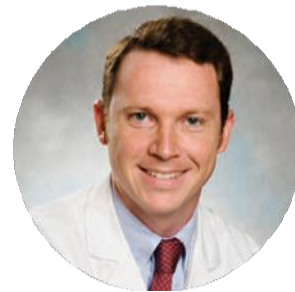
MEDICAL SCHOOL
New York University

GRADUATE/PHD
New York University

FELLOWSHIP
Skull Base/Vascular, Jackson Memorial
Hospital

SUBSEQUENT EMPLOYMENT
Faculty, Washington University

CLASS OF 2009



IAN DUNN, MD

MEDICAL SCHOOL
Harvard Medical School

FELLOWSHIP
Skull Base Surgery, University of Arkansas

SUBSEQUENT EMPLOYMENT
Faculty, Brigham and Women's Hospital

CURRENT EMPLOYMENT
Wilkins Professor and Chair of the
Department of Neurosurgery, University of
Oklahoma



ALEX PAPANASTASSIOU, MD

MEDICAL SCHOOL
University of California, San Francisco

FELLOWSHIP
Epilepsy, Yale University

SUBSEQUENT EMPLOYMENT
Faculty, University of Texas

CLASS OF 2011



KEVIN CAHILL, MD, PHD

MEDICAL SCHOOL
University of Florida

GRADUATE/PHD
Harvard School of Public Health/University of
Florida

FELLOWSHIP
Spine, University of Miami

SUBSEQUENT/CURRENT EMPLOYMENT
Private Practice, Carolina Neurosurgery & Spine



SUZANNE THARIN, MD, PHD

MEDICAL SCHOOL
Columbia University

GRADUATE/PHD
University of Toronto, SUNY Stony Brook

FELLOWSHIP
Spine, Cleveland Clinic

SUBSEQUENT/CURRENT EMPLOYMENT
Faculty, Stanford University Medical Center

CLASS OF 2012



SARAH JERNIGAN, MD

MEDICAL SCHOOL
University of Louisville

GRADUATE/PHD
Tulane University

FELLOWSHIP
Shillito Pediatric Fellow, Boston Children's Hospital

SUBSEQUENT/CURRENT EMPLOYMENT
Private Practice, Carolina Neurosurgery & Spine



YI LU, MD, PHD

MEDICAL SCHOOL
Columbia University

GRADUATE/PHD
Albert Einstein College of Medicine

FELLOWSHIP
Deformity & Minimally Invasive Spine Surgery, University of Miami

SUBSEQUENT/CURRENT EMPLOYMENT
Faculty, Brigham and Women's Hospital/Faulkner Hospital

CLASS OF 2014



STEPHEN NALBACH, MD

MEDICAL SCHOOL
Temple University

SUBSEQUENT/CURRENT EMPLOYMENT
Private Practice, Tyler Neurosurgical Associates, TX



ALEXANDER ROPPER, MD

MEDICAL SCHOOL
Tufts University

FELLOWSHIP
Spine Fellowship, Barrow Neurological Institute

CURRENT EMPLOYMENT
Director of Spine Surgery, Assistant Professor, Baylor College of Medicine, Texas



JUDITH WONG, MD, MPH

MEDICAL SCHOOL
University of California, San Francisco

GRADUATE/MPH
Harvard School of Public Health

FELLOWSHIP
Pediatric Fellowship, University of California Los Angeles

CURRENT EMPLOYMENT
Private Practice, Kaiser Permanente, California

CLASS OF 2013



NING LIN, MD

MEDICAL SCHOOL
Harvard Medical School

FELLOWSHIP
Endovascular Neurosurgery, SUNY Buffalo, NY

SUBSEQUENT EMPLOYMENT
Faculty, Well Cornell Medicine Brain and Spine Center, NY



URVASHI UPADHYAY, MD

MEDICAL SCHOOL
Johns Hopkins School of Medicine

FELLOWSHIP
Skull Base Surgery, Brigham and Women's Hospital

CURRENT EMPLOYMENT
Faculty, Boston Medical Center

CLASS OF 2015



BRADLEY GROSS, MD

MEDICAL SCHOOL
Northwestern University

FELLOWSHIP
Neuroendovascular
Fellowship, Barrow
Neurological Institute

CURRENT EMPLOYMENT
Assistant Professor, University of
Pittsburgh



PELEG HOROWITZ, MD, PHD

MEDICAL SCHOOL
Northwestern University

FELLOWSHIP
Skull Base Neuro-Oncology
Fellowship, MD Anderson Cancer
Center

CURRENT EMPLOYMENT
Assistant Professor, University of
Chicago

CLASS OF 2017



WENYA LINDA BI, MD, PHD

MEDICAL SCHOOL
Yale School of Medicine

FELLOWSHIP
Skull Base Fellowship, Brigham and Women's
Hospital

CURRENT EMPLOYMENT
Faculty, Brigham and Women's Hospital



MATTHEW VESTAL, MD, MHS

MEDICAL SCHOOL
Yale School of Medicine

POST-GRADUATE
Harvard Business School, MBA

FELLOWSHIP
Shillito Pediatric Fellow, Boston Children's
Hospital

CURRENT EMPLOYMENT
Assistant Professor, Duke University Medical
Center

CLASS OF 2016



MUHAMMAD ABD-EL-BARR, MD, PHD

MEDICAL SCHOOL
Baylor College of Medicine

FELLOWSHIP
Spine Fellowship, Brigham and Women's Hospital

CURRENT EMPLOYMENT
Faculty, Duke University Medical Center



MICHAEL RABER, MD

MEDICAL SCHOOL
Wake Forest University School of Medicine

FELLOWSHIP
Spine Fellowship, The Johns Hopkins
University

CURRENT EMPLOYMENT
Kootanai Clinic, Neurosurgery and
Spine, Coeur d'Alene, Idaho

CLASS OF 2018



HORMUZDIYAR DASENBROCK, MD

MEDICAL SCHOOL
Johns Hopkins University School of Medicine

FELLOWSHIP
Endovascular Fellowship, Rush University
Neuroendovascular Fellowship (enfolded), Brigham
and Women's Hospital

CURRENT EMPLOYMENT
Faculty, Boston Medical Center



VIREN VASUDEVA, MD

MEDICAL SCHOOL
Medical College of Georgia School of
Medicine

FELLOWSHIP
Spine Fellowship (enfolded), Brigham and
Women's Hospital, MA

CURRENT EMPLOYMENT
St. Mary's Healthcare System, Georgia
Neurological Surgery and Comprehensive
Spine, Athens, GA

CLASS OF 2019



VAMSIDHAR CHAVAKULA, MD

MEDICAL SCHOOL
Harvard Medical School

FELLOWSHIP
BWH Functional Attending, Fellowship
Epilepsy Fellowship, Claudio Munari Epilepsy
Center, Ospedale Niguarda, Milan, Italy

CURRENT EMPLOYMENT
Faculty, Neurosurgical Medical Clinic, San Diego,
California



ZIEV MOSES, MD

MEDICAL SCHOOL
Geisel School of Medicine at Dartmouth

FELLOWSHIP
Spine Fellowship, Rush University

CURRENT EMPLOYMENT
Faculty, Beth Israel Deaconess Medical Center,
Boston



POKMENG (ALFRED) SEE, MD

MEDICAL SCHOOL
Johns Hopkins University

FELLOWSHIP
Cerebrovascular Fellowship, University of Illinois at
Chicago

Shillito Fellowship, Boston Children's Hospital

CURRENT EMPLOYMENT
Faculty, Boston Children's Hospital

CLASS OF 2020



DUSTIN DONNELLY, MD

MEDICAL SCHOOL
The Ohio State University College of
Medicine

FELLOWSHIP
Spine Fellowship, Duke University

CURRENT EMPLOYMENT
Faculty, Case Western Reserve University



DAVID PENN, MD

MEDICAL SCHOOL
Sidney Kimmel Medical
College, Thomas Jefferson
University

FELLOWSHIP
Skull Base/ Cerebrovascular
Fellowship, Case Western Reserve
University

CURRENT EMPLOYMENT
Attending, Vassar Brothers Medical Center and
Danbury Hospital, Nuance Health, Poughkeepsie
NY



CHRISTIAN STRONG, MD

MEDICAL SCHOOL
Harvard Medical School

FELLOWSHIP
Spine Fellowship, New England Baptist
Hospital

CURRENT EMPLOYMENT
Strong Neurosurgery Consulting, Atlanta, GA

CLASS OF 2021



KEVIN TED HUANG, MD

MEDICAL SCHOOL
Duke University School of Medicine

FELLOWSHIP
Complex Spine Fellowship, Cleveland Clinic

SUBSEQUENT EMPLOYMENT
Faculty, Brigham and Women's Hospital



IAN JAMES TAFEL, MD

MEDICAL SCHOOL
Geisinger Commonwealth School of Medicine

FELLOWSHIP
Spine Fellowship, University of Miami

SUBSEQUENT EMPLOYMENT
Faculty, University of Florida Health



PABLO ANDRES VALDES QUEVEDO, MD, PHD

MEDICAL SCHOOL
Geisel School of Medicine at Dartmouth

FELLOWSHIP
Neurosurgical Oncology and Functional Brain Mapping Fellowship, Montpellier, France

SUBSEQUENT EMPLOYMENT
Assistant Professor, University of Texas Medical Branch

CLASS OF 2022



YASSER JEELANI, MD

MEDICAL SCHOOL
University of Jammu, India

FELLOWSHIP
Skull Base and Open CV Fellowship, Arkansas Neuroscience Institute

CURRENT EMPLOYMENT
Hackensack Meridian Health, Edison, NJ



ROSALIND LAI, MD

MEDICAL SCHOOL
Harvard Medical School

FELLOWSHIP
Cerebrovascular/Endovascular Fellowship, University at Buffalo, Neurosurgery (UBNS)

SUBSEQUENT EMPLOYMENT
Faculty, University at Buffalo, Neurosurgery (UBNS)



KYLE WU, MD

MEDICAL SCHOOL
UMass Chan Medical School

FELLOWSHIP
Skull Base & Minimally Invasive Cranial Surgery Fellowship, The Ohio State University Wexner Medical Center & James Cancer Institute, Ohio

CURRENT EMPLOYMENT
Faculty, The Ohio State University, Wexner Medical Center

CLASS OF 2023



JOSEPH DRIVER, MD

MEDICAL SCHOOL
Loyola University Chicago

FELLOWSHIP
Complex Spine Fellowship, Cleveland Clinic

CURRENT EMPLOYMENT
Logan Health, Kalispell, MT



WALID IBN ESSAYED, MD

MEDICAL SCHOOL
Medical Faculty of Tunis, Tunisia

SUBSEQUENT EMPLOYMENT
UTHealth Neurosciences and McGovern Medical School Houston



DAVID SEGAR, MD

MEDICAL SCHOOL
Warren Alpert Medical School of Brown University

FELLOWSHIP
Functional and Epilepsy Fellowship, University of California, San Francisco

CURRENT EMPLOYMENT
Faculty, Albert Einstein College of Medicine

CLASS OF 2024



STANLEY BAZAREK, MD, PhD

MEDICAL SCHOOL
Rosalind Franklin University, Chicago Medical School

SUBSEQUENT EMPLOYMENT
Assistant Professor, Department of Neurological Surgery University Hospitals, Case Western Reserve University School of Medicine



NEIL KLINGER, MD

MEDICAL SCHOOL
Wayne State University School of Medicine

SUBSEQUENT EMPLOYMENT
Faculty, Munson Neurosurgery, Munson Medical Center, Traverse City, MI



MARTINA MUSTROPH, MD, PhD

MEDICAL SCHOOL
University of Illinois College of Medicine at Urbana

FELLOWSHIP
Stereotactic and Functional Neurosurgery Fellowship, Emory University



STIMULATED RAMAN SPECTROSCOPY IMAGE OF
BRAIN TUMOR SECTION
Image courtesy of Golby Lab

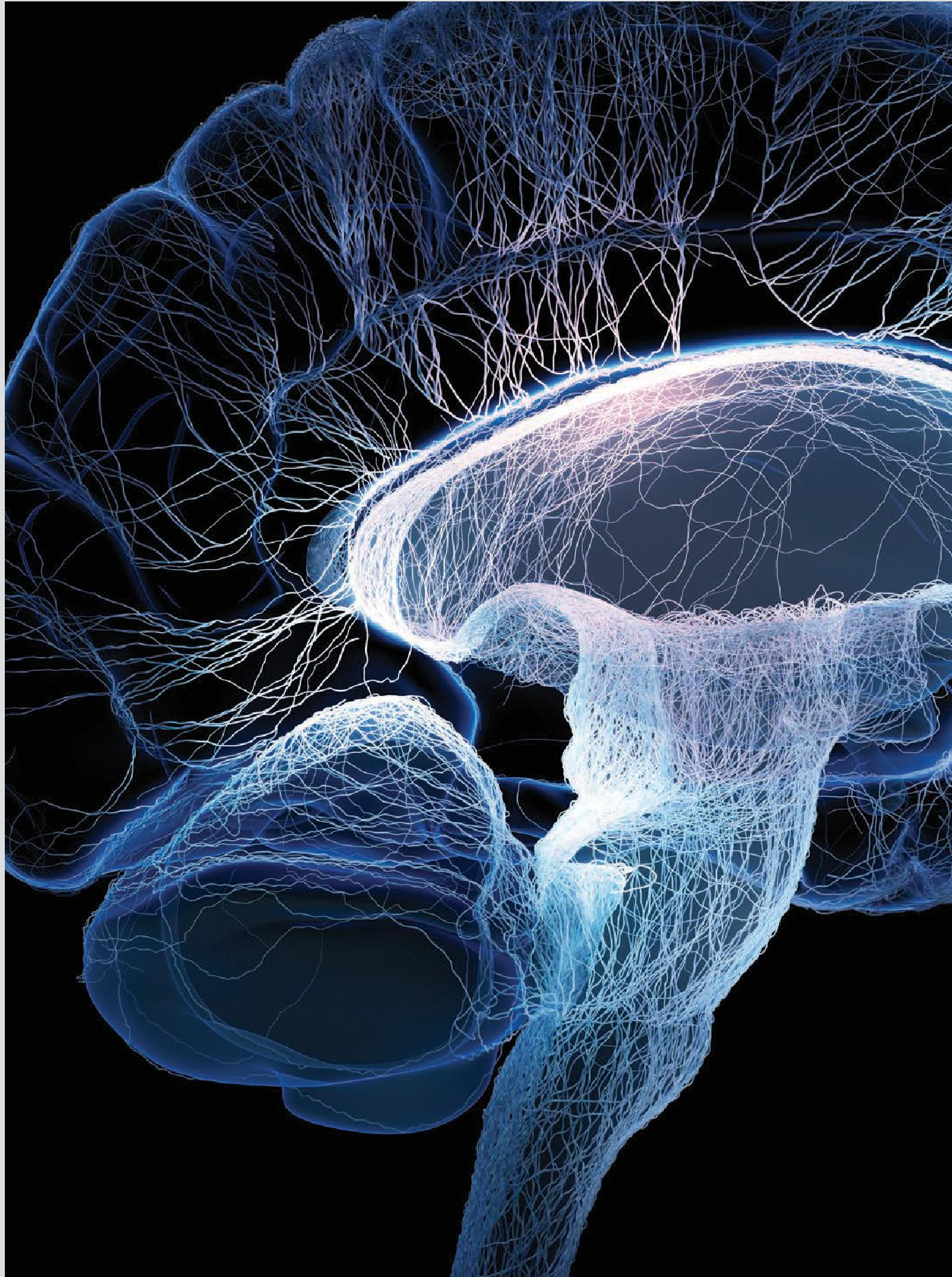
CURRENT RESIDENTS AND FELLOWS

RESIDENTS

Benjamin Johnston, MD, PhD	Chief Resident
Ari Kappel, MD	Chief Resident
Genaro Villa, MD, PhD	Chief Resident
Joshua Bernstock, MD, PhD	PGY-6
Melissa Chua, MD	PGY-6
Saksham Gupta, MD	PGY-6
Marcelle Altshuler, MD	PGY-5
Joshua Chalif, MD, PhD	PGY-5
Jason Chen, MD, PhD	PGY-5
Casey Jarvis, MD	PGY-4
Sean Lyne, MD	PGY-4
James Tanner McMahon, MD	PGY-4
Adam Glaser, MD	PGY-3
David Liu, MD	PGY-3
Gabrielle Luiselli, MD	PGY-3
Eric Chalif, MD	PGY-2
Ron Gadot, MD	PGY-2
Chibueze Nwagwu, MD	PGY-2
Sarah Blitz, MD	PGY-1
Alexander Yearley, MD	PGY-1
Eduardo Maury, MD, PhD	PGY-1

FELLOWS

David Bass, MD, PhD	CV-EV Fellow
Sahin Hanalioglu, MD, PhD	CV-EV Fellow
Frederic Racicot, MD	Image Guided Surgery Fellow
Ryan Chrenek, MD	Pituitary Fellow
Anil Can, MD	Skull Base Fellow



WEEKLY CONFERENCE SCHEDULE

MONDAY

7:00am - 7:30am	Cushing Service Didactics	BWH
7:30am - 8:15am	Neuro-Oncology/Tumor Board Conference	BWH/Dana-Farber

TUESDAY

7:00am - 7:30am	Dandy Service Didactics	BWH
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WEDNESDAY

6:30am - 7:00am	Morbidity/Mortality Conference	BWH (every Wed except 1st)
7:00am - 8:00am	Combined QI Conference	BWH (1st Wed of each month)
7:00am - 8:00am	Neurosurgery Grand Rounds	BWH (every Wed except 1st)
7:00am - 9:00am	Skull Base Cadaver Lab	BWH (Quarterly)
8:00am - 9:00am	Neuroradiology Conference	BWH
4:00pm - 5:00pm	Movement Disorder Conference	BWH (1st & 3rd Wed of each month)

THURSDAY

7:00am - 8:00am	Cerebrovascular/Endovascular Conference	BWH
7:00am - 8:00am	Skull Base Conference	BWH (every other Thurs)
9:30am - 10:30am	Pituitary Multidisciplinary Conference	BWH (monthly)
10:00am - 12:00pm	Resident Clinics (PGY 2 & 6s)	BCH
12:00pm - 1:00pm	Resident Core Curriculum Conference	BWH
1:00pm - 2:00pm	Epilepsy Conference	BWH
6:15pm - 7:15pm	Educational Conference	BWH

FRIDAY

7:30am - 8:30am	Neuropathology/Brain cutting	BWH
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GRAND ROUNDS SCHEDULE 2023-2024

7/12/23 Post-operative Pharmacology in the Neurosurgical Patient Michael J. Schontz, PharmD, BCPS, BCCCP	Strategies Martina Stippler, MD	2/14/24 Targeting CNS Neuroinflammation in Traumatic Brain Injury by Nasal Anti-CD3 Saef Izzy, MD, MBCHB	6/5/24 The Future of Neurosurgical Education is in YOUR HANDS! Matson Lecture H. Hunt Batjer, MD, FACS, FAANS
7/19/23 MRgFUS in Movement Disorder Surgery Dr. G. Rees Cosgrove	11/22/23 Brevican Targeting Peptide for Therapeutic Delivery to Malignant Brain Tumors Choi-Fong Cho, PhD	2/21/24 Application of Keyhole Approaches to Large and Complex Neurosurgical Pathology Professor Christos Profyris	6/26/24 Organization and Repair of Brain-spinal Connections Zhigang He, PhD, BM
7/26/23 Updates on Artificial Intelligence in Neurosurgery: Promises and Pitfalls Kevin Huang, MD	12/13/23 Resident Research Presentations: PGY-5 Residents: Joshua Bernstock, MD, PhD & Melissa Chua, MD PGY-4 Residents: Marcelle Altshuler, MD, Joshua Chalif, MD, PhD, & Jason Chen, MD, PhD	2/28/24 Disordered Learning as a Potential Roadmap for Studying Neuropsychiatric Disorders Emad Eskandar, MD MBA	7/10/24 From the Courtroom to the Operating Room – Interactive Insights into Neurosurgical Malpractice Omar Arnaout, MD
8/16/23 Harvey Cushing at the Brigham Dr. Edward Laws	12/20/23 Resident Research Presentations: PGY-5 Residents: Joshua Bernstock, MD, PhD, Melissa Chua, MD, & Saksham Gupta, MD PGY-4 Residents: Marcelle Altshuler, MD, Joshua Chalif, MD, PhD, & Jason Chen, MD, PhD	3/13/24 How Surgeons Learn Jacob R. Rachlin, MD, PhD	7/17/24 BWH Professionalism Experience and Resource Team Charles Morris, MD, MPH – Chief Medical Officer of Brigham and Women’s Hospital Julia Moretti – Director, Office of the CMO
8/23/23 Medical Innovation at Mass General Brigham Dr. William Gormley	1/10/24 1. Rescue of Traumatic Optic Neuropathy Following Repetitive Traumatic Brain Injury with Caveolin-1 and Related Functional Peptide 2. Discogenic Back Pain and Disc Degeneration: The Role of CSF1R Pathway in the Treatment and Prevention Yi Lu, MD, PhD	3/27/24 Embracing Change Mohammad Ali Aziz-Sultan, MD, MBA	7/24/24 Defining Possible Wenya Linda Bi, MD, PhD
9/13/23 Aerospace Medicine in Neurosurgery Marvin William Jackson, MD, MS, FABPM Acting Regional Flight Surgeon, Aerospace Medicine, New England	1/17/24 An Adventure in Neurosurgical Education, Research, and Practice Dr. Edward Laws	4/10/24 Moving Towards Conquering Pain Dr. Clifford J. Woolf	7/31/24 Cranial Reconstruction Timothy R. Smith, MD, PhD, MPH
9/27/23 Optimizing Mental Performance in Teams: The Role of Mental Skills to Enhance Self-Awareness and Communication Ari S. Miller, MA, CMPC	2/14/24 Targeting CNS Neuroinflammation in Traumatic Brain Injury by Nasal Anti-CD3 Saef Izzy, MD, MBCHB	4/17/24 Contemporary Management of Craniosynostosis Dr. Mark Proctor	8/14/24 Evolving as a Spine Surgeon in a Multidisciplinary System Ganesh M. Shankar, MD, PhD, FAANS
10/18/23 Neurosurgical Icons, Cushing’s Forefathers Dr. Edward Laws	2/14/24 Targeting CNS Neuroinflammation in Traumatic Brain Injury by Nasal Anti-CD3 Saef Izzy, MD, MBCHB	4/24/24 Discogenic Back Pain and Disc Degeneration: The Role of CSF1R Pathway in the Treatment and Prevention Yi Lu, MD, PhD	8/21/24 Preoperative versus Post-Operative Stereotactic Radiosurgery for Resected Brain Metastases: Review of a Novel Treatment Paradigm Anthony L. Asher, MD, FAANS, FACS
10/25/23 Current Concepts of Skull Base Surgery Dr. Nicholas Bambakidis	2/14/24 Targeting CNS Neuroinflammation in Traumatic Brain Injury by Nasal Anti-CD3 Saef Izzy, MD, MBCHB	5/8/24 Expanded Skull Base Approaches, Gene Therapy, Big Ten Research Consortium Kyle Wu, MD	8/28/24 Endovascular Transvenous Treatment of Communicating Hydrocephalus Using the Biomimetic eShunt Transdural Implant Adel M. Malek, MD, PhD, MBA, FAANS
11/15/23 Engage, Empower, Excel: Revolutionizing Your Teaching with Active Teaching		5/15/24 The Treatment of Posterior Fossa Ependymoma of Childhood- the State of the Art 2024 R. Michael Scott Day Mark D. Krieger, MD	

RESEARCH STUDIES

THE DEPARTMENT OF NEUROSURGERY AT BRIGHAM AND WOMEN'S HOSPITAL IS A PIONEER IN NEUROSCIENCE AND IS DEDICATED TO THE RESEARCH OF NEUROLOGICAL DISORDERS INCLUDING TUMOR BIOLOGY, ANEURYSMS, STROKE, EPILEPSY, AND SPINAL DISORDERS.

Below are our current research studies and clinical trials. Please note that not all of the studies are human subject trials.

BRAIN TUMOR RESEARCH

A Phase I Study of the Treatment of Recurrent Malignant Glioma with rQNestin34.5v.2, a Genetically Engineered HSV-1 Virus, and immunomodulation with Cyclophosphamide

PI: E. Antonio Chiocca, MD, PhD

Phase I Study of Neoadjuvant GMCI plus Immune Checkpoint Inhibitor Combined with Standard of Care for Newly Diagnosed High-Grade Gliomas

PI: Wenya Linda Bi, MD, PhD

A Randomized, Double-blinded, Placebo-controlled Phase 2, Study of (ERC1671/GM-CSF/Cydophosphamide)+Bevacizumab vs. (Placebo Injection/Placebo Pill) +Bevacizumab in the Treatment of Recurrent/Progressive, Bevacizumab naïve Glioblastoma and Gliosarcoma Patients (WHO grade IV malignant gliomas, GBM)

PI: E. Antonio Chiocca, MD, PhD

Protocol AT1001-102 Substudy: Evaluation of Ad-RTS-hIL-12 + Velelimex in Combination with Nivolumab in Subjects with Recurrent or Progressive Glioblastoma

PI: E. Antonio Chiocca, MD, PhD

A Multicenter Phase 2 Study of Oncolytic Polio/Rhinovirus Recombinant (PVSRIP0) in Recurrent WHO Grade IV Malignant Glioma Patients

PI: E. Antonio Chiocca, MD, PhD

A Phase 2, Open-label, Single-arm Study Evaluating the Efficacy, Safety, and Tolerability of Oncolytic Polio/Rhinovirus Recombinant (PVSRIP0) and the Immune Checkpoint Inhibitor Pembrolizumab in the Treatment of Patients with Recurrent Glioblastoma

PI: Patrick Wen, MD

Protocol AT1001-102 Expansion Substudy: Evaluation of Ad-RTS-hIL-12 + Velelimex in Subjects with Recurrent or Progressive Glioblastoma

PI: E. Antonio Chiocca, MD, PhD

Assessment of Safety and Feasibility of ExAblate Blood-Brain Barrier Disruption for the Treatment of High Grade Glioma in Patients Undergoing Standard Chemotherapy

PI: Alexandra Golby, MD

Assessment of Safety and Feasibility of Exablate Type 2 for Blood-Brain Barrier Disruption (BBBD) with Microbubble Resonators for the Treatment of Recurrent Glioblastoma (rGBM) in Subjects Undergoing Carboplatin Monotherapy

PI: Alexandra Golby, MD

Feasibility of the LUM Imaging System for Intraoperative Detection of Residual Cancer in the Tumor Bed in Subjects with Cancer Metastases to the Brain

PI: E. Antonio Chiocca, MD, PhD

A Pilot Study of an Implantable Microdevice for In Situ Evaluation of Drug Response in Patients with Primary Brain Tumors

PI: Pier Paolo Peruzzi, MD, PhD

Treatment response assessment maps (TRAMs) in the delineation of radiation necrosis from tumor progression after stereotactic radiation in patients with brain metastases: A prospective study

PI: Wenya Linda Bi, MD, PhD

SPINE RESEARCH

SJ Stabilization in Long Fusion to the Pelvis: Randomized Controlled Trial

PI: Yi Lu, MD, PhD

A prospective, Randomized, controlled, single-blind, dose-finding, multi-Center, parallel group study of the safety and efficacy of KUR-113 Bone Graft (TGplPTH1-34 in fibrin) versus local autograft for the treatment of patients undergoing single-level transforaminal lumbar interbody fusion (the STRUCTURE study)

PI: John Chi, MD, MPH

Study to Assess the Efficacy and Safety of VX-210 Subjects with Acute Traumatic Cervical Spinal Cord Injury

PI: Yi Lu, MD, PhD

The INSPIRE Study: Probably Benefit of the Neuro-Spinal Scaffold for Treatment of AIS. A Thoracic Acute Spinal Cord Injury

PI: Yi Lu, MD, PhD

A Clinical Study to Assess the Safety and Effectiveness of the Premia Spine TOPS System

PI: John Chi, MD, MPH

A Prospective, Concurrently Controlled, Multi-Center Study to Evaluate the Safety and Effectiveness of the Spinal Kinetics M6-C Artificial Cervical Disc Compared to Anterior Cervical Discectomy and Fusion (ACDF) for the Treatment of Contiguous Two-Level Symptomatic Cervical Radiculopathy

PI: John Chi, MD, MPH

The coflexCOMMUNITY Study: An Observational Study of coflex Interlaminar Technology

PI: Yi Lu, MD, PhD

FUNCTIONAL DISORDER CLINICAL TRIALS

A Randomized, Placebo Surgery Controlled, Double-blinded, Multi-center, Phase 2 Clinical Trial, Evaluating the Efficacy and Safety of VY-AADC02 in Advanced Parkinson's Disease with Motor Fluctuations

PI: G. Rees Cosgrove, MD

ExAblate Transcranial MRgFUS of the Globus Pallidum for Treatment of Parkinson's Disease

PI: G. Rees Cosgrove, MD

Global Registry: ExAblate 4000 Transcranial MR Guided Focused Ultrasound (TcMRgFUS) of Neurological Disorders

PI: G. Rees Cosgrove, MD

A Pivotal Clinical Trial of the Management of the Medically-Refractory Dyskinesia Symptoms or Motor Fluctuations of Advanced Idiopathic Parkinson's Disease with Unilateral Lesioning of the Globus Pallidum Using the ExAblate Neuro System

PI: G. Rees Cosgrove, MD

CEREBROVASCULAR CLINICAL TRIALS

ENRICH (Early Minimally-invasive Removal of ICH)

PI: M. Ali Aziz-Sultan, MD

SURF: A Prospective, Multicenter Study Assessing the Embolization of Intracranial Aneurysms using WAVE™ Extra Soft coils, a part of the Penumbra SMART COIL® System

PI: Nirav J. Patel, MD

Embolization of the Middle Meningeal Artery with ONYX™ Liquid Embolic System In the Treatment of Subacute and Chronic Subdural Hematoma (EMBOLISE)

PI: M. Ali Aziz-Sultan, MD

SOFia Aspiration System as first line Technique (SOFAST)

PI: M. Ali Aziz-Sultan, MD

HUMANITARIAN USE DEVICE STUDIES

MicroVention Low-profile Visualized Intraluminal Support (LVIS) Device

PI: M. Ali Aziz-Sultan, MD

Codman Neurovascular Enterprise Vascular Reconstruction Device and Delivery System

PI: Kai Frerichs, MD

Wingspan Stent System with Gateway PTA Balloon Catheter for the Treatment of Symptomatic Atherosclerotic Disease for Humanitarian Use

PI: Kai Frerichs, MD

Use of the Neuroform Atlas Stent, a Humanitarian Use Device, for the Treatment of wide-necked Cerebral Aneurysms

PI: Kai Frerichs, MD

PulseRider Aneurysm Neck Reconstruction Device

PI: M. Ali Aziz-Sultan, MD

ADDITIONAL CLINICAL RESEARCH STUDIES

Behavioral and MRI Studies in Healthy Subjects

PI: Alexandra Golby, MD

(continue)

RESEARCH STUDIES (CONTINUED)

Optical Coherence Tomography: Evaluation of the Retinal Thickness and Correlation with Clinical Outcomes after Transsphenoidal Surgery

PI: Edward Laws, MD

Endocrine and Surgical Complications in Pure Endoscopic Endonasal Transsphenoidal Surgery

PI: Edward Laws, MD

Outcomes for Neurosurgical Patients

PI: Elizabeth Claus, MD, PhD

Retrospective Review of Imaging Characteristics of Patients with Dural Arteriovenous Fistulas

PI: M. Ali Aziz-Sultan, MD

Biomarkers in Stroke and Intracerebral Hemorrhage

PI: Rose Du, MD, PhD

The GLIOGENE (Glioma Genetics) Study

PI: Elizabeth Claus, MD, PhD

Risk Factors and Outcomes for Glioma (GLIOGENE International Case/Control Study)

PI: Elizabeth Claus, MD, PhD

Three-Dimensional Angiography for Intraoperative Neuronavigation During Intracranial Tumor Resection: A Technical Note and Case Series

PI: M. Ali Aziz-Sultan, MD

Genetics of Intracranial Vessels

PI: Rose Du, MD, PhD

Gene Expression in Cerebral Aneurysms

PI: Rose Du, MD, PhD

Identification of Delirium Biomarkers Using Multimodal Sensor Data from the E4 Wristband Wearable Device

PI: William Gormley, MD, MPH, MBA

Radiographic Analysis of Image-Guidance Technology to Improve Accuracy and Reduce Iatrogenic Hemorrhage Associated with Ventriculostomy

PI: William Gormley, MD, MPH, MBA

Image and Function Guided Surgery of Brain Lesions

PI: Alexandra Golby, MD

Brain Basis of Memory Studied by fMRI and Intracranial EEG

PI: Alexandra Golby, MD

Digital Phenotyping of the Neurosurgical Patient: Towards More Effective Post-Operative Care – A Pilot Study

PI: Timothy R. Smith, MD, PhD, MPH

Outcomes in Patients Undergoing Spine Surgery

PI: Michael Groff, MD

Biomarkers of Traumatic Brain Injury

PI: William Gormley, MD, MPH, MBA

Intraoperative Stereotactic Molecular Imaging of Brain Tumor Margins

PI: Alexandra Golby, MD

Incidence of C2 Dysesthesia After C1 Lateral Mass Screws: Comparison Between Techniques of C2 Nerve Sectioning and C2 Nerve Preservation

PI: Michael Groff, MD

Retrospective Review of Patients Undergoing Arthroplasty vs ACDF

PI: John Chi, MD, MPH

GWAS Database for Aneurysms

PI: Rose Du, MD, PhD

Nanoscale Imaging of Neuromuscular Diseases

PI: E. Antonio Chiocca, MD, PhD

Retrospective Review of Transitional Care from Hospital to Discharge

PI: William Gormley, MD, MPH, MBA

Management of CNS Disorders Using Functional and Stereotactic Neurosurgical Interventions: Identifying Differentiating Features and Predictors of Improved Outcomes, in order to Improve Quality of Care

PI: G. Rees Cosgrove, MD

Retrospective Analysis of the Operative Management of Chronic Subdural Hematomas Following a Modified Technique for Introduction of a Subdural Catheter

PI: John Chi, MD, MPH

Diagnosis and Management of Rare CNS Lesions: Identifying Differentiating Features and Predictors of Improved Outcomes, in order to Improve Quality of Care

PI: Timothy R. Smith, MD, PhD, MPH

Genetic Epidemiology of Cerebral Aneurysms

PI: Rose Du, MD, PhD

Clinical Implications of Pipeline Embolization of Paraclinoidal Aneurysms

PI: M. Ali Aziz-Sultan, MD

The Impact of Medical School Research Funding on Career Choices

PI: Timothy R. Smith, MD, PhD, MPH

Long-term Outcomes for Neurosurgical Patients with Intracranial Neoplasms

PI: Elizabeth Claus, MD, PhD

Database of Skull Based Surgery Outcomes

PI: Linda Bi, MD, PhD

Degenerative Spine Disease – Characteristics, Treatments and Complications

PI: John Chi, MD, MPH

Neurovascular Disease Study

PI: Rose Du, MD, PhD

Spine Surgery Discharge Disposition

PI: William Gormley, MD, MPH, MBA

Evaluation and Treatment of Neurosurgical Disorders

PI: Alexandra Golby, MD

Craniectomy Associated Complications

PI: William Gormley, MD, MPH, MBA

Dural AVF Study

PI: Rose Du, MD, PhD

Analyzing Semantic Differences in the Documented Clinical Histories of Patients Undergoing Different Methods of Spinal Surgical Intervention

PI: Michael Groff, MD

Medical Complications in Patients with Intracranial Hemorrhage Managed in the NICU

PI: William Gormley, MD, MPH, MBA

Non-Invasive Collection of Physiologic Data Using a Novel Diffuse Optical Tomography Device for Measurement of Cerebral Oximetry in Intracranial Stroke: A Prospective, Non-Randomized, Single Center, Single Arm, Observational Physiologic Data Collection Trial

PI: William Gormley, MD, MPH, MBA

Indocyanine Green Angiography Guidance in Cranial Neurosurgery

PI: Linda Bi, MD, PhD

Patient-Reported Outcome Measure for Meningiomas

PI: Timothy R. Smith, MD, PhD, MPH

Use of Diffusion Tensor Imaging in Interventional MRI Implantation of Deep Brain Stimulation Electrodes

PI: G. Rees Cosgrove, MD

Efficacy of 68Ga-DOTATATE PET/CT in the Diagnosis of Ectopic ACTH Secreting Tumors After Failed Surgery for Cushing's Disease

PI: Edward Laws, MD

Biomarkers in Urine

PI: William Gormley, MD, MPH, MBA

Meningioma Segmentation Public Database

PI: Linda Bi, MD, PhD

5-ALA Intraoperative Fluorescence Imaging of Brain Tumors

PI: Alexandra Golby, MD

Machine learning of CT imaging for stroke patients

PI: Omar Arnaout, MD

Retrospective analysis of the outcomes of patients managed with Coflex Interlaminar Stabilization device

PI: Yi Lu, MD, PhD

Immune escape mechanisms in brain tumors

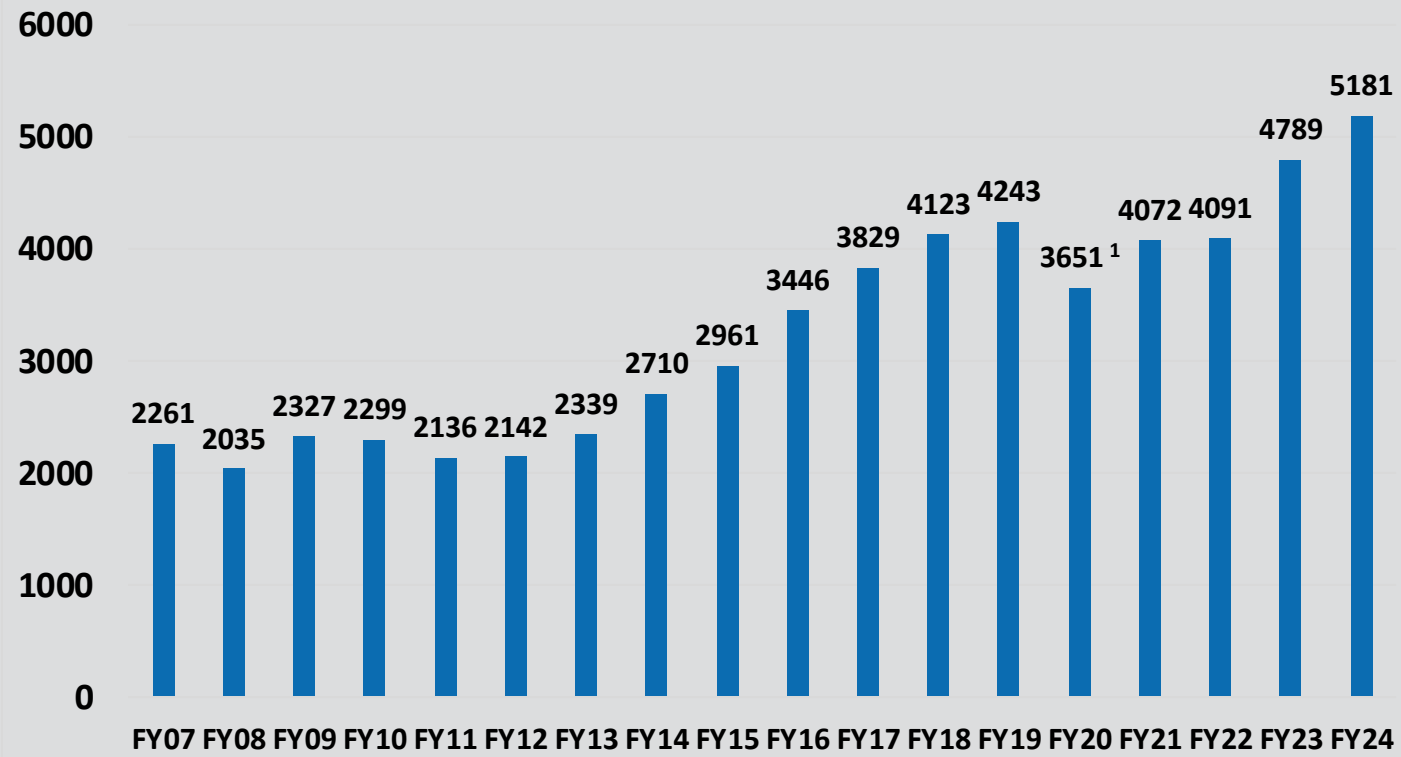
PI: Sean E. Lawler, PhD

Radiographic Changes in Spinal Biomechanics after Thoracolumbar Fusion

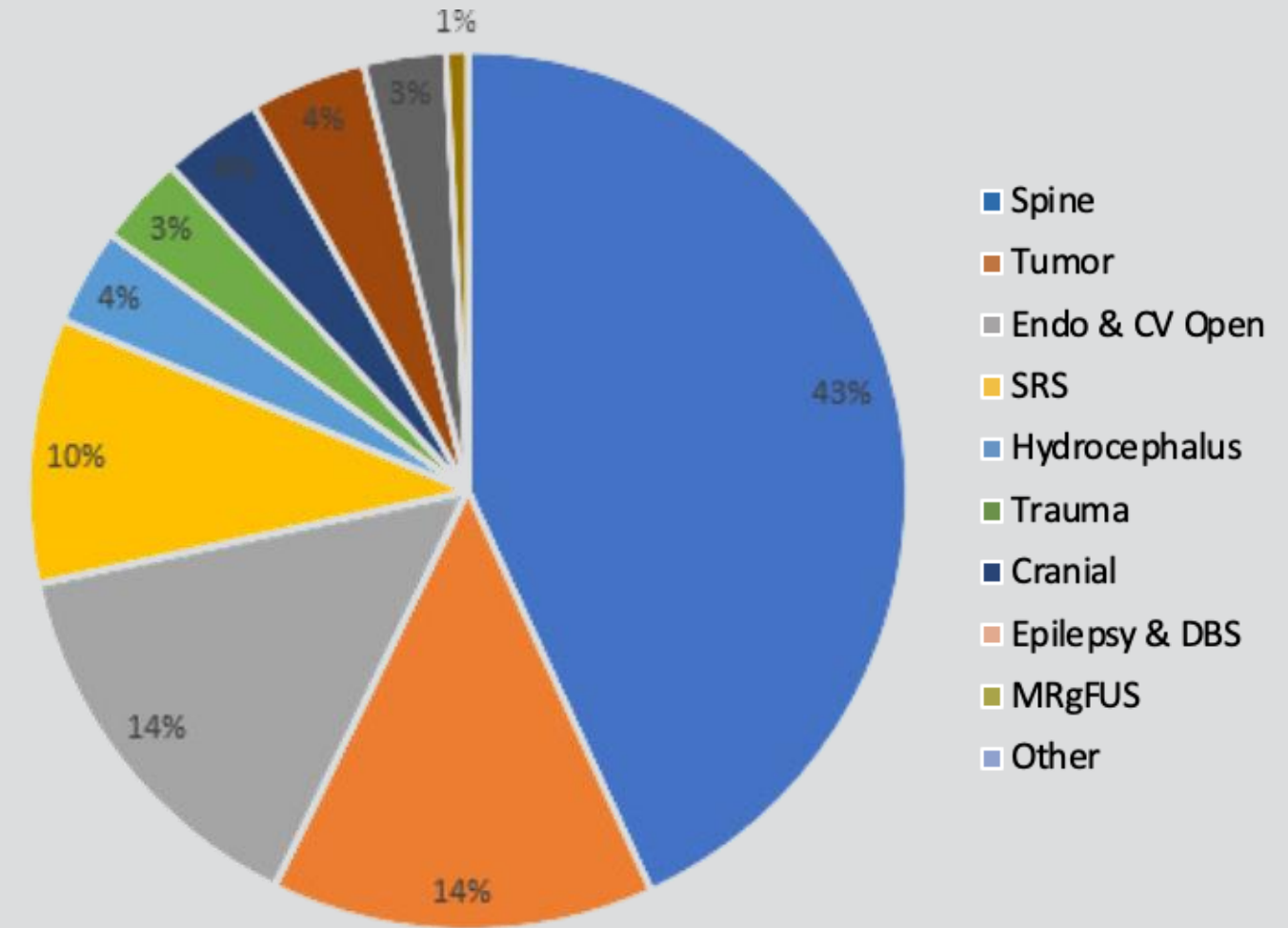
PI: Yi Lu, MD, PhD

NEUROSURGERY AT A GLANCE

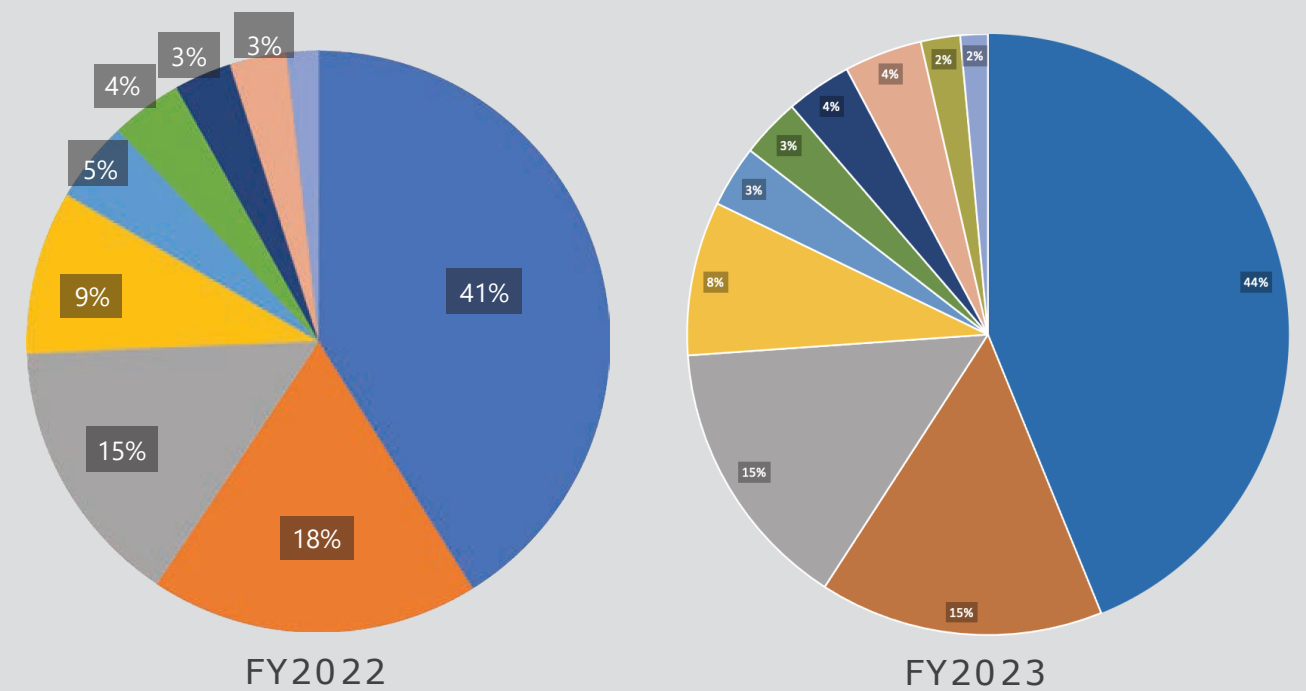
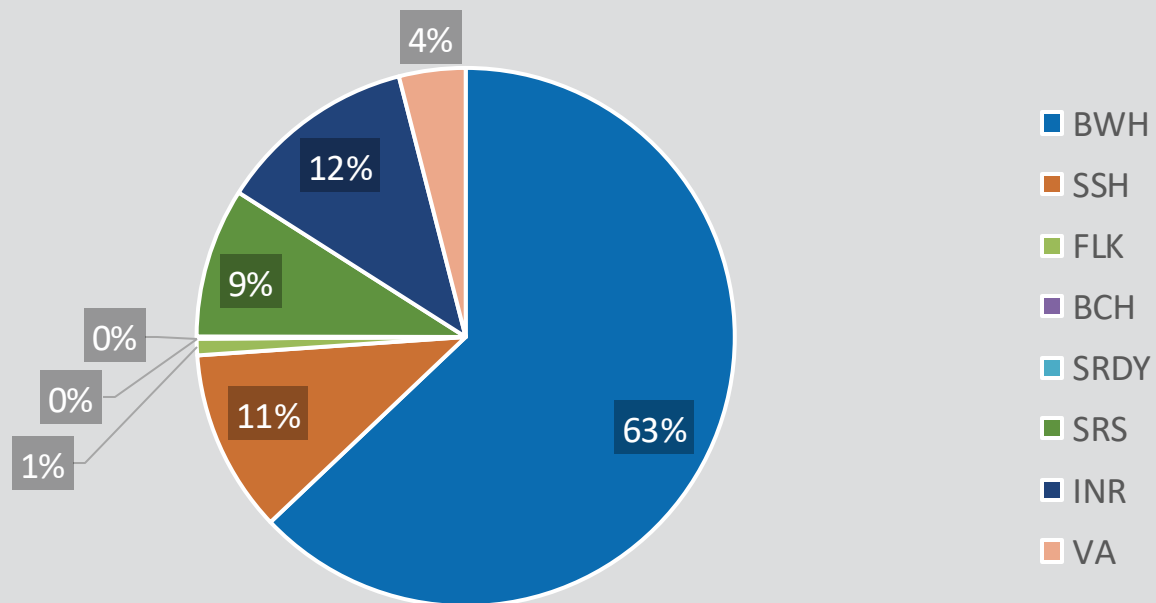
ANNUAL NEUROSURGICAL CASE VOLUME



FY24 CASE VOLUME BY SERVICE



FY24 CASE VOLUME BY LOCATION





OUR NEWLY CONSTRUCTED HALE BUILDING FOR TRANSFORMATIVE MEDICINE

HALE BUILDING FOR TRANSFORMATIVE MEDICINE AT BRIGHAM AND WOMEN'S HOSPITAL

OVERVIEW

Our new state-of-the-art Hale Building for Transformative Medicine (BTM), brings together the world's finest clinicians and scientists to accelerate breakthroughs and transform patient care in the neurosciences, orthopedics, rheumatology, immunology, and musculoskeletal health. Over one hundred years ago, the Peter Bent Brigham Hospital was erected behind Harvard Medical School so that its curious minds in science and medicine would never be too far from the laboratory bench. The BTM takes that idea and adapts it for 21st century medicine: bringing our clinicians and scientists together in one building to tackle the toughest dilemmas in healthcare.

This carefully constructed building located on the Brigham and Women's Hospital main campus is made of glass and steel, reaching 13 stories above ground and three below. The goal of the BTM is to promote collaboration and accelerate advancements in care for patients suffering from neurologic, orthopedic, and rheumatologic conditions such as Alzheimer's disease, Parkinson's disease, spinal disorders, brain tumors, multiple sclerosis and cerebrovascular disorders.

The BTM is home of the Neurosciences Center, which offers a multidisciplinary clinic where patients can receive a comprehensive evaluation and consensus opinion from several disciplines in one location. Traditionally, patients would have to visit separate clinics, which made

coordination of care difficult. With one Neurosciences Center, patients have a new experience with their treatment being led by highly skilled, collaborative teams. Patients are able to meet with top clinicians and specialists regarding the management and treatment of their condition.

In addition to these multidisciplinary centers, the facility also includes the following services and features:

- The Ann Romney Center for Neurologic Diseases
- Ambulatory Infusion Service
- Center for Alzheimer Research and Treatment (CART)
- Center for Brain Therapeutics
- Conference Center
- A cafe with a full-service menu for patients, visitors, and staff
- All Neurosurgical Laboratories (see page 36)
- Imaging services, including MRI, CT and X-Ray
- Innovation Hub
- Parking facility, including valet assistance
- Neuro-Procedural Suite for Diagnostics and Treatment, which includes EMG, EEG and TMS
- Neurosciences Center which includes, ophthalmology rooms, neuropsychiatry testing rooms, 28 exam rooms, 16 consult rooms and 2 procedure rooms.

BUILDING ON EXCELLENCE

CUTTING-EDGE TECHNOLOGIES AVAILABLE

NEUROSURGERY CLINICIANS AND RESEARCHERS HAVE ACCESS TO ADVANCED TOOLS AND OPPORTUNITIES TO COLLABORATE AND PUSH THE BOUNDARIES OF DISCOVERY IN WAYS THAT HAVE NEVER BEEN POSSIBLE BEFORE NOW.

MRI GUIDED FOCUSED-ULTRASOUND (MRGFUS)

Focused ultrasound treatments can be performed on an outpatient basis, require no incisions, and can result in minimal discomfort and few complications, allowing for rapid recovery. This technology is currently FDA approved for the treatment of essential tremor, and is currently being evaluated on its capability to treat parkinsonian tremor, blood brain barrier, and other neuro conditions via clinical trials here at Brigham and Women's Hospital.

7 TESLA (7.0T MRI)

This device aids our clinicians and researchers to visualize critical structures and pathologies that, until now, were not visible through MRI. Seeing these structures and pathologies will help clinicians differentiate between diseases and conditions in which symptoms may be similar and, in turn, choose the best treatment option for patients.

ROSA™ ROBOTIC SURGICAL ASSISTANT

ROSA™ acts as an assistant in the operating room and provides a service to help navigate and map the brain, similar to a GPS. It can be used in any type of cranial or spinal procedure that requires surgical planning with preoperative data and precise position and handling of instruments.

ADVANCED MULTIMODALITY IMAGE GUIDED OPERATING (AMIGO) SUITE

A state-of-the-art medical and surgical research environment that houses a complete array of advanced imaging equipment and interventional surgical systems.

O-ARM®

The O-arm® and StealthStation® systems eliminate the need to wear lead protective apparel during the navigated steps of the procedure. The O-arm offers multiple image protocols allowing you the flexibility to minimize dose to your patient based on your individual clinical objectives.

HYBRID OR (OPERATING ROOM)

This system allows our staff to perform high-end diagnostic imaging and multiple surgical or non-surgical interventions for an individual patient without ever leaving the operating room.

INTERVENTIONAL NEURORADIOLOGY SUITE

Endovascular procedures are performed in the angiographic suite rather than the operating room. Fluoroscopy (x-rays), ultrasound (US), computed tomography (CT), and magnetic resonance imaging (MRI) are used to guide their way through the body without making a skin incision.



7 TESLA



INTERVENTIONAL NEURORADIOLOGY SUITE



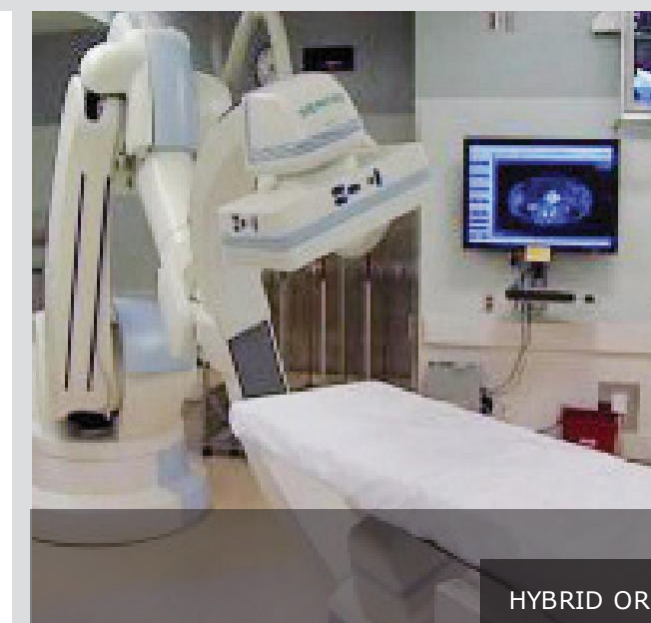
AMIGO SUITE



ROSA



O-ARM



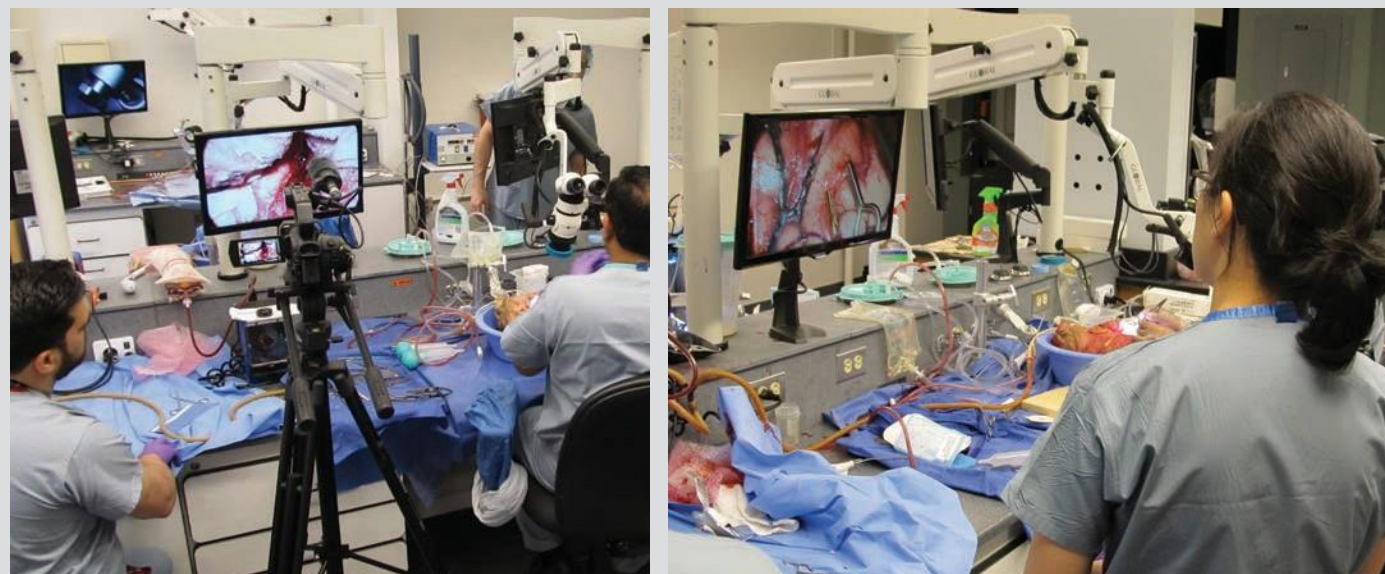
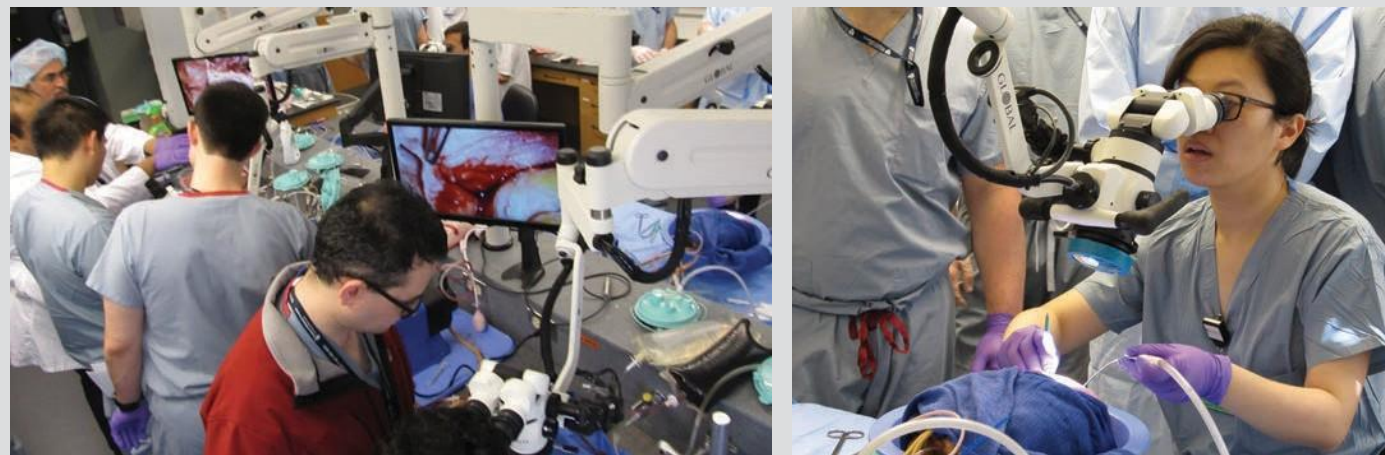
HYBRID OR

EDUCATION

THE DEPARTMENT OF NEUROSURGERY AIMS TO UNDERTAKE RELEVANT RESEARCH AND PROVIDE ACCESS TO RESOURCES AND PROFESSIONAL DEVELOPMENT OPPORTUNITIES FOR ALL ESTABLISHED PHYSICIANS AND SURGEONS, AS WELL AS THE EDUCATION AND TRAINING OF RESIDENTS AND FELLOWS — THE NEXT GENERATION OF MEDICAL PROFESSIONALS.

ANATOMICAL TRAINING LABORATORY

The Anatomical Training Laboratory (ATL) is a joint venture between neurosurgical departments at Boston Children's Hospital and Brigham and Women's Hospital to provide the Harvard medical community and other not for profit academic research institutions with training space, equipment and expert faculty resources to create the highest quality training environment for users to learn the latest neurosurgical techniques.



NEIL & ELISE WALLACE
BWH STRATUS 
CENTER FOR MEDICAL SIMULATION

STRATUS CENTER

The STRATUS Center for Medical Simulation is dedicated to advancing healthcare education, enhancing patient safety, and improving clinical outcomes. We leverage simulation's array of applications to support clinicians, researchers, industry, and other simulation centers. To learn more, visit www.brighamandwomens.org/STRATUS

OUR INTERDISCIPLINARY CENTER FOCUSES ON
EDUCATION
ASSESSMENT
RESEARCH
PROCESS IMPROVEMENT

To learn more, visit www.brighamandwomens.org/STRATUS



FACULTY RESEARCH & PUBLICATIONS 2020-24

OVERVIEW

Neurosurgery was founded by Dr. Harvey Cushing in 1913 at The Department of Neurosurgery at Brigham and Women's Hospital. Shortly after in 1929, Dr. Harvey Cushing's trainee, Dr. Franc D. Ingraham, created the pediatric neurosurgical service at Boston Children's Hospital. Today, these two institutions, along with Harvard Medical School, host a highly esteemed and fully integrated Neurosurgical Residency Program.

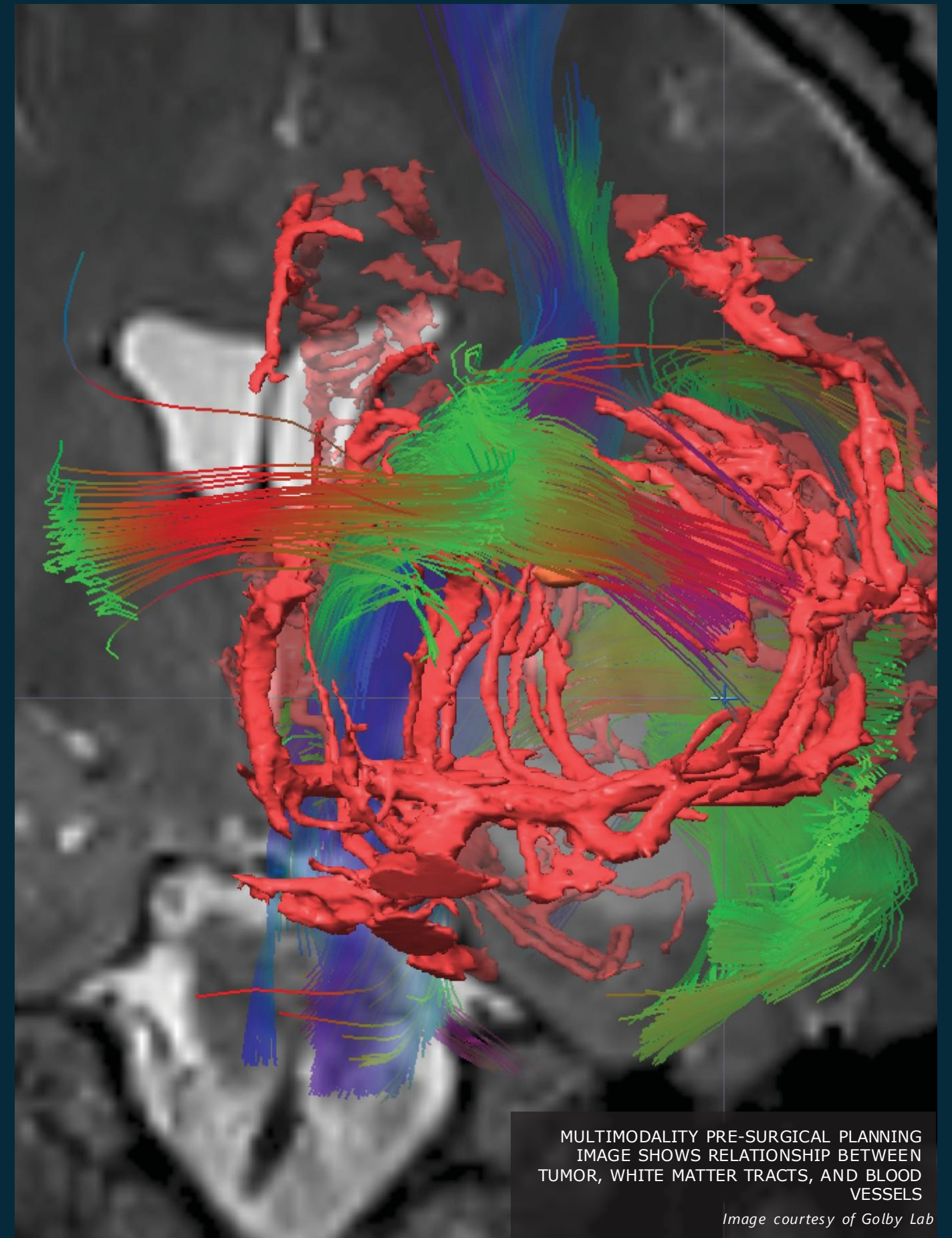
Today, the Departments of Neurosurgery at Boston Children's Hospital and Brigham and Women's Hospital are made up of 34 clinical faculty and over 100 department members devoted to the advancement of neurosurgical care, research, and education. Last year alone, the Department of Neurosurgery at Brigham and Women's Hospital offered 4,109 surgical treatments to patients from local, national, and international communities.

Our clinical faculty also conducts extensive scientific and clinical research to explore a range of complex neurological diseases, such as brain tumors, spinal disorders, stroke, and epilepsy. The aim of our research is to investigate the underlying risks, treatment strategies, and outcomes associated with these diseases and translate new findings to design and optimize neurosurgical treatments for each of our patients.

The Neurosurgery Residency Program of Brigham and Women's Hospital, Boston Children's Hospital and Harvard Medical School has a tradition of encouraging residents to participate in clinical and basic research studies with faculty, with exposure to emerging concepts and innovations.

OUR CLINICAL FACULTY SET AN IMPRESSIVE EXAMPLE FOR PRESENTING RESEARCH STUDIES, PUBLISHING PEER-REVIEWED ARTICLES, TEXTBOOKS, ABSTRACTS AND PRESENTATIONS.

The following booklet contains a listing of the Brigham and Women's Hospital affiliated neurosurgical research laboratories, as well as the research publications authored by the 34 neurosurgical clinical faculty at BWH and BCH over the past six years. As you will see, the range and depth of neurosurgical topics covered is impressive, and a testament to both the knowledge of our faculty and the dedication we have to the advancement of neurosurgical treatment and care.



MULTIMODALITY PRE-SURGICAL PLANNING IMAGE SHOWS RELATIONSHIP BETWEEN TUMOR, WHITE MATTER TRACTS, AND BLOOD VESSELS

Image courtesy of Golby Lab

BRIGHAM AND WOMEN'S HOSPITAL NEUROSURGICAL RESEARCH LABORATORIES

1

BEI LABORATORY

PRINCIPAL INVESTIGATOR: Fengfeng Bei, PhD

FOCUS: Established at the end of 2016, the Bei laboratory seeks to understand why damaged brain circuits cannot regenerate their connection and repair themselves. The lab studies this broad question in a range of model systems, using standard molecular and histological tools, electrophysiological assessment, behavioral analysis, as well as novel gene therapy approaches and transplantation strategies. Current projects include attempts to repair the optic nerve axons to restore vision, to regenerate the brain-spinal cord projecting axons for treating.

2

CENTER FOR STEM CELL THERAPEUTICS AND IMAGING (CSTI)

PRINCIPAL INVESTIGATOR: Khalid Shah, PhD

FOCUS: The overall goal of CSTI is to develop and test targeted cell-based therapies for cancer. The Center's theme is unique as it focuses on developing engineered cell-based therapies for cancer and integrates state of the art imaging techniques to assess the fate and therapeutic efficacy of such therapies in mouse tumor models that mimic clinical settings. Previously, the CSTI developed different mouse resection models of glioblastoma (GBM) utilizing image guided resection and followed recurrence non-invasively with optical and magnetic resonance (MR) imaging. As metastatic brain tumors are the most commonly observed intracranial tumors, the CSTI recently developed in vivo imageable mouse models of breast and melanoma to brain metastasis. These mouse models provide a unique and valuable platform to test novel therapeutic approaches for primary and metastatic tumor types. To develop novel biological therapies for cancer, the center engineered protein and oncolytic viral based cell surface receptor therapies that target cell death and proliferation pathways in tumor cells and tumor associated endothelial cells. Additionally, the CSTI pioneered two unique approaches that address the therapeutic delivery issues for the tumors

in the brain. Specifically, the center engineered stem cells that migrate to sites of primary tumors and micro-invasive tumor deposits and result in significant survival benefit in mice when placed in the biocompatible gels in the tumor resection cavity or injected via intracarotid artery in metastatic tumor bearing brains. Recently, the center has focused on targeting resistant tumors and developed stem cell deliverable bi-modal therapeutic molecules and immune-modulatory proteins and shown their efficacy in mouse models of brain tumors.

3

CEREBROVASCULAR LABORATORY

PRINCIPAL INVESTIGATOR: Rose Du, MD, PhD

FOCUS: The Cerebrovascular Laboratory studies the genetics of cerebrovascular diseases including intracranial aneurysms and stroke.

4

COMPUTATIONAL NEUROSCIENCE OUTCOMES CENTER (CNOC)

PRINCIPAL INVESTIGATORS: William B. Gormley, MD, MPH, MBA; Timothy R. Smith, MD, PhD, MPH; Omar Amaout, MD; Hasan A. Zaidi, MD

FOCUS: CNOC was developed by William Gormley, MD, MPH, MBA and Timothy R. Smith, MD, MPH, PhD in 2015. The center has grown out of the collaboration between leading healthcare organizations involved in the management and study of Neurosurgical disease. The center incorporates the clinical expertise of one of the leading Neurosurgical Centers in the world at Brigham and Women's Hospital in Boston Massachusetts, the resources and groundbreaking health care philosophy of Harvard Medical School. Along with the experience of two of the leading schools of Public Health in the United States; the Harvard T.H. Chan School of Public Health and the Yale School of Public Health. The academic and innovation skills of these institutions are brought together at the CNOC to expand knowledge and create and deliver improved patient centered outcomes in neurosurgery. The core values of the center include

research-based care, artificial intelligence (AI) analytics, patient-centered care, value-based care, clinical innovation, and global education.

5

HARVEY CUSHING NEURO-ONCOLOGY LABORATORIES (HCNL)

PRINCIPAL INVESTIGATOR: E. Antonio Chiocca, MD, PhD

FOCUS: Named after the father of modern Neurosurgery, Harvey Cushing, the goal of the laboratory is to perform research to improve the outcomes of patients suffering from brain tumors. Under the direction of E. Antonio Chiocca (Director) and Sean Lawler (Managing Director), the HCNL studies mouse tumor models, in vitro systems, and state of the art cell and molecular biology to meet this challenge. Major areas of interest include oncolytic viruses, extracellular vesicles, tumor immunology, anti-invasive drugs, the role of CMV in cancer, the blood brain barrier and non-coding RNAs. The HCNL is comprised of seven distinct research lab groups: Chiocca, Bronisz, Cho, Godlewski, Lawler, Nakashima, and Peruzzi. In this highly collaborative environment, the HCNL is able to conduct cutting edge research that is being pushed forward into clinical trials, which will improve the basic understanding and ability to treat these challenging and devastating tumors.

HCNL – CHIOCCA LABORATORY

PRINCIPAL INVESTIGATOR:

E. Antonio Chiocca, MD, PhD

FOCUS: The Chiocca lab focuses on developing therapies for brain tumors based on oncolytic viruses. The lab was involved in the first trials for locally delivered viral therapies for glioblastoma and has developed a number of novel, improved next generation viruses for tumor therapy and are engaged in numerous clinical trials in this area. The current focus is to determine how oncolytic viruses engage the immune system to promote sustained anti-tumor immunity, by acting as in situ vaccines.

HCNL – CHO LABORATORY

PRINCIPAL INVESTIGATOR: Choi-Fong Cho, PhD

FOCUS: The Cho lab focuses on: developing peptide(s) that can specifically bind high-grade gliomas, generating novel peptide-based anti-glioma therapeutics that can specifically target brain tumor cells and cross the blood-brain-barrier, developing the blood-brain-barrier organoid model, and bio-printing the blood-brain-barrier model on a chip.

HCNL – NAKASHIMA LABORATORY

PRINCIPAL INVESTIGATOR: Hiroshi Nakashima, PhD

FOCUS: The Nakashima lab focuses on the development of novel successful oncolytic virus (OVs) therapeutic approach for glioblastoma patients. The lab has committed to preclinical in vivo evaluation of promising OV in brain tumor models and reveal complex interplay of virus and immunosuppressive glioma microenvironments. Past work includes the study of virus and host relationships at the cellular level to improve the OV approach in glioma and generated preclinical and clinical strains of OVs. The team has been expanding this relationship at the host level, adaptive immunity, for the comprehensive therapeutic approach.

HCNL – PERUZZI LABORATORY

PRINCIPAL INVESTIGATOR: Pier Paolo Peruzzi, MD, PhD **FOCUS:** The Peruzzi Lab investigates the role of non-coding RNAs in the biology and therapy of brain cancers. More specifically, the major goal is to define novel biological features of microRNAs in order to develop a new generation gene therapy application, based on multifactorial genetic interference of cancer cells and disruption of their epigenetic regulation.

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NEUROAPOPTOSIS DRUG DISCOVERY LABORATORY

PRINCIPAL INVESTIGATOR: Xin Wang, PhD

FOCUS: The Neuroapoptosis Drug Discovery Laboratory is primarily interested in translational neuroscience that uses novel approaches to identify candidate therapeutics and potential targets for therapeutic intervention in neurological disorders. This includes cerebral ischemia, neonatal brain injury, Amyotrophic Lateral Sclerosis, Huntington's disease, and Parkinson's disease as well as alcohol-induced neurotoxicity and organ injuries. To date, most of the lab's research has involved the identification of neuroprotective compounds like melatonin, dipyrone, nortriptyline, N-acetyl-tryptophan, N-acetyl-serotonin, minocycline, methazolamide and herbs like buckwheat alcoholic extract and others which slow down the progression of neurological disorders and neurotoxicity. The laboratory also focuses on the fundamental mechanisms of neurological disorders and neurotoxicity. The lab's research also focuses on stem cell therapy.

NEURO-EPIDEMIOLOGY LABORATORY

PRINCIPAL INVESTIGATOR: Elizabeth Claus, MD, PhD

FOCUS: The Neuro-epidemiology Laboratory focuses on cancer and genetic epidemiology with an emphasis on the development of risk models for breast and brain tumors. Elizabeth Claud, MD, PhD is the overall PI of the Meningioma Consortium, the Meningioma Genome-Wide Association Study, and the Yale Acoustic Neuroma Study as well as a co-investigator of the GLOGENE (Genes for Glioma) and International Glioma Case/Control (GICC) projects in partnership with national patient brain tumor organizations including the American Brain Tumor Association (ABTA), the National Brain Tumor Society (NBTS) and the ANA. Dr. Claus works to develop cost- and time-efficient web- and smartphone- based recruitment strategies to be used in the study of brain tumors. She has developed such work in collaboration with the ANA and has funding from the ABTA/NBTS to develop a web-based registry for patients with low grade glioma to advance research efforts for this group of patients.

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SKULL BASE LABORATORY

PRINCIPAL INVESTIGATOR: Wenya Linda Bi, MD, PhD

FOCUS: The Skull Base Laboratory focuses on the translational biology of skull base tumors, including meningiomas, pituitary tumors, and vestibular schwannomas. The group applies genomic, immune, computational, and advanced microscopy imaging methodologies to define the biological landscape of skull base tumors, the mechanisms underlying their tumorigenesis, tumor evolution during recurrence, and treatment resistance for aggressive subtypes.

9

SPINAL CORD INJURY RESEARCH LABORATORY

PRINCIPAL INVESTIGATOR: Yi Lu, MD, PhD

FOCUS: The Spinal Cord Injury Research Laboratory focuses on research that has the potential to advance the clinical functional recovery in patients suffering from spinal cord injury and other traumatic neurological injuries. The main areas of interest include the mechanisms of axon regeneration with neurotrophic factors and integrins and the mechanisms of dormant pathway activation after incomplete injury leading to enhanced functional recovery.

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SURGICAL BRAIN MAPPING LABORATORY (SBML)

PRINCIPAL INVESTIGATOR: Alexandra Golby, MD

FOCUS: The Surgical Brain Mapping Laboratory leads the Department's research in surgical brain mapping, intraoperative imaging, and image guided neurosurgery through the use of intra-operative imaging to guide neurosurgical interventions, development and validation of tissue markets to guide surgery for brain tumors, develop diffusion imaging as a tool for pre-surgical mapping of white mater, translation of fMRI from neuroscience applications towards a tool for pre-surgical brain mapping in patients, and clinical trial of MR guided focused ultrasound for targeted blood brain barrier opening in patients with brain tumors. Building on a long history of preclinical and clinical use of MRgFUS at BWH, the lab is working with the industry leader to use non-invasive FUS as an adjunct to the clinical standard of care with the Stupp protocol.

SBML – TIE RESEARCH GROUP

PRINCIPAL INVESTIGATOR: Yanmei Tie, PhD

FOCUS: The Tie research group develops neuroimaging techniques, such as functional magnetic resonance imaging (fMRI) and diffusion MRI, to improve presurgical mapping of brain functions for neurosurgery planning and guidance. Additionally, the group combines brain functional and structural connectivity approaches to understand neural mechanism of disease pathophysiology, and to develop neuroimaging biomarkers for treatment-induced cognitive impairment in cancer patients. The goals are to inform therapeutic development and improve patients' overall well-being.

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SURGICAL MOLECULAR IMAGING LABORATORY

PRINCIPAL INVESTIGATOR: Nathalie Agar, PhD

FOCUS: The Surgical Molecular Imaging Laboratory develops and implements mass spectrometry and optical imaging approaches for surgical pathology and oncology. The lab also develops, validates, and applies imaging approaches for drug development research and molecular classification of disease, and works toward translating methodologies for the practice of individualized medicine. More specifically, part of the research takes place in the AMIGO suite, standard operating rooms, and a state-of-the-art laboratory equipped for tissue culture and optical and mass spectrometry imaging. Since receiving the NIH Director's New Innovator Award in 2010 for the work on "Real-Time Stereotactic Mass Spectrometry Tissue Analysis for Intraoperative Neurosurgical Guidance", the lab has implemented mass spectrometry protocols in the operating room for brain and breast cancer surgery. The work on the real-time analysis of an onco-metabolite (2-HG) to support surgical decision making now constitutes the basis for the very first IRB-approved study to use mass spectrometry derived diagnostic information to support surgical decision making. The effort to improve the management of brain tumors also includes extensive imaging of targeted therapies that transit through the blood-brain barrier in pre-clinical animal models and clinical trial patients with correlation to non-invasive radiologic imaging and detailed pharmacodynamics. Using MALDI FTICR mass spectrometry imaging we can specifically image most drugs and spatially resolve their distribution as it relates to the vasculature by

simultaneously imaging heme as a natural biomarker of the vasculature. Using the same approach on stereotactic MRI-registered surgical samples from clinical trials for primary brain tumors and brain metastases, we further assess drug distribution in the 3D anatomy of the tumor and brain to account for the effect of brain anatomy and tumor heterogeneity on the permeability of blood-brain and blood-tumor barriers.



OSSAMA AL-MEFTY, MD

DIRECTOR, SKULL BASE PROGRAM,
BRIGHAM AND WOMEN'S HOSPITAL

ACADEMIC TITLE

Lecturer, Harvard Medical School

MEDICAL SCHOOL

Damascus University School of Medicine, 1972

RESIDENCY

Medical College of Ohio at
Toledo, General Surgery, 1974

West Virginia
University,
Neurosurgery, 1978

CERTIFICATIONS

Neurosurgery, 1980

CLINICAL INTERESTS

Acoustic neuroma, aneurysms, arteriovenous malformations, brain tumors, bypass, cavernomas, cavernous malformations, cerebral revascularization, craniopharyngioma, gliomas, glomus tumor, jugular foramen tumors, meningiomas, percutaneous radiofrequency, pineal region tumor, pituitary tumors, radiosurgery, skull base neurosurgery, skull base tumors, spinal cord tumors, trigeminal neuralgia

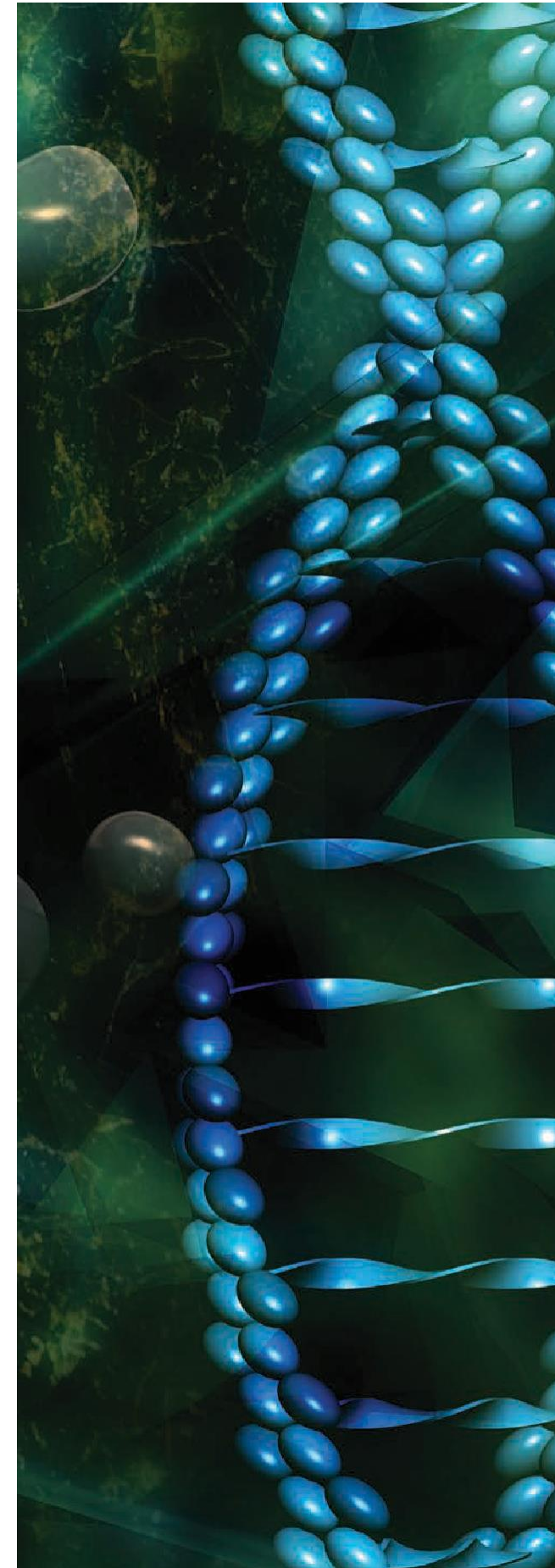
PUBLICATIONS

1. Zhang F, Xie G, Leung L, Mooney MA, Epprecht L, Norton I, Rathi Y, Kikinis R, Al-Mefty O, Makris N, Golby AJ, O'Donnell LJ. Creation of a novel trigeminal tractography atlas for automated trigeminal nerve identification. *Neuroimage*. 2020 Oct 15;220:117063. doi: 10.1016/j.neuroimage.2020.117063. Epub 2020 Jun 20. PMID: 32574805; PMCID: PMC7572753.
2. Aum D, Rassi MS, Al-Mefty O. Petroclival meningiomas and the petrosal approach. *Handb Clin Neurol*. 2020;170:133-141. doi: 10.1016/B978-0-12-822198-3.00035-5. PMID: 32586485.
3. Baldoncini M, Saenz A, Villalonga JF, Campero A, Fernandez J, Sánchez-Gonzalez F, Kadri P, Vasudevan K, Al-Mefty O. Safe Zones for Temporal Muscle Hook Retraction: A Technical Note. *World Neurosurg*. 2020 Oct;142:63-67. doi: 10.1016/j.wneu.2020.06.187. Epub 2020 Jun 27. PMID: 32603863.
4. Mooney MA, Abolfotoh M, Bi WL, Tavanaiepour D, Almefty RO, Bassiouni H, Pravdenkova S, Dunn IF, Al-Mefty O. Is Falcine Meningioma a Diffuse Disease of the Falx? Case Series and Analysis of a "Grade Zero" Resection. *Neurosurgery*. 2020 Oct 15;87(5):900-909. doi: 10.1093/neuros/nyaa038. PMID: 32294205.
5. Abou-Al-Shaar H, Cohen MA, Bi WL, Gozal YM, Alzhrani G, Karsy M, Al-Mefty O, Couldwell WT. Surgical Management of Multifocal Trigeminal Schwannomas. *Oper Neurosurg (Hagerstown)*. 2020 Nov 16;19(6):659-666. doi: 10.1093/ons/opaa227. PMID: 32717071.
6. Kadri PAS, Ibn Essayed W, Al-Mefty O. The Resection of a Thalamic Pilocytic Astrocytoma Through the Transchoroidal Fissure, Transcallosal Approach: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Apr 15;20(5):E346-E347. doi: 10.1093/ons/opab015. PMID: 33855454.
7. Almefty KK, Al-Mefty O. Petrosal Approach With Preservation of the Superior Petrosal Sinus (the Graceful Petrosal) for Resection of Giant Trigeminal Schwannoma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Apr 15;20(5):E342-E343. doi: 10.1093/ons/opaa427. PMID: 33855455.
8. Ibn Essayed W, Almefty KK, Al-Mefty O. Recurrent Chordoma Resection in the Advanced Multimodality Image Guided Operating Suite: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Apr 15;20(5):E344-E345. doi: 10.1093/ons/opaa445. PMID: 33855456.
9. Essayed WIBN, Mooney MA, Al-Mefty O. Venous Anatomy Influence on the Approach Selection of a Petroclival Clear Cell Meningioma With Associated Multiple Spinal Meningiomas: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 May 13;20(6):E426-E427. doi: 10.1093/ons/opab072. PMID: 33928378.
10. Pojskić M, Arnautović KI, Ibn Essayed W, Al-Mefty O. A Combined Microsurgical and Endovascular Approach to Giant Paraclinoid Aneurysm: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 May 13;20(6):E424-E425. doi: 10.1093/ons/opab059. PMID: 33928385.
11. Erkmen K, Aboud E, Al-Mefty O. Petrosal Approach for Giant Retrochiasmatic Craniopharyngioma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 May 13;20(6):E420-E421. doi: 10.1093/ons/opab045. PMID: 33940607.
12. Rassi MS, Al-Mefty O. Surgical Treatment of Bilateral Optic Nerve Sheath Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 May 13;20(6):E418-E419. doi: 10.1093/ons/opab052. PMID: 33940610.
13. Essayed W, Mooney MA, Al-Mefty O. Transcavernous Resection of an Upper Clival Chondrosarcoma: "Cavernous Sinus as a Route": 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 May 13;20(6):E422-E423. doi: 10.1093/ons/opab043. PMID: 33940624.
14. Bi WL, Nayak L, Meredith DM, Driver J, Du Z, Hoffman S, Li Y, Lee EQ, Beroukhim R, Rinne M, McFaline-Figueroa R, Chukwueke U, McCluskey C, Gaffey S, Cherniack AD, Stefanik J, Doherty L, Taubert C, Cifrino M, LaFrankie D, Graillon T, Wen PY, Ligon KL, Al-Mefty O, Huang RY, Muzikansky A, Chiocca EA, Santagata S, Dunn IF, Reardon DA. Activity of PD-1 blockade with Nivolumab among patients with recurrent atypical/anaplastic meningioma: Phase II trial results. *Neuro Oncol*. 2021 May 20;noab118.
15. Aversa A, Essayed WIBN, Al-Mefty O. Total Petrosectomy for the Total Resection of Sphenopetroclival Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jun 15;21(1):E22-E23. doi: 10.1093/ons/opab089. PMID: 33928386.
16. Aboud E, Essayed W, Al-Mefty O. Two-Stage Double Petrosal Approach for the Total Resection of Petroclival-Cavernous Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jun 15;21(1):E30-E31. doi: 10.1093/ons/opab049. PMID: 33649755.
17. Wu K, Bi WL, Essayed W, Patel V, Kadri P, Al-Mefty O. Integration of Microanatomy, Neuronavigation, Dynamic Neurophysiologic Monitoring, and Intraoperative Multimodality Imaging for the Safe Removal of an Insular Glioma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jun 15;21(1):E28-E29. doi: 10.1093/ons/opab050. PMID: 33940623.
18. Essayed WIBN, Aboud E, Al-Mefty O. Pineal Region Hemangioblastoma Resection Through Paramedian Supracerebellar Approach: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jun 15;21(1):E34-E35. doi: 10.1093/ons/opab104. PMID: 34009380.
19. Kadri PAS, Essayed WIBN, Al-Mefty O. Resection of Pontine Cavernoma Through the Anterior Transpetrosal Approach: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jun 15;21(1):E26-E27. doi: 10.1093/ons/opab103. PMID: 34009381.
20. Essayed WIBN, Al-Mefty O. Endoscopic-Assisted Keyhole Resection of a Recurrent Epidermoid Tumor: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jun 15;21(1):E32-E33. doi: 10.1093/ons/opab098. PMID: 34009386.
21. Dimensional Operative Video, Operative Neurosurgery, Volume 20, Issue 6, June 2021, Pages E426-E427

22. Tavanaiepour D, Abolfotoh M, Essayed W, Al-Mefty O. Radical Resection of a Giant Epidermoid Tumor Associated With Miniature Chordoma Utilizing a Combined Endoscopic-Microscopic Technique: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Jul 15;21(2):E95-E96. doi: 10.1093/ons/opab130. PMID: 33930154.
23. Antonio Aversa, MD, Walid I B N Essayed, MD, Ossama Al-Mefty, MD, Total Petrosectomy for the Total Resection of Sphenopetroclival Meningioma: 2-Dimensional Operative Video, *Operative Neurosurgery*, Volume 21, Issue 1, July 2021, Pages E22–E23
24. Rami O Almefty, MD, Walid Ibn Essayed, MD, Ossama Al-Mefty, MD, Medial Acoustic Tumors: Special Considerations: 2-Dimensional Operative Video, *Operative Neurosurgery*, 2021
22. Almefty RO, Essayed W, Al-Mefty O. Medial Acoustic Tumors: Special Considerations: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Jul 15;21(2):E101-E102. doi: 10.1093/ons/opab129. PMID: 33930156.
23. Mooney MA, Ibn Essayed W, Aziz-Sultan MA, Al-Mefty O. Concomitant Embolization and Microsurgical Resection of a Giant, Hypervascular Skull Base Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Jul 15;21(2):E97-E98. doi: 10.1093/ons/opab128. PMID: 33930164.
24. Aversa A, Al-Mefty O. Zygomatic Approach to Cavernous Sinus Chordoma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Jul 15;21(2):E105-E106. doi: 10.1093/ons/opab126. PMID: 33930168.
25. Mooney MA, Ibn Essayed W, Al-Mefty O. Simpson Grade I Removal of Tuberculum Sella Meningioma Through the Supraorbital Approach: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Jul 15;21(2):E103-E104. doi: 10.1093/ons/opab133. PMID: 33989424.
26. Joseph Driver, M.D, Samantha E Hoffman, B.S, Sherwin Tavakol, M.P.H, Eleanor Woodward, B.S, Eduardo A Maury, B.S, Varun Bhawe, B.A, Noah F Greenwald, B.S, Farshad Nassiri, M.D, Kenneth Aldape, M.D, Gelareh Zadeh, M.D, Abrar Choudhury, A.B, Harish N Vasudevan, M.D., Ph.D, Stephen T Magill, M.D., Ph.D, David R Raleigh, M.D., Ph.D, Malak Abedalthagafi, M.D, Ayal A Aizer, M.D, Brian M Alexander, M.D, Keith L Ligon, M.D., Ph.D, David A Reardon, M.D, Patrick Y Wen, M.D, Ossama Al-Mefty, M.D, Azra H Ligon, Ph.D, Adrian M Dubuc, Ph.D, Rameen Beroukhim, M.D., Ph.D, Elizabeth B Claus, M.D, Ian F Dunn, M.D, Sandro Santagata, M.D., Ph.D, Wenya Linda Bi, M.D., Ph.D, A Molecularly Integrated Grade for Meningioma, *Neuro-Oncology*, 2021, noab213, <https://doi.org/10.1093/neuonc/noab213>.
27. Erkmén K, Al-Mefty O. Transcondylar Approach for Resection of Medullary Cavernous Malformation: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Aug 16;21(3):E233-E234. doi: 10.1093/ons/opab220. PMID: 34192765.
28. Eisenberg M, Ibn Essayed W, Al-Mefty O. Extirpation of Recurrent Petrous Apex Cholesterol Granuloma Through the Zygomatic Approach: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Aug 16;21(3):E229-E230. doi: 10.1093/ons/opab156. PMID: 34114037.
29. Aversa A, Al-Mefty O. Aggressive Radiation-Induced Cavernous Sinus Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Aug 16;21(3):E231-E232. doi: 10.1093/ons/opab195. PMID: 34133742.
30. Aboud E, Tamer WA, Ibn Essayed W, Al-Mefty O. Resection of Giant Invasive Parasagittal Atypical Meningioma With a Venous Graft Reconstruction of the Sagittal Sinus: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Sep 15;21(4):E332-E333. doi: 10.1093/ons/opab232. PMID: 34171911.
31. Almefty RO, Ibn Essayed W, Al-Mefty O. "Save the Nerve": Technical Nuances for Hearing Preservation and Restoration in Vestibular Schwannoma Surgery: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Sep 15;21(4):E328-E329. doi: 10.1093/ons/opab230. PMID: 34171915.
32. Bulsara KR, Ibn Essayed W, Aboud E, Al-Mefty O. Diaphragm Sellae Meningioma: Distinct Clinical, Anatomic, and Surgical Considerations: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Sep 15;21(4):E336-E337. doi: 10.1093/ons/opab234. PMID: 34171924.
33. Almefty RO, Al-Mefty O. Cervical to Petrous Carotid Artery High-Flow Bypass for Carotid Artery Pseudoaneurysm Through Zygomatic Approach: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Sep 15;21(4):E334-E335. doi: 10.1093/ons/opab235. PMID: 34192762.
34. Michael A Mooney, MD, Walid Ibn Essayed, MD, Ossama Al-Mefty, MD, Nuances of Olfactory Groove Meningioma Surgery: 2-Dimensional Operative Video, *Operative Neurosurgery*, Volume 21, Issue 4, October 2021, Pages E338–E339, <https://doi.org/10.1093/ons/opab233>
35. Walid Ibn Essayed, MD, Emad Aboud, MD, Ossama Al-Mefty, MD, Interposition Grafting of the Facial Nerve After Resection of a Large Facial Nerve Schwannoma: 2-Dimensional Operative Video, *Operative Neurosurgery*, Volume 21, Issue 4, October 2021, Pages E340–E341, <https://doi.org/10.1093/ons/opab240>
36. Ibn Essayed W, Al-Mefty O. Transcondylar Odontoid Resection and Stabilization for Craniovertebral Degenerative Compression: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Oct 13;21(5):E429-E430. doi: 10.1093/ons/opab269. PMID: 34293159.
37. Ibn Essayed W, Al-Mefty O. Metachronous Skull Base Paraganglioma Surgical Management: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Oct 13;21(5):E427-E428. doi: 10.1093/ons/opab268. PMID: 34293168.
38. Aversa A, Al-Mefty O. Simpson Grade I Resection of Type II Clinoidal Meningioma Through Cranio-orbital Zygomatic Approach: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Oct 13;21(5):E433-E434. doi: 10.1093/ons/opab270. PMID: 34293178.
39. Ibn Essayed W, Al-Mefty O. Resection of a Medulla Oblongata Hemangioblastoma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Oct 13;21(5):E435. doi: 10.1093/ons/opab278. PMID: 34333644.
40. Essayed W, Aboud E, Al-Mefty O. Foramen Magnum Meningioma-The Attainment of the Intra-Arachnoidal Dissection: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Nov 15;21(6):E518-E519. doi: 10.1093/ons/opab317. PMID: 34498699.
41. Ibn Essayed W, Tavanaiepour D, Abolfotoh M, Al-Mefty O. Microsurgical Resection of a Parasellar Meningioma Invading the Cavernous Sinus, Bone, and Optic Canal: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Nov 15;21(6):E520-E521. doi: 10.1093/ons/opab337. PMID: 34510204.
42. Almefty RO, Ibn Essayed W, Al-Mefty O. Clipping of Multiple Cerebral Aneurysms Through Cranioorbital Zygomatic Approach: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Nov 15;21(6):E522-E523. doi: 10.1093/ons/opab320. PMID: 34510210.
50. Ibn Essayed W, Al-Mefty O. Giant Ossified Clival Chondrosarcoma Resection: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Nov 15;21(6):E526-E527. doi: 10.1093/ons/opab336. PMID: 34510216.
51. Ibn Essayed W, Aboud E, Al-Mefty O. Combined Microscopic-Endoscopic Transmastoid Resection of a Petrous Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Nov 15;21(6):E528-E529. doi: 10.1093/ons/opab340. PMID: 34510218.
52. Almefty KK, Bi WL, Ibn Essayed W, Al-Mefty O. Resection of a Dumbbell-Shaped Facial Nerve Schwannoma With Preservation of Facial Nerve Function Through the Extended Middle Fossa Approach: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Nov 15;21(6):E530-E531. doi: 10.1093/ons/opab335. PMID: 34561700.
53. Kadri PAS, Arnautović KI, Ibn Essayed W, Al-Mefty O. Resection of Clival Chordoma Through the Anterior Clivectomy: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Nov 15;21(6):E516-E517. doi: 10.1093/ons/opab334. PMID: 34561705.
54. Wu KC, Aboud E, Al-Mefty O. Suprabulbar Approach to Jugular Fossa Tumors: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2021 Nov 15;21(6):E524-E525. doi: 10.1093/ons/opab339. PMID: 34670274.

55. Ibn Essayed W, Rassi M, Chi JH, Al-Mefty O. Multicentric Chordoma With Initial Resection by Bilateral Transcondylar Approach: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jan 1;22(1):e37-e38. doi: 10.1227/ONS.0000000000000001. PMID: 34982910.
56. Mooney MA, Al-Mefty O. Syringomyelia From Extramedullary Compression: Resolution After Microsurgical Resection of a High-Cervical Spine Schwannoma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jan 1;22(1):e39. doi: 10.1227/ONS.0000000000000003. PMID: 34982911.
57. Ibn Essayed W, Al-Mefty O. Falcotentorial Meningioma Resection Through the Supracerebellar Infratentorial Approach: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jan 1;22(1):e42. doi: 10.1227/ONS.0000000000000004. PMID: 34982913.
58. Kadri PAS, Ibn Essayed W, Al-Mefty O. Preservation of Cranial Nerves Function in Glomus Jugulare Surgery: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jan 1;22(1):e43. doi: 10.1227/ONS.0000000000000021. PMID: 34982914.
59. Aversa A, Al-Mefty O. The Utilization of the Cranio-Orbital Zygomatic Approach for the Resection of Juvenile Nasopharyngeal Angiofibroma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jan 1;22(1):e44-e45. doi: 10.1227/ONS.0000000000000008. PMID: 34982915.
60. Mooney MA, Al-Mefty O. Sugita-Kobayashi Maneuver for Preservation of Large Bridging Veins in the Interhemispheric Approach: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jan 1;22(1):e46. doi: 10.1227/ONS.0000000000000022. PMID: 34982916.
61. Emerson SN, Rassi MS, Al-Mefty O. Grade Zero Removal of a Pterional Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Feb 1;22(2):e80. doi: 10.1227/ONS.0000000000000041. PMID: 35007214.
62. Ibn Essayed W, Al-Mefty O. Resection of Peritorcular Meningioma With Sinus Intimal Layer Preservation: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Feb 1;22(2):e82. doi: 10.1227/ONS.0000000000000002. PMID: 35007220.
63. Essayed W, Haddad GF, Al-Mefty O. Anterior Petrosal: A Key Approach to Upper Petroclival Meningiomas: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Feb 1;22(2):e81. doi: 10.1227/ONS.0000000000000046. PMID: 35007238.
64. Essayed W, Juvekar P, Bernstock JD, Rassi MS, Almefty K, Zamani AA, Golby AJ, Al-Mefty O. Multimodal Intraoperative Image-Driven Surgery for Skull Base Chordomas and Chondrosarcomas. *Cancers* (Basel). 2022 Feb 15;14(4):966. doi: 10.3390/cancers14040966. PMID: 35205724; PMCID: PMC8870528.
65. Essayed W, Aboud E, Al-Mefty O. Hyperostotic Invasive Meningioma of the Sphenoid Ridge Surgical Considerations: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Mar 1;22(3):e124-e125. doi: 10.1227/ONS.0000000000000074. PMID: 35030105.
66. Essayed W, Aboud E, Adada B, Al-Mefty O. Clival Meningioma: Remove the Bone to Pursue Ventral Exposure: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Mar 1;22(3):e129. doi: 10.1227/ONS.0000000000000108. PMID: 35030142.
67. Essayed W, Al-Mefty O. Orbital Cavernous Venous Malformation Resection Through Supraorbital Craniotomy: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Mar 1;22(3):e128. doi: 10.1227/ONS.0000000000000100. PMID: 35042225.
68. Strang RD, Essayed W, Aboud E, Al-Mefty O. Resection of a Giant Atypical Pediatric Meningioma Encasing the Cerebral Arterial Tree: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Mar 1;22(3):e126-e127. doi: 10.1227/ONS.0000000000000107. PMID: 35081083.
69. Almefty KK, Ayoubi S, Al-Mefty O. Middle Fossa Approach for Resection of a Giant Trigeminal Schwannoma Through an Expanded Meckel Cave: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Mar 1;22(3):e122-e123. doi: 10.1227/ONS.0000000000000071. PMID: 35166719.
70. Emerson SN, Aversa A, Al-Mefty O. Sealing the Box: Microsurgical Repair of Skull Base Encephaloceles: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Apr 1;22(4):e159-e160. doi: 10.1227/ONS.0000000000000102. PMID: 35156943.
71. Mooney MA, Aboud E, Essayed W, Al-Mefty O. "Grade Zero" Removal of a Falcine Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Apr 1;22(4):e158. doi: 10.1227/ONS.0000000000000093. PMID: 35156944.
72. Essayed W, Harrison MJ, Aboud E, Al-Mefty O. Brainstem Pilocytic Astrocytoma, a Surgical Disease: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jun 1;22(6):e264. doi: 10.1227/ons.0000000000000157. Epub 2022 Apr 5. PMID: 35383702.
73. Emerson SN, Ibn-Essayed W, Al-Mefty O. Cavernous Hemangioma of the Cavernous Sinus-Same Pathology, Different Disease: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jun 1;22(6):e265-e266. doi: 10.1227/ons.0000000000000180. Epub 2022 Apr 11. PMID: 35404328.
74. Aversa A, Ibn Essayed W, Al-Mefty O. Resection of Skull Base Meningioma With Extensive Extracranial Extension: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jul 1;23(1):e51. doi: 10.1227/ons.0000000000000220. Epub 2022 Apr 20. PMID: 35726935.
75. Abunimer AM, Lak AM, Calvachi P, Smith TR, Aglio LS, Almefty KK, Dunn IF, Bi WL, Goldhaber SZ, Al-Mefty O. Early Detection and Management of Venous Thrombosis in Skull Base Surgery: Role of Routine Doppler Ultrasound Monitoring. *Neurosurgery*. 2022 Jul 1;91(1):115-122. doi: 10.1227/neu.0000000000001936. Epub 2022 Apr 7. PMID: 35383697.
76. Emerson SN, Scott RM, Al-Mefty O. Resolution of Primary or Recalcitrant Chiari-Associated Syringomyelia Requires Adequate Cerebrospinal Fluid Egress from the Fourth Ventricle. *World Neurosurg*. 2022 Jul;163:24. doi: 10.1016/j.wneu.2022.03.132. Epub 2022 Apr 6. PMID: 35398323.
77. Emerson SN, Toczykowski M, Al-Mefty O. Dejerine Syndrome Variant Due to Medullary Perforating Artery Ischemia During Foramen Magnum Meningioma Resection: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Jul 1;23(1):e52-e53. doi: 10.1227/ons.0000000000000211. Epub 2022 Apr 20. PMID: 35726936.
78. Jeelani Y, Ibn Essayed W, Al-Mefty O. Extended Transcondylar Approach With C-1 Lateral Mass Resection for the Removal of a Calcified Ventral "Spinocranial" Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Aug 1;23(2):e117-e118. doi: 10.1227/ons.0000000000000278. Epub 2022 May 9. PMID: 35838463.
79. Rassi MS, Al-Mefty O. Letter to the Editor: "The Treasure of Cushing's Records: I Would Rather Live with the Power of Observation than Die with Statistical Power". *World Neurosurg*. 2022 Aug;164:451-452. doi: 10.1016/j.wneu.2022.04.054. PMID: 35941767.
80. Aversa A, Najjar J, Al-Mefty O. Transcranial Approach to Invasive Giant Pituitary Adenoma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Sep 1;23(3):e160-e161. doi: 10.1227/ons.0000000000000318. Epub 2022 Jul 6. PMID: 35972094.
81. Essayed W, Borba LAB, Al-Mefty O. Simultaneous Endoscopic-Microscopic Skull Base Approach for the Resection of a Dumbbell-Shaped Hypoglossal Schwannoma: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Oct 1;23(4):e283. doi: 10.1227/ons.0000000000000329. Epub 2022 Jul 11. PMID: 36001476.
82. Emerson SN, Al-Mefty O. Resection of Giant Craniopharyngioma, Contending With Multiple Compartments and Myriad Perforating Arteries: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Nov 1;23(5):e320. doi: 10.1227/ons.0000000000000402. Epub 2022 Sep 14. PMID: 36227249.
83. Almefty KK, Mooney MA, Al-Mefty O, Essayed W, Bi WL, Cai L, Kadri PAS. Intracranial Facial Schwannomas: Multiple Distinct Entities Necessitating Tailored Management. *World Neurosurg*. 2022 Dec;168:e187-e195. doi: 10.1016/j.wneu.2022.09.082. Epub 2022 Sep 20. PMID: 36150600.
84. Emerson SN, Kadri PADS, Toczykowski M, Al-Mefty O. Inferior is Superior-Transtentorial Transcollateral Sulcus Approach to the Ventricular Atrium: 2-Dimensional Operative Video. *Oper Neurosurg* (Hagerstown). 2022 Dec 1;23(6):e369-e370. doi: 10.1227/ons.0000000000000433. Epub 2022 Sep 26. PMID: 36227201.
85. Luzzi S, Giotta Lucifero A, Rabski J, Kadri PAS, Al-Mefty O. The Party Wall: Redefining the Indications of Transcranial Approaches for Giant Pituitary Adenomas in Endoscopic Era. *Cancers* (Basel). 2023 Apr 10;15(8):2235. doi: 10.3390/cancers15082235. PMID: 37190164; PMCID: PMC10137094.

86. Luzzi S, Giotta Lucifero A, Rabski J, Kadri PAS, Al-Mefty O. The Party Wall: Redefining the Indications of Transcranial Approaches for Giant Pituitary Adenomas in Endoscopic Era. *Cancers (Basel)*. 2023 Apr 10;15(8):2235. doi: 10.3390/cancers15082235. PMID: 37190164; PMCID: PMC10137094.
87. Giotta Lucifero A, Luzzi S, Rabski J, Meredith D, Kadri PADS, Al-Mefty O. Surgical management of symptomatic hemangioma of the geniculate ganglion: fascicular-sparing resection or grafting? *Neurosurg Rev*. 2023 May 15;46(1):120. doi: 10.1007/s10143-023-02029-w. PMID: 37184718; PMCID: PMC10185618.
88. Giotta Lucifero A, Luzzi S, Rabski J, Meredith D, Kadri PADS, Al-Mefty O. Surgical management of symptomatic hemangioma of the geniculate ganglion: fascicular-sparing resection or grafting? *Neurosurg Rev*. 2023 May 15;46(1):120. doi: 10.1007/s10143-023-02029-w. PMID: 37184718; PMCID: PMC10185618.
89. Luzzi S, Giotta Lucifero A, Rabski J, Kadri PAS, Al-Mefty O. Fascicular-Sparing Technique for Resection of Cerebellopontine Angle Facial Nerve Schwannoma. *World Neurosurg*. 2023 May;173:4. doi: 10.1016/j.wneu.2023.02.042. Epub 2023 Feb 13. PMID: 36791878.
90. Al-Mefty O. Varieties of Chronic Subdural Hematoma and Glucocorticoid Treatment. *N Engl J Med*. 2023 Jun 15;388(24):2289-2290. doi: 10.1056/NEJMe2304797. PMID: 37314710
91. Rassi MS, Ribas ESC, Coelho VPM Junior, Essayed WI, Al-Mefty O, Figueiredo EG. Comparative Anatomic Study Between Intradural Suboccipital Retrosigmoid and Extradural Transzygomatic Middle Fossa Approaches to Expose the Trigeminal Nerve. *World Neurosurg*. 2023 Jul;175:e745-e753. doi: 10.1016/j.wneu.2023.04.014. Epub 2023 Apr 8. PMID: 37037369.
92. Edward Guo, Mehul Gupta, Sarthak Sinha BSc, Karl Rössler MD, Marcos Tatagiba MD, Ryojo Akagami, MD, Ossama Al-Mefty, MD, Taku Sugiyama MD, PhD Philip E. Stieg, PhD, MD, Gwynedd E. Pickett, MD, Madeleine de Lotbiniere-Bassett MD, Rahul Singh BSc, Sanju Lama MD, PhD, Garnette R. Sutherland MD. "NeuroGPT-X: Towards a Clinic-Ready Large Language Model". *Journal of Neurosurgery* 2023.
93. Giotta Lucifero A, Luzzi S, Rabski J, Meredith D, Kadri PADS, Al-Mefty O. Surgical management of symptomatic hemangioma of the geniculate ganglion: fascicular-sparing resection or grafting? *Neurosurg Rev*. 2023 May 15;46(1):120. doi: 10.1007/s10143-023-02029-w. PMID: 37184718; PMCID: PMC10185618.
94. Sabino Luzzi, Alice Giotta Lucifero, Kaith K. Almefty, Rami O. Almefty, Paulo A.S. Kadri, Ossama Al-Mefty, Supracerebellar "flyover" Approach to Dumbbell Falcotentorial Meningioma Encasing the Galenic Venous System, *World Neurosurgery*, 2023, ISSN 1878-8750, <https://doi.org/10.1016/j.wneu.2023.09.105>.
95. Wu KC, Guenette JP, Huang RY, Al-Mefty O, Dunn IF, Bi WL. Improved optic nerve visualization and treatment planning through a dedicated optic nerve MRI protocol. *Neurosurg Focus*. 2024 Apr;56(4):E9. doi: 10.3171/2024.1.FOCUS23715. PMID: 38560937.



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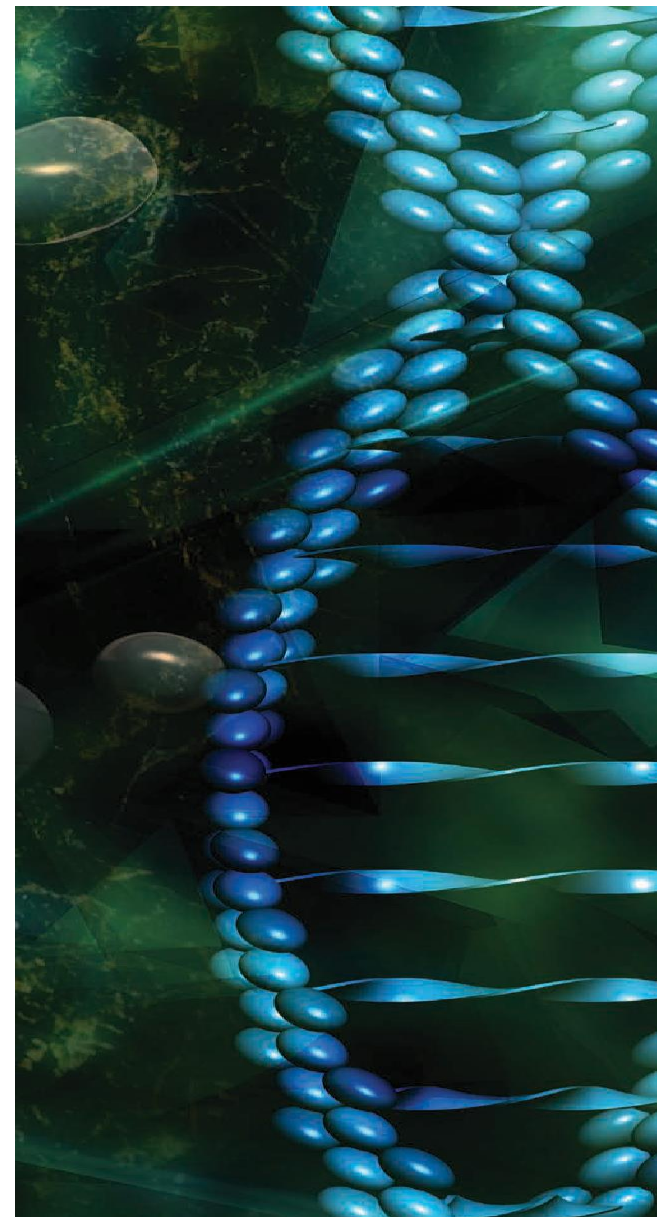
PUBLICATIONS

- Senders, J.T., Cho, L.D., Calvachi, P., McNulty, J.J., Ashby, J.L., Schulte, I.S., Almekkawi, A.K., Mehrtash, A., Gormley, W.B., Smith, T.R. Broekman, M.L. and Arnaout O, 2020. Automating Clinical Chart Review: An Open-Source Natural Language Processing Pipeline Developed on Free-Text Radiology Reports From Patients With Glioblastoma. *JCO Clinical Cancer Informatics*, 4, pp.25-34.
- Shi DD, Arnaout O, Bi WL, Buchbinder EI, Cagney DN, Insko ML, Liu D, Schoenfeld JD, Aizer AA. Severe Radiation Necrosis Refractory to Surgical Resection in Patients with Melanoma and Brain Metastases Managed with Ipilimumab/Nivolumab and Brain-Directed Stereotactic Radiation Therapy. *World Neurosurg.* 2020 Jul;139:226-231. doi: 10.1016/j.wneu.2020.04.087. Epub 2020 Apr 21. PMID: 32330622.
- Lak, Asad M., Hasan A. Zaidi, and Omar Arnaout. "Unexpected Resolution of a Symptomatic Tarlov Cyst Following Hysterectomy." *JAMA Neurology* (2020).
- Faulkner, H., Arnaout, O., Hoshide, R., Young, I.M., Yeung, J.T., Sughrie, M.E. and Teo, C., 2021. The Surgical Resection of Brainstem Glioma: Outcomes and Prognostic Factors. *World neurosurgery*, 146, pp.e639-e650.
- Olsen, H.E., Lynn, G.M., Valdes, P.A., Cerecedo Lopez, C.D., Ishizuka, A.S., Arnaout, O., Bi, W.L., Peruzzi, P.P., Chiocca, E.A., Friedman, G.K. and Bernstock, J.D., 2021. Therapeutic cancer vaccines for pediatric malignancies: advances, challenges, and emerging technologies. *Neuro-Oncology Advances*, 3(1), p.vdab027.
- McAvoy, M, Calvachi P, Kaczmarzyk J, Fernández I, McNulty J, Smith Y, Yu K, Gormley W, Arnaout O, Classifying MR Images of Glioblastoma versus Primary Central Nervous System Lymphoma using Convolutional Neural Networks [In Submission, *Journal of NeuroOncology*]
- Shi DD, Arnaout O, Bi WL, Buchbinder EI, Cagney DN, Insko ML, Liu D, Schoenfeld JD, Aizer AA. Severe Radiation Necrosis Refractory to Surgical Resection in Patients with Melanoma and Brain Metastases Managed with Ipilimumab/Nivolumab and Brain-Directed Stereotactic Radiation Therapy. *World Neurosurg.* 2020 Jul;139:226-231. doi: 10.1016/j.wneu.2020.04.087. Epub 2020 Apr 21. PMID: 32330622.
- Lak, Asad M., Hasan A. Zaidi, and Omar Arnaout. "Unexpected Resolution of a Symptomatic Tarlov Cyst Following Hysterectomy." *JAMA Neurology* (2020).
- Faulkner, H., Arnaout, O., Hoshide, R., Young, I.M., Yeung, J.T., Sughrie, M.E. and Teo, C., 2021. The Surgical Resection of Brainstem Glioma: Outcomes and Prognostic Factors. *World neurosurgery*, 146, pp.e639-e650.
- Olsen, H.E., Lynn, G.M., Valdes, P.A., Cerecedo Lopez, C.D., Ishizuka, A.S., Arnaout, O., Bi, W.L., Peruzzi, P.P., Chiocca, E.A., Friedman, G.K. and Bernstock, J.D., 2021. Therapeutic cancer vaccines for pediatric malignancies: advances, challenges, and emerging technologies. *Neuro-Oncology Advances*, 3(1), p.vdab027.
- McAvoy, M, Calvachi P, Kaczmarzyk J, Fernández I, McNulty J, Smith Y, Yu K, Gormley W, Arnaout O, Classifying MR Images of Glioblastoma versus Primary Central Nervous System Lymphoma using Convolutional Neural Networks [In Submission, *Journal of NeuroOncology*]
- Leaders, T., Veilleux, R., Costa, R.S., Chalk, G., Lane, K., Members, T., Arnaout, O., Pennington, M., Belategui, K., Berkley, M. and Slater, C., 2021. Post-Operative Craniotomy Pathway-PACU to Floor Pilot. *Journal of PeriAnesthesia Nursing*, 36(4), pp.e6-e7.
- Leaders, T., Veilleux, R., Costa, R.S., Chalk, G., Lane, K., Members, T., Arnaout, O., Pennington, M., Belategui, K., Berkley, M. and Slater, C., 2021. Post-Operative Craniotomy Pathway-PACU to Floor Pilot. *Journal of PeriAnesthesia Nursing*, 36(4), pp.e6-e7.
- Blitz, S.E., Kappel, A.D., Gessler, F.A., Klinger, N.V., Arnaout, O., Lu, Y., Peruzzi, P.P., Smith, T.R., Chiocca, E.A., Friedman, G.K. and Bernstock, J.D., 2022. Tumor-Associated Macrophages/Microglia in Glioblastoma Oncolytic Virotherapy: A Double-Edged Sword. *International Journal of Molecular Sciences*, 23(3), p.1808.
- Sarah E. Blitz, BS, J. Tanner McMahon, MD, Joshua I. Chalif, MD, PhD, Casey A. Jarvis, MD, David J. Segar, MD, Weston T. Northam, MD, Jason A. Chen, MD, PhD, Regan W. Bergmark, MD, Jennifer M. Davis, MD, Sigal Yawetz, MD, and Omar Arnaout, MD "Intracranial complications of hypercoagulability and superinfection in the setting of COVID-19: illustrative cases" *Journal of Neurosurgery: Case Lessons* 2022.
- Lim-Fat, M.J., Youssef, G.C., Touat, M., Iorgulescu, J.B., Whorral, S., Allen, M., Rahman, R., Chukwueke, U., McFaline-Figueroa, J.R., Nayak, L. and Lee, E.Q., 2022. Clinical utility of targeted next-generation sequencing assay in IDH-wildtype glioblastoma for therapy decision-making. *Neuro-oncology*, 24(7), pp.1140-1149
- Hulsbergen, A., Lo, Y.T., Kavouridis, V., Phillips, J., Smith, T., Verhoeff, J., Yu, K.H., Broekman, M. and Arnaout, O., 2020, November. Survival prediction after neurosurgical resection of brain metastases: a machine learning approach. In *neuro-oncology* (vol. 22, pp. 203-203). Journals dept, 2001 evans rd, cary, nc 27513 usa: oxford univ press inc.
- Boaro, A., Kaczmarzyk, J.R., Kavouridis, V.K., Harary, M., Mammi, M., Dawood, H., Shea, A., Cho, E.Y., Juvekar, P., Noh, T. and Rana, A., 2022. Deep neural networks allow expert-level brain meningioma segmentation and present potential for improvement of clinical practice. *Scientific reports*, 12(1), pp.1-9.
- Hulsbergen, A.F., Lo, Y.T., Awakimjan, I., Kavouridis, V.K., Phillips, J.G., Smith, T.R., Verhoeff, J.J., Yu, K.H., Broekman, M.L. and Arnaout, O., 2022. Survival prediction after neurosurgical resection of brain metastases: a machine learning approach. *Neurosurgery*, pp.10-1227.
- Migdady, I., Roy, A., Duskin, J.A., McKeown, M.E., Fischer, D., Barra, M.E., Schontz, M., Wongboonsin, J., Bevers, M.B., Arnaout, O. and Izzy, S., 2022. Volume replacement is associated with a diminished osmolar effect of mannitol in patients with acute brain injury. *Journal of Stroke and Cerebrovascular Diseases*, 31(12), p.106867.

24. Hulsbergen AFC, Lo YT, Awakimjan I, Kavouridis VK, Phillips JG, Smith TR, Verhoeff JJC, Yu KH, Broekman MLD, Arnaout O. Survival Prediction After Neurosurgical Resection of Brain Metastases: A Machine Learning Approach. *Neurosurgery*. 2022 Sep 1;91(3):381-388. doi: 10.1227/neu.0000000000002037. Epub 2022 May 26. PMID: 35608378.
25. H. Elhalawani, L.A. Hammoudeh, D.N. Cagney, J.M. Qian, A. Martin, J. Zgrabik, J. Meyers, K.J. Pataki, K. Martin, Y. Khouj, C. Verry, W.L. Bi, O. Arnaout, S.M. Christ, B. Alexander, S. Tanguturi, R. Rahman, D. Haas-Kogan and A.A. Aizer, 2022. Leveraging Serial MRI Radiomics and Machine Learning to Predict Risk of Radiation Necrosis in Patients with Brain Metastases Managed with Stereotactic Radiation and Immunotherapy. *International Journal of Radiation Oncology, Biology, Physics*, 114(3), p.e128.
26. Segar DJ, Bernstock JD, Arnaout O, Bi WL, Friedman GK, Langer R, Traverso G, Rampersad SM. Modeling of intracranial tumor treating fields for the treatment of complex high-grade gliomas. *Sci Rep*. 2023 Jan 30;13(1):1636. doi: 10.1038/s41598-023-28769-9. Erratum in: *Sci Rep*. 2023 Mar 9;13(1):3955. PMID: 36717682; PMCID: PMC9886948.
27. Hoffman, S.E., Gupta, S., O'Connor, M., Jarvis, C.A., Zhao, M., Hauser, B.M., Bernstock, J.D., Murphy, S., Raftery, S.M., Lane, K., Chiocca, E.A., Arnaout, O. 2023. Reduced time to imaging, length of stay, and hospital charges following implementation of a novel postoperative pathway for craniotomy. *Journal of Neurosurgery*, 1(aop), pp.1-12.
28. Ibn Essayed W, Jarvis CA, Bernstock JD, Slingerland A, Albanese J, Friedman GK, Arnaout O, Baird L. Positioning Transclival Tumor-Treating Fields for the Treatment of Diffuse Intrinsic Pontine Gliomas. *Life (Basel)*. 2023 Feb 21;13(3):601. doi: 10.3390/life13030601. PMID: 36983757; PMCID: PMC10059731.
29. Youssef G, Rahman R, Bay C, Wang W, Lim-Fat MJ, Arnaout O, Bi WL, Cagney DN, Chang YS, Cloughesy TF, DeSalvo M, Ellingson BM, Flood TF, Gerstner ER, Gonzalez Castro LN, Guenette JP, Kim AE, Lee EQ, McFaline-Figueroa JR, Potter CA, Reardon DA, Huang RY, Wen PY. Evaluation of Standard Response Assessment in Neuro-Oncology, Modified Response Assessment in Neuro-Oncology, and Immunotherapy Response Assessment in Neuro-Oncology in Newly Diagnosed and Recurrent Glioblastoma. *J Clin Oncol*. 2023 Apr 7;JCO2201579. doi: 10.1200/JCO.22.01579.

Epub ahead of print. PMID: 37027809.

30. Gupta S, Nawabi NL, Emani S, Medeiros L, Bernstock JD, Duvall J, Ng P, Smith TR, Wen PY, Reardon DA, Arnaout O. An expanded role for surgery in grade 3 1p/19q co-deleted oligodendroglioma. *Neurooncol Adv*. 2023 Apr 21;5(1):vdad046. doi: 10.1093/noonl/vdad046. PMID: 37215951; PMCID: PMC10195195.
31. Hoffman SE, Gupta S, Arnaout O. Postoperative Pathway Allows Elective Craniotomy Patients to Bypass Intensive Care Unit Safely: Commentary on Recent Article in Journal of Neurosurgery. *World Neurosurg*. 2023 May;173:276-277. doi: 10.1016/j.wneu.2023.02.126. Epub 2023 Feb 28. PMID: 37189307.



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PUBLICATIONS

1. Cerecedo-Lopez CD, Cantu-Aldana A, Patel NJ, Aziz-Sultan MA, Frerichs KU, Du R. Insulin in the Management of Acute Ischemic Stroke: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2020 Apr;136:e514-e534. doi: 10.1016/j.wneu.2020.01.056. Epub 2020 Jan 16. PMID: 31954893.
2. Silva MA, See AP, Sur S, Aziz-Sultan MA. Treatment of complex intracranial pathologies with transcirculation endovascular approaches. *Neurocirugia (Astur : Engl Ed)*. 2020 Jul-Aug;31(4):173-183. English, Spanish. doi: 10.1016/j.neucir.2019.10.003. Epub 2020 Jan 24. PMID: 31987753.
8. Silva MA, Lai PMR, Du R, Aziz-Sultan MA, Patel NJ. The Ruptured Arteriovenous Malformation Grading Scale (RAGS): An Extension of the Hunt and Hess Scale to Predict Clinical Outcome for Patients With Ruptured Brain Arteriovenous Malformations. *Neurosurgery*. 2020 Aug 1;87(2):193-199. doi: 10.1093/neuros/nyz404. PMID: 31586199.
9. Baker C, Grandhi R, Griessenauer CJ, Dmytriw AA, Kapadia A, Yang VXD, Ghorbani M, Chen K, Aziz-Sultan MA, Rinaldo L, Lanzino G, Brinjikji W, Taussky P. Pipeline Embolization in Patients with Posterior Circulation Subarachnoid Hemorrhages: Is Takotsubo Cardiomyopathy a Limiting Factor? *World Neurosurg*. 2020 Nov;143:e523-e528. doi: 10.1016/j.wneu.2020.08.013. Epub 2020 Aug 7. PMID: 32777393.
10. Griessenauer CJ, Enriquez-Marulanda A, Taussky P, Biswas A, Grandhi R, Xiang S, Hong T, Rinaldo L, Lanzino G, Brinjikji W, Burkhardt JK, Kan P, Ghuman M, Yang VXD, Chen K, Aziz-Sultan MA, Ghorbani M, Schirmer CM, Goren O, Dalal SS, Killer-Oberpfalzer M, Müller-Thies-Broussalis E, Koch MJ, Stapleton CJ, Patel AB, Foreman PM, Cress MC, Hirschl RA, Krings T, Zhang H, Dmytriw AA. Experience With the Pipeline Embolization Device for Posterior Circulations Aneurysms: A Multicenter Cohort Study. *Neurosurgery*. 2020 Nov 16;87(6):1252-1261. doi: 10.1093/neuros/nyaa277. PMID: 32629474.
11. Chua MMJ, Gupta S, Essayed W, Donnelly DJ, Ziayee H, Vicenty-Padilla J, Das AS, Lai RPM, Izzy S, Aziz-Sultan MA. Endovascular treatment of a ruptured posterior fossa pure arterial malformation: illustrative case. *J Neurosurg Case Lessons*. 2021 Jan 11;1(2):CASE2073. doi: 10.3171/CASE.2073. PMID: 35854927; PMCID: PMC9241320.

12. Lai PMR, Ng I, Gormley WB, Patel NJ, Frerichs KU, Aziz-Sultan MA, Du R. Familial Predisposition and Differences in Radiographic Patterns in Spontaneous Nonaneurysmal Subarachnoid Hemorrhage. *Neurosurgery*. 2021 Jan 13;88(2):413-419. doi: 10.1093/neuros/nyaa396. PMID: 33017030.
13. Griessenauer CJ, Enriquez-Marulanda A, Xiang S, Hong T, Zhang H, Tausky P, Grandhi R, Waqas M, Tutino VM, Siddiqui AH, Levy EI, Ogilvy CS, Thomas AJ, Ulfert C, Möhlenbruch MA, Renieri L, Limbucci N, Parra-Fariñas C, Burkhardt JK, Kan P, Rinaldo L, Lanzino G, Brinjikji W, Spears J, Müller-Thies-Broussalis E, Killer-Oberpfalzer M, Islak C, Kocer N, Sonnberger M, Engelhorn T, Ghuman M, Yang VX, Salehani A, Harrigan MR, Radovanovic I, Pereira VM, Krings T, Matouk CC, Chen K, Aziz-Sultan MA, Ghorbani M, Schirmer CM, Goren O, Dalal SS, Koch MJ, Stapleton CJ, Patel AB, Finkenzeller T, Holtmannspötter M, Buhk JH, Foreman PM, Cress M, Hirschl R, Reith W, Simgen A, Janssen H, Marotta TR, Dmytriw AA. Comparison of PED and FRED flow diverters for posterior circulation aneurysms: a propensity score matched cohort study. *J Neurointerv Surg*. 2021 Feb;13(2):153-158. doi: 10.1136/neurintsurg-2020-016055. Epub 2020 Jul 1. PMID: 32611622.
14. Wu KC, Sunwoo J, Sherif F, Farzam P, Farzam PY, Orihuela-Espina F, LaRose SL, Monk AD, Aziz-Sultan MA, Patel N, Vaitkevicius H, Franceschini MA. Validation of diffuse correlation spectroscopy measures of critical closing pressure against transcranial Doppler ultrasound in stroke patients. *J Biomed Opt*. 2021 Mar;26(3):036008. doi: 10.1117/1.JBO.26.3.036008. PMID: 33774980; PMCID: PMC7998065.
15. Bernier TD, Schontz MJ, Izzy S, Chung DY, Nelson SE, Leslie-Mazwi TM, Henderson GV, Dasenbrock H, Patel N, Aziz-Sultan MA, Feske S, Du R, Abulhasan YB, Angle MR. Treatment of Subarachnoid Hemorrhage-associated Delayed Cerebral Ischemia With Milrinone: A Review and Proposal. *J Neurosurg Anesthesiol*. 2021 Jul 1;33(3):195-202. doi: 10.1097/ANA.0000000000000755. PMID: 33480639; PMCID: PMC8192346.
16. Mooney MA, Ibn Essayed W, Aziz-Sultan MA, Al-Mefty O. Concomitant Embolization and Microsurgical Resection of a Giant, Hypervascular Skull Base Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jul 15;21(2):E97-E98. doi: 10.1093/ons/opab128. PMID: 33930164.
17. Lai PMR, Patel NJ, Frerichs KU, Patel AB, Aziz-Sultan MA, Ogilvy CS, Du R. Direct vs Indirect Revascularization in a North American Cohort of Moyamoya Disease. *Neurosurgery*. 2021 Jul 15;89(2):315-322. doi: 10.1093/neuros/nyab156. PMID: 33957674.
18. Meyers PM, Fifi JT, Cockroft KM, Miller TR, Given CA, Zomorodi AR, Jagadeesan BD, Mokin M, Kan P, Yao TL, Diaz O, Huddle D, Bellon RJ, Seinfeld J, Polifka AJ, Fiorella D, Chitale RV, Kvamme P, Morrow JT, Singer J, Wakhloo AK, Puri AS, Deshmukh VR, Hanel RA, Gonzalez LF, Woo HH, Aziz-Sultan MA. Safety of the APOLLO Onyx delivery microcatheter for embolization of brain arteriovenous malformations: results from a prospective post-market study. *J Neurointerv Surg*. 2021 Oct;13(10):935-941. doi: 10.1136/neurintsurg-2020-016830. Epub 2021 Feb 1. PMID: 33526480.
19. 19: Lai PMR, Ng I, Gormley WB, Patel N, Frerichs KU, Aziz-Sultan MA, Du R. Cannabis Use and Increased Nonaneurysmal Subarachnoid Hemorrhage in the Past Decade. *World Neurosurg*. 2021 Oct;154:e580-e589. doi: 10.1016/j.wneu.2021.07.079. Epub 2021 Jul 27. PMID: 34325028.
20. Gupta S, Vicenty-Padilla J, Lai PMR, Zhou X, Bernstock JD, Chua M, Izzy S, Aziz-Sultan MA, Du R, Patel NJ. Posterior Cerebral Artery Aneurysm Re-Rupture Following Revascularization for Moyamoya Disease. *J Stroke Cerebrovasc Dis*. 2021 Nov;30(11):106048. doi: 10.1016/j.jstrokecerebrovasdis.2021.106048. Epub 2021 Sep 14. PMID: 34534774.
21. Dmytriw AA, Diestro JDB, Dibas M, Phan K, Sweid A, Cuellar-Saenz HH, Lay SV, Guenego A, Renieri L, Al Balushi A, Sundararajan SH, Carnevale J, Saliou G, Möhlenbruch M, Vranic JE, Harker P, Rabinov JD, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Abbas R, Inoue Y, Capirossi C, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Regenhardt RW, Ghozy S, Alotaibi NM, Tjoumakaris S, Starke RM, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Ulfert C, Asadi H, Brooks M, Maingard J, Jhamb A, Siddiqui A, Ducruet AF, Albuquerque FC, Kan P, Kalousek V, Lylyk P, Savardekar A, Boddu S, Knopman J, Limbucci N, Chen KS, Aziz-Sultan MA, Stapleton CJ, Jabbour P, Cognard C, Patel AB, Adeeb N. International Study of Intracranial Aneurysm Treatment Using Woven EndoBridge: Results of the WorldWideWEB Consortium. *Stroke*. 2022 Feb;53(2):e47-e49. doi: 10.1161/STROKEAHA.121.037609. Epub 2021 Dec 17. Erratum in: *Stroke*. 2022 Mar;53(3):e128. PMID: 34915737; PMCID: PMC8792251.
22. Dibas M, Adeeb N, Diestro JDB, Cuellar HH, Sweid A, Lay SV, Guenego A, Aslan A, Renieri L, Sundararajan SH, Saliou G, Möhlenbruch M, Regenhardt RW, Vranic JE, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan AE, Salehani A, Sporns P, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Stapleton CJ, Siddiqui A, Ducruet AF, Albuquerque FC, Kan P, Kalousek V, Lylyk P, Boddu S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, Patel AB, Dmytriw AA. Transradial versus transfemoral access for embolization of intracranial aneurysms with the Woven EndoBridge device: a propensity score- matched study. *J Neurosurg*. 2022 Feb 4:1-8. doi: 10.3171/2021.12.JNS212293. Epub ahead of print. PMID: 35120326.
23. Dmytriw AA, Dibas M, Phan K, Efendizade A, Ospel J, Schirmer C, Settecase F, Heran MKS, Kühn AL, Puri AS, Menon BK, Sivakumar S, Mowla A, Vela-Duarte D, Linfante I, Dabus GC, Regenhardt RW, D'Amato S, Rosenthal JA, Zha A, Talukder N, Sheth SA, Hassan AE, Cooke DL, Leung LY, Malek AM, Voetsch B, Sehgal S, Wakhloo AK, Goyal M, Wu H, Cohen J, Ghozy S, Turkel-Parella D, Farooq Z, Vranic JE, Rabinov JD, Stapleton CJ, Minhas R, Velayudhan V, Chaudhry ZA, Xavier A, Bullrich MB, Pandey S, Sposato LA, Johnson SA, Gupta G, Khandelwal P, Ali L, Liebeskind DS, Farooqui M, Ortega-Gutierrez S, Nahab F, Jillella DV, Chen K, Aziz-Sultan MA, Abdalkader M, Kaliev A, Nguyen TN, Haussen DC, Nogueira RG, Haq IU, Zaidat OO, Sanborn E, Leslie-Mazwi TM, Patel AB, Siegler JE, Tiwari A; North American Neurovascular COVID-19 (NAN-C) Consortium & Society of Vascular and Interventional Neurology (SVIN) Investigators. Acute ischaemic stroke associated with SARS-CoV-2 infection in North America. *J Neurol Neurosurg Psychiatry*. 2022 Apr;93(4):360-368. doi: 10.1136/jnnp-2021-328354. Epub 2022 Jan 25. PMID: 35078916; PMCID: PMC8804309.
24. Lak AM, Cerecedo-Lopez CD, Cha J, Aziz-Sultan MA, Frerichs KU, Gormley WB, Mekary RA, Du R, Patel NJ. Seizure Outcomes After Interventional Treatment in Cerebral Arteriovenous Malformation-Associated Epilepsy: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2022 Apr;160:e9-e22. doi: 10.1016/j.wneu.2021.09.063. PMID: 35364673
25. Lai PMR, Gomez-Paz S, Patel NJ, Frerichs KU, Thomas AJ, Aziz-Sultan MA, Patel AB, Ogilvy CS, Du R. Asymptomatic Moyamoya Disease in a North American Adult Cohort. *World Neurosurg*. 2022 May;161:e146-e153. doi: 10.1016/j.wneu.2022.01.076. Epub 2022 Jan 29. PMID: 35092810.
26. Srinivasan VM, Dmytriw AA, Regenhardt RW, Vicenty-Padilla J, Alotaibi NM, Levy E, Waqas M, Cherian J, Johnson JN, Jabbour P, Sweid A, Gross B, Starke RM, Puri A, Massari F, Griessenauer CJ, Catapano JS, Rutledge C, Tanweer O, Yashar P, Cortez GM, Aziz-Sultan MA, Patel AB, Ducruet AF, Albuquerque FC, Hanel RA, Lawton MT, Kan P. Retreatment of Residual and Recurrent Aneurysms After Embolization With the Woven EndoBridge Device: Multicenter Case Series. *Neurosurgery*. 2022 May 1;90(5):569-580. doi: 10.1227/neu.0000000000001883. PMID: 35244028; PMCID: PMC9524592.
27. Cerecedo-Lopez CD, Ng I, Nguyen HB, Lai PMR, Gormley WB, Patel N, Frerichs KU, Aziz-Sultan MA, Du R. Incidence and Outcomes of Registry-Based Acute Myocardial Infarction After Aneurysmal Subarachnoid Hemorrhage. *Neurocrit Care*. 2022 Jun;36(3):772-780. doi: 10.1007/s12028-021-01365-3. Epub 2021 Oct 25. PMID: 34697769.
28. abbour P, Dmytriw AA, Sweid A, Piotin M, Bekelis K, Sourour N, Raz E, Linfante I, Dabus G, Kole M, Martínez-Galdámez M, Nimjee SM, Lopes DK, Hassan AE, Kan P, Ghorbani M, Levitt MR, Escalard S, Missios S, Shapiro M, Clarençon F, Elhorany M, Vela-Duarte D, Tahir RA, Youssef PP, Pandey AS, Starke RM, El Naamani K, Abbas R, Hammoud B, Mansour OY, Galvan J, Billingsley JT, Mortazavi A, Walker M, Dibas M, Settecase F, Heran MKS, Kuhn AL, Puri AS, Menon BK, Sivakumar S, Mowla A, D'Amato S, Zha AM, Cooke D, Goyal M, Wu H, Cohen J, Turkel-Parrella D, Xavier A, Waqas M, Tutino VM, Siddiqui A, Gupta G, Nanda A, Khandelwal P, Tiu C, Portela PC, Perez de la Ossa N, Urta X, de Lera M, Arenillas JF, Ribo M, Requena M, Piano M, Pero G, De Sousa K, Al-Mufti F, Hashim Z, Nayak S, Renieri L, Aziz-Sultan MA, Nguyen TN, Feineigle P, Patel AB, Siegler JE, Badih K, Grossberg JA, Saad H, Gooch MR, Herial NA, Rosenwasser RH, Tjoumakaris S, Tiwari A. Characteristics of a COVID-19 Cohort With Large Vessel Occlusion: A Multicenter International Study. *Neurosurgery*. 2022 Jun 1;90(6):725-733. doi: 10.1227/neu.0000000000001902. Epub 2022 Mar 7. PMID: 35238817; PMCID: PMC9514728.
29. Nawabi NLA, Duey AH, Kilgallon JL, Jessurun C, Doucette J, Mekary RA, Aziz-Sultan MA. Effects of the COVID-19 pandemic on stroke response times: a systematic review and meta-analysis. *J Neurointerv Surg*. 2022 Jul;14(7):642-649. doi: 10.1136/neurintsurg-2021-018230. Epub 2022 Apr 6. PMID: 35387860.

30. Diestro JDB, Dibas M, Adeeb N, Regenhardt RW, Vranic JE, Guenego A, Lay SV, Renieri L, Al Balushi A, Shotar E, Premat K, El Naamani K, Saliou G, Möhlenbruch MA, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Rai H, Tutino VM, Mirshani S, Ghozy S, Harker P, Alotaibi NM, Rabinov JD, Ren Y, Schirmer CM, Goren O, Piano M, Kuhn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Nguyen A, Jones J, Psychogios M, Spears J, Parra-Fariñas C, Bres Bullrich M, Mayich M, Salem MM, Burkhardt JK, Jankowitz BT, Domingo RA, Huynh T, Tawk R, Ulfert C, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Siddiqui A, Ducruet AF, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Boddu SR, Stapleton CJ, Knopman J, Jabbour P, Tjournakaris S, Clarençon F, Limbucci N, Aziz-Sultan MA, Cuellar-Saenz HH, Cognard C, Patel AB, Dmytriw AA. Intracranial flow disruption for ruptured aneurysms: an international multicenter study. *J Neurointerv Surg.* 2022 Jul 22;neurintsurg-2022-019153. doi: 10.1136/jnis-2022-019153. Epub ahead of print. PMID: 35868856
31. Adeeb N, Dibas M, Diestro JDB, Cuellar-Saenz HH, Sweid A, Kandregula S, Lay SV, Guenego A, Renieri L, Sundararajan SH, Saliou G, Aslan A, Möhlenbruch M, Vranic JE, Regenhardt RW, Savardekar A, Mamilly A, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Parra Farinas C, Tutino VM, Inoue Y, Mirshahi S, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Sporns P, Brehm A, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Stapleton CJ, Siddiqui A, Ducruet AF, Albuquerque FC, Kan P, Kalousek V, Lylyk P, Boddu S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, Patel AB, Dmytriw AA. Multicenter Study for the Treatment of Sidewall versus Bifurcation Intracranial Aneurysms with Use of Woven EndoBridge (WEB). *Radiology.* 2022 Aug;304(2):372-382. doi: 10.1148/radiol.212006. Epub 2022 Apr 19. PMID: 35438564.
32. Nawabi NLA, Kilgallon JL, Duey AH, Medeiros LJ, Aziz-Sultan MA. Perspective: Patient Apprehensions Prolonged Stroke Presentation During the COVID-19 Pandemic. *World Neurosurg.* 2022 Aug;164:241-242. doi: 10.1016/j.wneu.2022.05.083. Epub 2022 May 23. PMID: 35691086; PMCID: PMC9126612.
33. Dmytriw AA, Dibas M, Ghozy S, Adeeb N, Diestro JDB, Phan K, Cuellar-Saenz HH, Sweid A, Lay SV, Guenego A, Renieri L, Al Balushi A, Saliou G, Möhlenbruch M, Regenhardt RW, Vranic JE, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Sporns P, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Stapleton CJ, Siddiqui A, Ducruet AF, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Boddu S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, Patel AB, Dmytriw AA. Correction to: The Woven EndoBridge (WEB) Device for the Treatment of Intracranial Aneurysms: Ten Years of Lessons Learned and Adjustments in Practice from the WorldWideWEB Consortium. *Transl Stroke Res.* 2022 Sep 27. doi: 10.1007/s12975-022-01086-5. Epub ahead of print. Erratum for: *Transl Stroke Res.* 2022 Sep 6;: PMID: 36168083.
34. Dmytriw AA, Ghozy S, Sweid A, Piotin M, Bekelis K, Sourour N, Raz E, Vela- Duarte D, Linfante I, Dabus G, Kole M, Martínez-Galdámez M, Nimjee SM, Lopes DK, Hassan AE, Kan P, Ghorbani M, Levitt MR, Escalard S, Missios S, Shapiro M, Clarençon F, Elhorany M, Tahir RA, Youssef PP, Pandey AS, Starke RM, El Naamani K, Abbas R, Mansour OY, Galvan J, Billingsley JT, Mortazavi A, Walker M, Dibas M, Settecase F, Heran MKS, Kuhn AL, Puri AS, Menon BK, Sivakumar S, Mowla A, D'Amato S, Zha AM, Cooke D, Vranic JE, Regenhardt RW, Rabinov JD, Stapleton CJ, Goyal M, Wu H, Cohen J, Turkel-Parella D, Xavier A, Waqas M, Tutino V, Siddiqui A, Gupta G, Nanda A, Khandelwal P, Tiu C, Portela PC, Perez de la Ossa N, Urta X, de Lera M, Arenillas JF, Ribo M, Requena M, Piano M, Pero G, De Sousa K, Al- Mufti F, Hashim Z, Nayak S, Renieri L, Du R, Aziz-Sultan MA, Liebeskind D, Nogueira RG, Abdalkader M, Nguyen TN, Vigilante N, Siegler JE, Grossberg JA, Saad H, Gooch MR, Herial NA, Rosenwasser RH, Tjournakaris S, Patel AB, Tiwari A, Jabbour P; North American Neurovascular COVID-19 (NAN-C) Consortium & Society of Vascular and Interventional Neurology (SVIN) Investigators. International controlled study of revascularization and outcomes following COVID-positive mechanical thrombectomy. *Eur J Neurol.* 2022 Nov;29(11):3273-3287. doi: 10.1111/ene.15493. Epub 2022 Jul 26. PMID: 35818781; PMCID: PMC9349405.
35. Adeeb N, Dibas M, Griessenauer CJ, Cuellar HH, Salem MM, Xiang S, Enriquez-Marulanda A, Hong T, Zhang H, Tausky P, Grandhi R, Waqas M, Aldine AS, Tutino VM, Aslan A, Siddiqui AH, Levy EI, Ogilvy CS, Thomas AJ, Ulfert C, Möhlenbruch MA, Renieri L, Bengzon Diestro JD, Lanzino G, Brinjikji W, Spears J, Vranic JE, Regenhardt RW, Rabinov JD, Harker P, Müller-Thies-Broussalis E, Killer-Oberpfalzer M, Islak C, Kocer N, Sonnberger M, Engelhorn T, Kapadia A, Yang VXD, Salehani A, Harrigan MR, Krings T, Matouk CC, Mirshahi S, Chen KS, Aziz-Sultan MA, Ghorbani M, Schirmer CM, Goren O, Dalal SS, Finkenzeller T, Holtmannspötter M, Buhk JH, Foreman PM, Cress MC, Hirschl RA, Reith W, Simgen A, Janssen H, Marotta TR, Stapleton CJ, Patel AB, Dmytriw AA. Learning Curve for Flow Diversion of Posterior Circulation Aneurysms: A Long-Term International Multicenter Cohort Study. *AJNR Am J Neuroradiol.* 2022 Nov;43(11):1615-1620. doi:10.3174/ajnr.A7679. Epub 2022 Oct 13. PMID: 36229166; PMCID: PMC9731249.
36. Lai PMR, Ryu JY, Park SC, Gross BA, Dickinson LD, Dagen S, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Blackburn S, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Frerichs KU, Niemela M, Ojemann SG, Patel NJ, Shi X, Valle-Giler EP, Wang AC, Welch BG, Zusman EE, Weiss ST, Du R. Somatic Variants in SVIL in Cerebral Aneurysms. *Neurol Genet.* 2022 Nov 28;8(6):e200040. doi: 10.1212/NXG.000000000200040. PMID: 36475054; PMCID: PMC9720733.
37. Ammar A, Nawabi NLA, Hamzah R, Berger C, Jaweed M, Park KB, Rosseau G, Khan T, Monawari S, Pirzad AF, Aziz-Sultan MA. The Current State of Neurosurgery in Afghanistan. *World Neurosurg.* 2023 Jan;169:110-117.e1. doi: 10.1016/j.wneu.2022.10.048. Epub 2022 Oct 19. PMID: 36270595.
38. El Naamani K, Mastorakos P, Adeeb N, Lan M, Castiglione J, Khanna O, Diestro JDB, McLellan RM, Dibas M, Vranic JE, Aslan A, Cuellar-Saenz HH, Guenego A, Carnevale J, Saliou G, Ulfert C, Möhlenbruch M, Foreman PM, Vachhani JA, Hafeez MU, Waqas M, Tutino VM, Rabinov JD, Ren Y, Michelozzi C, Spears J, Panni P, Griessenauer CJ, Asadi H, Regenhardt RW, Stapleton CJ, Ghozy S, Siddiqui A, Patel NJ, Kan P, Boddu S, Knopman J, Aziz-Sultan MA, Zanaty M, Ghosh R, Abbas R, Amlay A, Tjournakaris SI, Gooch MR, Cancelliere NM, Herial NA, Rosenwasser RH, Zarzour H, Schmidt RF, Pereira VM, Patel AB, Jabbour P, Dmytriw AA; WorldWideWEB Consortium. Long-Term Follow-Up of Cerebral Aneurysms Completely Occluded at 6 Months After Intervention with the Woven EndoBridge (WEB) Device: a Retrospective Multicenter Observational Study. *Transl Stroke Res.* 2023 May 11. doi: 10.1007/s12975-023-01153-5. Epub ahead of print. PMID: 37165289.
39. Adeeb N, Dibas M, Diestro JDB, Phan K, Cuellar-Saenz HH, Sweid A, Lay SV, Guenego A, Aslan A, Renieri L, Sundararajan SH, Saliou G, Möhlenbruch M, Regenhardt RW, Vranic JE, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kuhn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Brehm A, MohammedAli M, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Siddiqui A, Ducruet A, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Stapleton CJ, Boddu S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, Patel AB, Dmytriw AA. Comparing treatment outcomes of various intracranial bifurcation aneurysms locations using the Woven EndoBridge (WEB) device. *J Neurointerv Surg.* 2023 Jun;15(6):558-565. doi: 10.1136/neurintsurg-2022-018694. Epub 2022 Apr 28. PMID: 35483912.
40. Fiorella D, Molyneux A, Coon A, Szikora I, Saatci I, Baltacioglu F, Aziz-Sultan MA, Hoit D, Delgado Almandoz JE, Elijovich L, Cekirge HS, Byrne J, Klisch J, Arthur AS. Safety and effectiveness of the Woven EndoBridge (WEB) system for the treatment of wide necked bifurcation aneurysms: final 5 year results of the pivotal WEB Intra-saccular Therapy study (WEB-IT). *J Neurointerv Surg.* 2023 Jun 24;jnis-2023-020611. doi: 10.1136/jnis-2023-020611. Epub ahead of print. PMID: 37355252.
41. Dmytriw AA, Dibas M, Ghozy S, Adeeb N, Diestro JDB, Phan K, Cuellar-Saenz HH, Sweid A, Lay SV, Guenego A, Renieri L, Al Balushi A, Saliou G, Möhlenbruch M, Regenhardt RW, Vranic JE, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Sporns P, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Stapleton CJ, Siddiqui A, Ducruet AF, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Boddu S, Tjournakaris S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, Patel AB. The Woven EndoBridge (WEB) Device for the Treatment of Intracranial Aneurysms: Ten Years of Lessons Learned and Adjustments in Practice from the WorldWideWEB Consortium. *Transl Stroke Res.* 2023 Aug;14(4):455-464. doi: 10.1007/s12975-022-01072-x. Epub 2022 Sep 6. Erratum in: *Transl Stroke Res.* 2022 Sep 27;: PMID: 36066701.
42. Lak AM**, Cerecedo-Lopez CD, Cha J, Aziz-Sultan MA, Frerichs KU, Gormley WB, Mekary RA, Du R, Patel NJ. Seizure Outcomes After Interventional Treatment in Cerebral Arteriovenous Malformation-Associated Epilepsy: A Systematic Review and Meta-Analysis. *World Neurosurg.* 2022 April 16; PMID 35364673
43. Nawabi NLA**, Duey AH, Kilgallon JL, Jessurun C, Doucette J, Mekary RA, Aziz-Sultan MA. Effects of the COVID-19 Pandemic on Stroke Response Times: A Systemic Review and Meta Analysis. *J Neurointerv Surg.* 2022 April 19; PMID 35387860

44. Nimer Adeeb , Mahmoud Dibas , Jose Danilo Bengzon Diestro , Hugo H Cuellar-Saenz , Ahmad Sweid , Sandeep Kandregula , Sovann V Lay , Adrien Guenego , Leonardo Renieri , Sri Hari Sundararajan , Guillaume Saliou , Assala Aslan , Markus Möhlenbruch , Justin E Vranic , Robert W Regenhardt , Amey Savardekar , Ahmed Mamilly 1 Ivan Lylyk , Paul M Foreman , Jay A Vachhani , Vedran Župančić , Muhammad U Hafeez , Caleb Rutledge , Muhammad Waqas , Carmen Parra Farinas , Vincent M Tutino , Yasuaki Inoue , Shervin Mirshahi , James D Rabinov , Yifan Ren , Clemens M Schirmer , Mariangela Piano , Anna L Kühn , Caterina Michelozzi , Stéphanie Elens , Robert M Starke , Ameer Hassan , Arsalaan Salehani , Peter Sporns , Alex Brehm , Jesse Jones , Marios Psychogios , Julian Spears , Boris Lubicz , Pietro Panni , Ajit S Puri , Guglielmo Pero , Christoph J Griessenauer , Hamed Asadi , Christopher J Stapleton , Adnan Siddiqui , Andrew F Ducruet , Felipe C Albuquerque , Peter Kan , Vladimir Kalousek , Pedro Lylyk , Srikanth Boddu , Jared Knopman , Mohammad A Aziz-Sultan , Nicola Limbucci , Pascal Jabbour , Christophe Cognard , Aman B Patel , Adam A Dmytriw ; WorldWideWEB Consortium. Multicenter Study for the Treatment of Sidewall vs. Bifurcation Intracranial Aneurysms with Use of Woven EndoBridge (WEB). *Radiology*. 2022 April 19; PMID: 35438564
45. Adeeb N, Dibas M, Diestro JDB, Phan K, Cuellar-Saenz HH, Sweid A, Lay SV, Guenego A, Aslan A, Renieri L, Sundararajan SH, Saliou G, Möhlenbruch M, Regenhardt RW, Vranic JE, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kuhn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Brehm A, MohammedAli M, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Siddiqui A, Ducruet A, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Stapleton CJ, Boddu S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, Patel AB, Dmytriw AA. Comparing treatment outcomes of 44 various intracranial bifurcation aneurysm's locations using the Woven EndoBridge (WEB) device. *J Neurointerv Surg*. 2022 Apr 28 PMID: 35483912.
46. Dmytriw AA**, Ghozy S, Sweid A, Piotin M, Bekelis K, Sourour N, Raz E, Vela-Duarte D, Linfante I, Dabus G, Kole M, Martínez-Galdámez M, Nimjee SM, Lopes DK, Hassan AE, Kan P, Ghorbani M, Levitt MR, Escalard S, Missios S, Shapiro M, Clarençon F, Elhorany M, Tahir RA, Youssef PP, Pandey AS, Starke RM, El Naamani K, Abbas R, Mansour OY, Galvan J, Billingsley JT, Mortazavi A, Walker M, Dibas M, Settecase F, Heran MKS, Kuhn AL, Puri AS, Menon BK, Sivakumar S, Mowla A, D'Amato S, Zha AM, Cooke D, Vranic JE, Regenhardt RW, Rabinov JD, Stapleton CJ, Goyal M, Wu H, Cohen J, Turkel-Parella D, Xavier A, Waqas M, Tutino V, Siddiqui A, Gupta G, Nanda A, Khandelwal P, Tiu C, Portela PC, Perez de la Ossa N, Urta X, de Lera M, Arenillas JF, Ribo M, Requena M, Piano M, Pero G, De Sousa K, Al-Mufti F, Hashim Z, Nayak S, Renieri L, Du R, Aziz-Sultan MA, Liebeskind D, Nogueira RG, Abdalkader M, Nguyen TN, Vigilante N, Siegler JE, Grossberg JA, Saad H, Gooch MR, Herial NA, Rosenwasser RH, Tjoumakaris S, Patel AB, Tiwari A, Jabbour P; North American Neurovascular COVID-19 (NAN-C) Consortium & Society of Vascular and Interventional Neurology (SVIN) Investigators. International controlled study of revascularization and outcomes following COVID-positive mechanical thrombectomy. *Eur J Neurol*. 2022 Nov 29 PMID: 35818781.
47. Diestro JDB, Dibas M, Adeeb N, Regenhardt RW, Vranic JE, Guenego A, Lay SV, Renieri L, Al Balushi A, Shotar E, Premat K, El Naamani K, Saliou G, Möhlenbruch MA, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Rai H, Tutino VM, Mirshahi S, Ghozy S, Harker P, Alotaibi NM, Rabinov JD, Ren Y, Schirmer CM, Goren O, Piano M, Kuhn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Nguyen A, Jones J, Psychogios M, Spears J, Parra-Fariñas C, Bres Bullrich M, Mayich M, Salem MM, Burkhardt JK, Jankowitz BT, Domingo RA, Huynh T, Tawk R, Ulfert C, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Siddiqui A, Ducruet AF, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Boddu SR, Stapleton CJ, Knopman J, Jabbour P, Tjoumakaris S, Clarençon F, Limbucci N, Aziz-Sultan MA, Cuellar-Saenz HH, Cognard C, Patel AB, Dmytriw AA. Intracranial flow disruption for ruptured aneurysms: an international multicenter study. *J Neurointerv Surg*. 2022 Jul 22 PMID: 35868856.
48. Nguyen TN, Qureshi MM, Klein P, Yamagami H, Mikulik R, Etmnan N, Abdalkader M, Aziz-Sultan MA (204th of 274 authors) Global impact of the COVID-19 pandemic on subarachnoid haemorrhage hospitalisations, aneurysm treatment and in-hospital mortality: 1-year follow-up. *J Neurol Neurosurg Psychiatry*. 2022 Jul 28. PMID: 35902229.
49. Dmytriw AA, Dibas M, Ghozy S, Adeeb N, Diestro JDB, Phan K, Cuellar-Saenz HH, Sweid A, Lay SV, Guenego A, Renieri L, Al Balushi A, Saliou G, Möhlenbruch M, Regenhardt RW, Vranic JE, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Sporns P, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Stapleton CJ, Siddiqui A, Ducruet AF, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Boddu S, Tjoumakaris S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, Patel AB. The Woven EndoBridge (WEB) Device for the Treatment of Intracranial Aneurysms: Ten Years of Lessons Learned and Adjustments in Practice from the WorldWideWEB Consortium. *Transl Stroke Res*. 2022 Sep 6. PMID: 36066701.
50. Adeeb N, Dibas M, Griessenauer CJ, Cuellar HH, Salem MM, Xiang S, Enriquez-Marulanda A, Hong T, Zhang H, Tausky P, Grandhi R, Waqas M, Aldine AS, Tutino VM, Aslan A, Siddiqui AH, Levy EI, Ogilvy CS, Thomas AJ, Ulfert C, Möhlenbruch MA, Renieri L, Bengzon Diestro JD, Lanzino G, Brinjikji W, Spears J, Vranic JE, Regenhardt RW, Rabinov JD, Harker P, Müller-Thies-Broussalis E, Killer-Oberpfalzer M, Islak C, Kocer N, Sonnberger M, Engelhorn T, Kapadia A, Yang VXD, Salehani A, Harrigan MR, Krings T, Matouk CC, Mirshahi S, Chen KS, Aziz-Sultan MA, Ghorbani M, Schirmer CM, Goren O, Dalal SS, Finkenzeller T, Holtmannspötter M, Buhk JH, Foreman PM, Cress MC, Hirschl RA, Reith W, Simgen A, Janssen H, Marotta TR, Stapleton CJ, Patel AB, Dmytriw AA. Learning Curve for Flow Diversion of Posterior Circulation Aneurysms: A Long-Term International Multicenter Cohort Study. *AJNR Am J Neuroradiol*. 2022 Nov PMID: 36229166.
51. Lai PMR**, Ryu JY, Park SC, Gross BA, Dickinson LD, Dagen S, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Blackburn S, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Frerichs KU, Niemela M, Ojemann SG, Patel NJ, Shi X, Valle-Giler EP, Wang AC, Welch BG, Zusman EE, Weiss ST, Du R. Somatic Variants in SVIL in Cerebral Aneurysms. *Neurol Genet*. 2022 Nov 28. PMID: 36475054
52. Ammar A**, Nawabi NLA, Hamzah R, Berger C, Jaweed M, Park KB, Rosseau G, Khan T, Monawari S, Pirzad AF, Aziz-Sultan MA. The Current State of Neurosurgery in Afghanistan. *World Neurosurg*. 2023 Jan PMID: 36270595.
53. El Naamani K, Mastorakos P, Adeeb N, Lan M, Castiglione J, Khanna O, Diestro JDB, McLellan RM, Dibas M, Vranic JE, Aslan A, Cuellar-Saenz HH, Guenego A, Carnevale J, Saliou G, Ulfert C, Möhlenbruch M, Foreman PM, Vachhani JA, Hafeez MU, Waqas M, Tutino VM, Rabinov JD, Ren Y, Michelozzi C, Spears J, Panni P, Griessenauer CJ, Asadi H, Regenhardt RW, Stapleton CJ, Ghozy S, Siddiqui A, Patel NJ, Kan P, Boddu S, Knopman J, Aziz-Sultan MA, Zanaty M, Ghosh R, Abbas R, Amllay A, Tjoumakaris SI, Gooch MR, Cancelliere NM, Herial NA, Rosenwasser RH, Zarzour H, Schmidt RF, Pereira VM, Patel AB, Jabbour P, Dmytriw AA; WorldWideWEB Consortium. Long-Term Follow-Up of Cerebral Aneurysms Completely Occluded at 6 Months After Intervention with the Woven EndoBridge (WEB) Device: a Retrospective Multicenter Observational Study. *Transl Stroke Res*. 2023 May 11. PMID: 37165289.
54. Fiorella D, Molyneux A, Coon A, Szikora I, Saatci I, Baltacioglu F, Aziz-Sultan MA, Hoit D, Delgado Almandoz JE, Eljovich L, Cekirge HS, Byrne J, Klisch J, Arthur AS. Safety and effectiveness of the Woven EndoBridge (WEB) system for the treatment of wide necked bifurcation aneurysms: final 5-year results of the pivotal WEB Intra-saccular Therapy study (WEB-IT). *J Neurointerv Surg*. 2023 Jun 24 PMID: 37355252.
55. 103. Gerstl JVE**, Blitz SE, Qu QR, Yearley AG, Lassarén P, Lindberg R, Gupta S, Kappel AD, Vicenty-Padilla JC, Gaude E, Atchaneeyasakul KC, Desai SM, Yavagal DR, Peruzzotti-Jametti L, Patel NJ, Aziz-Sultan MA, Du R, Smith TR, Bernstock JD. Global, Regional, and National Economic Consequences of Stroke. *Stroke*. 2023 Jul 27. PMID: 37497672
56. Zhang J, Ryu JY, Tirado SR, Dickinson LD, Abosch A, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Binyamin TR, Blackburn SL, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Folkerth RD, Frerichs KU, Howard BM, Jahromi BR, Niemela M, Ojemann SG, Patel NJ, Richardson RM, Shi X, Valle-Giler EP, Wang AC, Welch BG, Williams Z, Zusman EE, Weiss ST, Du R; GENIE Investigators. A Transcriptomic Comparative Study of Cranial Vasculature. *Transl Stroke Res*. 2023 Aug 23. PMID: 37612482.
58. Diestro JDB, Dibas M, Adeeb N, Regenhardt RW, Vranic JE, Guenego A, Lay SV, Renieri L, Balushi AA, Shotar E, Premat K, Namaani KE, Saliou G, Möhlenbruch MA, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Rai H, Tutino VM, Mirshahi S, Ghozy S, Harker P, Alotaibi NM, Rabinov JD, Ren Y, Schirmer CM, Goren O, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan AE, Salehani A, Nguyen A, Jones J, Psychogios M, Spears J, Marotta T, Pereira V, Parra-Fariñas C, Bres-Bullrich M, Mayich M, Salem MM, Burkhardt JK, Jankowitz BT, Domingo RA, Huynh T, Tawk R, Ulfert C, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Siddiqui A, Ducruet AF, Albuquerque FC, Patel N, Kan P, Kalousek V, Lylyk P, Boddu S, Stapleton CJ, Knopman J, Jabbour P, Tjoumakaris S, Clarençon F, Limbucci N, Aziz-Sultan MA, Cuellar-Saenz HH, Cognard C, Patel AB, Dmytriw AA. Stent-assisted Woven EndoBridge device for the treatment of intracranial aneurysms: an international multicenter study. *J Neurosurg*. 2023 Oct 20. PMID: 37862717.

59. Nguyen TN, Qureshi MM, Klein P, Yamagami H, Mikulik R, Etmnan N, Abdalkader M, Aziz-Sultan MA (204th of 274 authors) Global impact of the COVID-19 pandemic on subarachnoid haemorrhage hospitalisations, aneurysm treatment and in-hospital mortality: 1-year follow-up. *J Neurol Neurosurg Psychiatry*. 2022 Jul 28. PMID: 35902229.
60. 97. Dmytriw AA, Dibas M, Ghozy S, Adeeb N, Diestro JDB, Phan K, Cuellar-Saenz HH, Sweid A, Lay SV, Guenego A, Renieri L, Al Balushi A, Saliou G, Möhlenbruch M, Regenhardt RW, Vranic JE, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Sporns P, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Stapleton CJ, Siddiqui A, Ducruet AF, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Boddu S, Tjournakaris S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, Patel AB. The Woven EndoBridge (WEB) Device for the Treatment of Intracranial Aneurysms: Ten Years of Lessons Learned and Adjustments in Practice from the WorldWideWEB Consortium. *Transl Stroke Res*. 2022 Sep 6. PMID: 36066701.
61. Adeeb N, Dibas M, Griessenauer CJ, Cuellar HH, Salem MM, Xiang S, Enriquez-Marulanda A, Hong T, Zhang H, Taussky P, Grandhi R, Waqas M, Aldine AS, Tutino VM, Aslan A, Siddiqui AH, Levy EI, Ogilvy CS, Thomas AJ, Ulfert C, Möhlenbruch MA, Renieri L, Bengzon Diestro JD, Lanzino G, Brinjikji W, Spears J, Vranic JE, Regenhardt RW, Rabinov JD, Harker P, Müller-Thies-Broussalis E, Killer-Oberpfalzer M, Islak C, Kocer N, Sonnberger M, Engelhorn T, Kapadia A, Yang VXD, Salehani A, Harrigan MR, Krings T, Matouk CC, Mirshahi S, Chen KS, Aziz-Sultan MA, Ghorbani M, Schirmer CM, Goren O, Dalal SS, Finkenzeller T, Holtmannspötter M, Buhk JH, Foreman PM, Cress MC, Hirschl RA, Reith W, Simgen A, Janssen H, Marotta TR, Stapleton CJ, Patel AB, Dmytriw AA. Learning Curve for Flow Diversion of Posterior Circulation Aneurysms: A Long-Term International Multicenter Cohort Study. *AJNR Am J Neuroradiol*. 2022 Nov PMID: 36229166.
62. Lai PMR**, Ryu JY, Park SC, Gross BA, Dickinson LD, Dagen S, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Blackburn S, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Frerichs KU, Niemela M, Ojemann SG, Patel NJ, Shi X, Valle-Giler EP, Wang AC, Welch BG, Zusman EE, Weiss ST, Du R. Somatic Variants in SVIL in Cerebral Aneurysms. *Neurol Genet*. 2022 Nov 28. PMID: 36475054
63. Ammar A**, Nawabi NLA, Hamzah R, Berger C, Jaweed M, Park KB, Rosseau G, Khan T, Monawari S, Pirzad AF, Aziz-Sultan MA. The Current State of Neurosurgery in Afghanistan. *World Neurosurg*. 2023 Jan PMID: 36270595.
64. El Naamani K, Mastorakos P, Adeeb N, Lan M, Castiglione J, Khanna O, Diestro JDB, McLellan RM, Dibas M, Vranic JE, Aslan A, Cuellar-Saenz HH, Guenego A, Carnevale J, Saliou G, Ulfert C, Möhlenbruch M, Foreman PM, Vachhani JA, Hafeez MU, Waqas M, Tutino VM, Rabinov JD, Ren Y, Michelozzi C, Spears J, Panni P, Griessenauer CJ, Asadi H, Regenhardt RW, Stapleton CJ, Ghozy S, Siddiqui A, Patel NJ, Kan P, Boddu S, Knopman J, Aziz-Sultan MA, Zanaty M, Ghosh R, Abbas R, Amllay A, Tjournakaris SI, Gooch MR, Cancelliere NM, Herial NA, Rosenwasser RH, Zarzour H, Schmidt RF, Pereira VM, Patel AB, Jabbour P, Dmytriw AA; WorldWideWEB Consortium. Long-Term Follow-Up of Cerebral Aneurysms Completely Occluded at 6 Months After Intervention with the Woven EndoBridge (WEB) Device: a Retrospective Multicenter Observational Study. *Transl Stroke Res*. 2023 May 11. PMID: 37165289.
65. Fiorella D, Molyneux A, Coon A, Szikora I, Saatci I, Baltacioglu F, Aziz-Sultan MA, Hoit D, Delgado Almandoz JE, Eljovich L, Cekirge HS, Byrne J, Klisch J, Arthur AS. Safety and effectiveness of the Woven EndoBridge (WEB) system for the treatment of wide necked bifurcation aneurysms: final 5-year results of the pivotal WEB Intra-saccular Therapy study (WEB-IT). *J Neurointerv Surg*. 2023 Jun 24 PMID: 37355252.
66. Gerstl JVE**, Blitz SE, Qu QR, Yearley AG, Lassarén P, Lindberg R, Gupta S, Kappel AD, Vicenty-Padilla JC, Gaude E, Atchaneeyasakul KC, Desai SM, Yavagal DR, Peruzzotti-Jametti L, Patel NJ, Aziz-Sultan MA, Du R, Smith TR, Bernstock JD. Global, Regional, and National Economic Consequences of Stroke. *Stroke*. 2023 Jul 27. PMID: 37497672
67. Zhang J, Ryu JY, Tirado SR, Dickinson LD, Abosch A, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Binyamin TR, Blackburn SL, Chang EF, Chen PR, Colby GP, Cosgrove GR, David 46
68. CA, Day AL, Folkerth RD, Frerichs KU, Howard BM, Jahromi BR, Niemela M, Ojemann SG, Patel NJ, Richardson RM, Shi X, Valle-Giler EP, Wang AC, Welch BG, Williams Z, Zusman EE, Weiss ST, Du R; GENIE Investigators. A Transcriptomic Comparative Study of Cranial Vasculature. *Transl Stroke Res*. 2023 Aug 23. PMID: 37612482.
69. Diestro JDB, Dibas M, Adeeb N, Regenhardt RW, Vranic JE, Guenego A, Lay SV, Renieri L, Balushi AA, Shotar E, Premat K, Namaani KE, Saliou G, Möhlenbruch MA, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Rai H, Tutino VM, Mirshahi S, Ghozy S, Harker P, Alotaibi NM, Rabinov JD, Ren Y, Schirmer CM, Goren O, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan AE, Salehani A, Nguyen A, Jones J, Psychogios M, Spears J, Marotta T, Pereira V, Parra-Fariñas C, Bres-Bullrich M, Mayich M, Salem MM, Burkhardt JK, Jankowitz BT, Domingo RA, Huynh T, Tawk R, Ulfert C, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Siddiqui A, Ducruet AF, Albuquerque FC, Patel N, Kan P, Kalousek V, Lylyk P, Boddu S, Stapleton CJ, Knopman J, Jabbour P, Tjournakaris S, Clarençon F, Limbucci N, Aziz-Sultan MA, Cuellar-Saenz HH, Cognard C, Patel AB, Dmytriw AA. Stent-assisted Woven EndoBridge device for the treatment of intracranial aneurysms: an international multicenter study. *J Neurosurg*. 2023 Oct 20. PMID: 37862717.
70. Zhang X, Peng B, Zhang S, Wang J, Yuan X, Peled S, Chen W, Ding J, Li W, Zhang A, Wu Q, Stavrovskaya IG, Luo C, Sinha B, Tu Y, Yuan X, Li M, Liu S, Fu J, Aziz-Sultan A, Kristal BS, Alterovitz G, Du R, Zhou S, Wang X. The MT1 receptor as the target of ramelteon neuroprotection in ischemic stroke. *J Pineal Res*. 2024 Jan. PMID: 37986632.
71. Dmytriw AA, Musmar B, Salim H, Aslan A, Cancelliere NM, McLellan RM, Algin O, Ghozy S, Dibas M, Lay SV, Guenego A, Renieri L, Carnevale JA, Saliou G, Mastorakos P, El Naamani K, Shotar E, Premat K, Möhlenbruch MA, Kral M, Doron O, Chung C, Salem MM, Lylyk I, Foreman PM, Vachhani JA, Shaikh H, Župančić V, Hafeez MU, Catapano JS, Waqas M, Tutino VM, Ibrahim MK, Mohammed MA, Imamoglu C, Bayrak A, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kuhn AL, Michelozzi C, Elens S, Hasan Z, Starke RM, Hassan AE, Ogilvie M, Nguyen A, Jones J, Brinjikji W, Nawka MT, Psychogios MN, Ulfert C, Diestro JDB, Pukenas B, Burkhardt JK, Huynh TJ, Martinez-Gutierrez JC, Essibayi MA, Sheth SA, Spiegel G, Tawk R, Lubicz B, Panni P, Puri AS, Pero G, Nossek E, Raz E, Killer-Oberpfalzer M, Griessenauer CJ, Asadi H, Siddiqui AH, Brook AL, Altschul D, Ducruet AF, Albuquerque FC, Regenhardt RW, Stapleton CJ, Kan P, Kalousek V, Lylyk P, Boddu SR, Knopman J, Aziz-Sultan MA, Tjournakaris SI, Clarençon F, Limbucci N, Cuellar HH, Jabbour PM, Pereira VM, Patel AB, Adeeb N. The impact of postoperative aspirin in patients undergoing Woven EndoBridge: a multicenter, institutional, propensity score-matched analysis. *J Neurointerv Surg*. 2024 Jan 18. PMID: 38238006.
72. Kappel AD, Nguyen HB, Frerichs KU, Patel NJ, Aziz-Sultan MA, Du R. Randomized Clinical Trials in Cerebrovascular Neurosurgery From 2018 to 2022. *Cureus*. 2024 Jan 16; PMID: 38361699.
73. Dmytriw AA, Salim H, Musmar B, Aslan A, Cancelliere NM, McLellan RM, Algin O, Ghozy S, Dibas M, Lay SV, Guenego A, Renieri L, Carnevale J, Saliou G, Mastorakos P, Naamani KE, Shotar E, Premat K, Möhlenbruch M, Kral M, Doron O, Chung C, Salem MM, Lylyk I, Foreman PM, Vachhani JA, Shaikh H, Župančić V, Hafeez MU, Catapano J, Waqas M, Tutino VM, Ibrahim MK, Mohammed MA, Imamoglu C, Bayrak A, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan AE, Ogilvie M, Sporns P, Jones J, Brinjikji W,
74. Nawka MT, Psychogios M, Ulfert C, Diestro JDB, Pukenas B, Burkhardt JK, Huynh T, Martinez-Gutierrez JC, Essibayi MA, Sheth SA, Spiegel G, Tawk R, Lubicz B, Panni P, Puri AS, Pero G, Nossek E, Raz E, Killer-Oberfalzer M, Griessenauer CJ, Asadi H, Siddiqui A, Brook AL, Altschul D, Ducruet AF, Albuquerque FC, Regenhardt RW, Stapleton CJ, Kan P, Kalousek V, Lylyk P, Boddu S, Knopman J, Aziz-Sultan MA, Tjournakaris SI, Clarençon F, Limbucci N, Cuellar-Saenz HH, Jabbour PM, Pereira VM, Patel AB, Adeeb N. Dual Layer vs Single Layer Woven EndoBridge Device in the Treatment of Intracranial Aneurysms: A Propensity Score-Matched Analysis. *Neurosurg Rev*. 2024 Mar 14. PMID: 38483647.
75. Kappel AD, Jha R, Guggilapu S, Smith WJ, Feroze AH, Dmytriw AA, Vicenty-Padilla J, Alcedo Guardia RE, Gessler FA, Patel NJ, Du R, See AP, Peruzzi PP, Aziz-Sultan MA, Bernstock JD. Endovascular Applications for the Management of High-Grade Gliomas in the Modern Era. *Cancers (Basel)*. 2024 Apr 22. PMID: 38672676.

77. Diestro JDB, Adeeb N, Musmar B, Salim H, Aslan A, Cancelliere NM, McLellan RM, Algin O, Ghozy S, Lay SV, Guenego A, Renieri L, Carnevale J, Saliou G, Mastorakos P, El Naamani K, Shotar E, Premat K, Möhlenbruch M, Kral M, Bernstock JD, Doron O, Chung C, Salem MM, Lylyk I, Foreman PM, Vachhani JA, Shaikh H, Župančić V, Hafeez MU, Catapano J, Waqas M, Ibrahim MK, Mohammed MA, Imamoglu C, Bayrak A, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan AE, Ogilvie M, Nguyen A, Jones J, Brinjikji W, Nawka MT, Psychogios M, Ulfert C, Pukenas B, Burkhardt JK, Huynh T, Martinez-Gutierrez JC, Essibayi MA, Sheth SA, Spiegel G, Tawk RG, Lubicz B, Panni P, Puri AS, Pero G, Nossek E, Raz E, Killer-Oberpfalzer M, Griessenauer CJ, Asadi H, Siddiqui A, Brook AL, Altschul D, Spears J, Marotta TR, Ducruet AF, Albuquerque FC, Regenhardt RW, Stapleton CJ, Kan P, Kalousek V, Lylyk P, Boddu S, Knopman J, Aziz-Sultan MA, Tjoumakaris SI, Jabbour PM, Clarençon F, Limbucci N, Cuellar-Saenz HH, Mendes Pereira V, Patel AB, Dmytriw AA. Association of preprocedural antiplatelet use with decreased thromboembolic complications for intracranial aneurysms undergoing intrasaccular flow disruption. *J Neurosurg.* 2024 May 3. PMID: 38701528.

78. Tjoumakaris SI, Hanel R, Mocco J, Ali-Aziz Sultan M, Froehler M, Lieber BB, Coon A, Tateshima S, Altschul DJ, Narayanan S, El Naamani K, Taussky P, Hoh BL, Meyers P, Gounis MJ, Liebeskind DS, Volovici V, Toth G, Arthur A, Wakhloo AK; ARISE I Consortium. ARISE I Consensus Review on the Management of Intracranial Aneurysms. *Stroke.* 2024 May. PMID: 38648283.

79. Salim H, Musmar B, Adeeb N, Yedavalli V, Lakhani D, Grewal SS, El Naamani K, Henninger N, Sundararajan SH, Kühn AL, Khalife J, Ghozy S, Scarcia L, Tan BY, Regenhardt RW, Heit JJ, Cancelliere NM, Bernstock JD, Rouchaud A, Fiehler J, Sheth S, Puri AS, Dyzmann C, Colasurdo M, Barreau X, Renieri L, Filipe JP, Harker P, Radu RA, Abdalkader M, Klein P, Marotta TR, Spears J, Ota T, Mowla A, Jabbour P, Biswas A, Clarençon F, Siegler JE, Nguyen TN, Varela R, Baker A, Essibayi MA, Altschul D, Gonzalez NR, Möhlenbruch MA, Costalat V, Gory B, Stracke CP, Aziz-Sultan MA, Hecker C, Shaikh H, Liebeskind DS, Pedicelli A, Alexandre AM, Tancredi I, Faizy TD, Kalsoum E, Lubicz B, Patel AB, Pereira VM, Guenego A, Dmytriw AA; MAD MT Investigators. Outcomes of mechanical thrombectomy in anticoagulated patients with acute distal and medium vessel stroke. *Eur Stroke J.* 2024 May 10. PMID: 38726983.

80. Chen KS, Khawaja A, Xu E, Mekary RA, Vaitkevicius H, Aziz-Sultan A, Du R, Patel NJ. Changes in inpatient brain arteriovenous malformation management in the United States following the ARUBA trial: analysis of an interrupted time series design. *Clin Neurol Neurosurg.* 2024 Jul. PMID: 38728853.

81. Mastorakos P, Naamani KE, Adeeb N, Lan M, Castiglione J, Khanna O, Ghosh R, Bengzon Diestro JD, Dibas M, McLellan RM, Algin O, Ghozy S, Cancelliere NM, Aslan A, Cuellar-Saenz HH, Lay SV, Guenego A, Renieri L, Carnevale J, Saliou G, Shotar E, Premat K, Möhlenbruch M, Kral M, Vranic JE, Chung C, Salem MM, Lylyk I, Foreman PM, Vachhani JA, Shaikh H, Župančić V, Hafeez MU, Catapano J, Waqas M, Tutino VM, Ibrahim MK, Mohammed MA, Rabinov JD, Ren Y, Schirmer CM, Piano M, Bullrich MB, Mayich M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan AE, Ogilvie M, Nguyen A, Jones J, Brinjikji W, Psychogios M, Ulfert C, Spears J, Jankowitz BT, Burkhardt JK, Domingo RA, Huynh T, Tawk RG, Lubicz B, Nawka MT, Panni P, Puri AS, Pero G, Nossek E, Raz E, Killer-Oberpfalzer M, Ozates MO, Ayberk G, Regenhardt RW, Griessenauer CJ, Asadi H, Siddiqui A, Ducruet AF, Albuquerque FC, Patel NJ, Stapleton CJ, Kan P, Kalousek V, Lylyk P, Boddu S, Knopman J, Aziz-Sultan MA, Clarençon F, Limbucci N, Zanaty M, Martinez-Gutierrez JC, Sheth S, Spiegel G, Abbas R, Amllay A, Tjoumakaris SI, Gooch MR, Herial NA, Rosenwasser RH, Zarzour H, Schmidt RF, Pereira VM, Patel AB, Jabbour PM, Dmytriw AA. Predictors of Aneurysm Obliteration in Patients Treated with the WEB Device: Results of a Multicenter Retrospective Study. *AJNR Am J Neuroradiol.* 2024 Jul 8. PMID: 38977286.

82. Yedavalli VS, Salim HA, Musmar B, Adeeb N, Essibayi MA, ElNaamani K, Henninger N, Sundararajan SH, Kuhn AL, Khalife J, Ghozy S, Scarcia L, Tan BY, Heit JJ, Regenhardt RW, Cancelliere NM, Bernstock JD, Rouchaud A, Fiehler J, Sheth SA, Puri AS, Dyzmann C, Colasurdo M, Barreau X, Renieri L, Filipe JP, Harker P, Radu RA, Marotta TR, Spears J, Ota T, Mowla A, Jabbour P, Biswas A, Clarençon F, Siegler JE, Nguyen TN, Varela R, Baker A, Altschul D, Gonzalez N, Möhlenbruch MA, Costalat V, Gory B, Stracke P, Aziz-Sultan MA, Hecker C, Shaikh H, Liebeskind DS, Pedicelli A, Alexandre AM, Tancredi I, Faizy TD, Kalsoum E, Lubicz B, Patel AB, Mendes Pereira V, Guenego A, Dmytriw AA; MAD MT Investigators. Symptomatic intracerebral hemorrhage in proximal and distal medium middle cerebral artery occlusion patients treated with mechanical thrombectomy. *J Neurointerv Surg.* 2024 Jul 8. PMID: 38977305.



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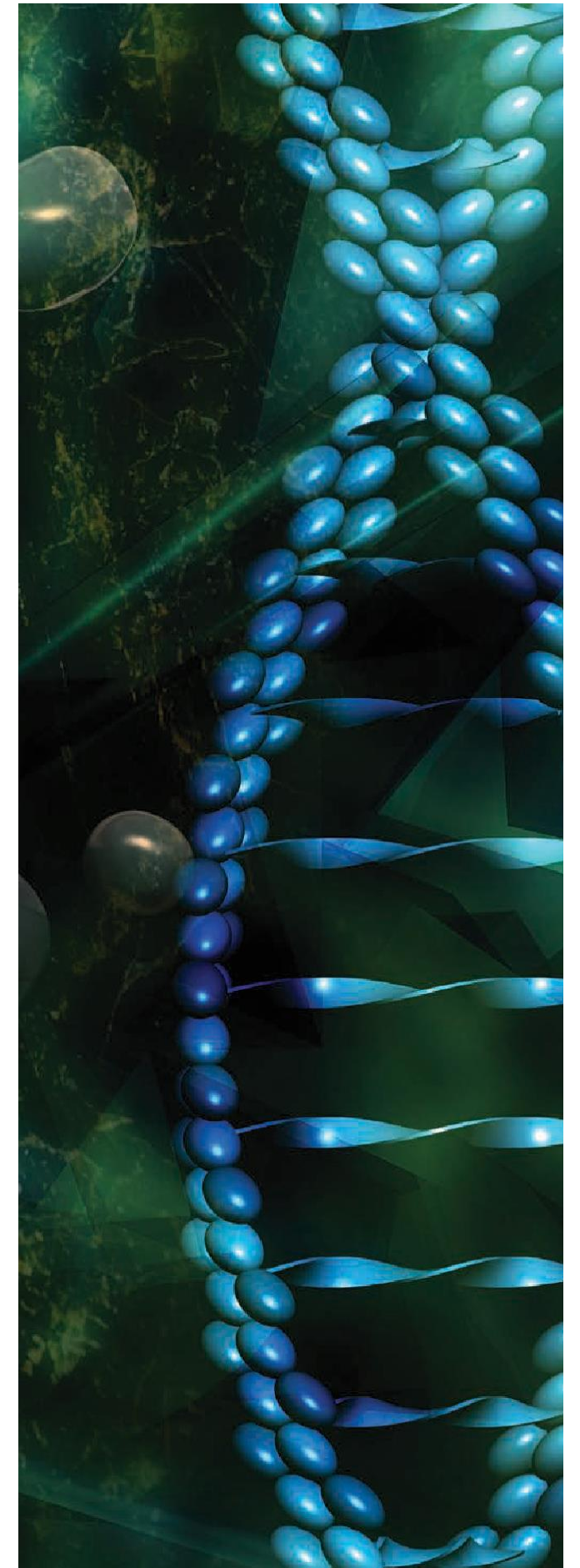
PUBLICATIONS

1. Chavakula V, Yan SC, Huang KT, Liu J, Bi WL, Rozman P, Chi JH. Subdural pneumocephalus aspiration reduces recurrence of chronic subdural hematoma. *Oper Neurosurg.* 2020. 18(4):391-397, MID: 31313813
2. Lamba N, Hwang WL, Kim DW, Niemierko A, Marciscano AE, Mehan WA Jr, Benayoun MD, Curry WT, Barker FG 2nd, Martuza RL, Dunn IF, Claus E, Bi WL, Aizer AA, Alexander BM, Oh KS, Loeffler JS, Shih HA. Atypical histopathological features and the risk of treatment failure in nonmalignant meningiomas: a multi-institutional analysis. *World Neurosurg.* 2020. 133:e804-e812. PMID: 31605839
3. Mooney MA, Bi WL, Cantalino JM, Wu KC, Harris TC, Possatti LL, Juvekar P, Hsu L, Dunn IF, Al-Mefty O[§], Devlin PM[§]. Surgical resection with brachytherapy as salvage treatment for recurrent high-grade meningiomas: a matched cohort study. *J Neurooncology.* 2020. PMID: 31745706
4. Leung LWL, Unadkat P, Bertotti MM, Bi WL, Essayed W, Bunevicius A, Chavakula V, Rigolo L, Fumagalli L, Tie Z, Golby AJ, Tie Y. Clinical utility of preoperative bilingual language fMRI mapping in patients with brain tumors. *J Neuroimaging.* 2020. 30(2):175-183. PMID: 32037662
5. Heaphy CM, Bi WL, Coy S, Davis C, Gallia GL, Santagata S, Rodriguez FJ. Telomere length alterations and ATRX/DAXX loss in pituitary adenomas. *Mod Pathol.* 2020. PMID: 32203094
6. Mooney MA, Abolfotoh M, Bi WL, Tavanaiepour D, Almefty RO, Bassiouni H, Pravdenkova S, Dunn IF, Al-Mefty O. Is falcine meningioma a diffuse disease of the falx? Case series and analysis of a "grade zero" resection. *Neurosurgery.* 2020. PMID: 32294205

7. Touat M, Li YY, Boynton AN, Spurr LF, Iorgulescu JB, Bohrsen CL, Cortes-Ciriano I, Birzu C, Geduldig JE, Pelton K, Lim-Fat MJ, Pal S, Ferrer-Luna R, Ramkissoon SH, Dubois F, Bellamy C, Currimjee N, Bonardi J, Qian K, Ho P, Malinowski S, Taquet L, Jones RE, Shetty A, Chow KH, Sharaf R, Pavlick D, Albacker LA, Younan N, Baldini C, Verreault M, Giry M, Guillem E, Ammari S, Beuvon F, Mokhtari K, Alentorn A, Dehais C, Houillier C, Laigle-Donadey F, Psimaras D, Lee EQ, Nayak L, McFaline-Figueroa JR, Carpentier A, Cornu P, Capelle L, Mathon B, Barnholtz-Sloan JS, Chakravarti A, Bi WL, Chiocca EA, Fehnel KP, Alexandrescu S, Chi SN, Haas-Kogan D, Batchelor TT, Frampton GM, Alexander BM, Huang RY, Ligon AH, Coulet F, Delattre JY, Hoang-Xuan K, Meredith DM, Santagata S, Duval A, Sanson M, Cherniack AD, Wen PY, Reardon DA, Marabelle A, Park PJ, Idubai A, Beroukhi R, Bandopadhyay P, Bielle F, Ligon KL. Mechanisms and therapeutic implications of hypermutation in gliomas. *Nature*. 2020. 580(7804):517-253. PMID: 32322066
8. Shi DD, Arnaout O, Bi WL, Buchbinder EI, Cagney DN, Insko ML, Liu D, Schoenfeld JD, Aizer AA. Severe radiation necrosis refractory to surgical resection in patients with melanoma and brain metastases managed with ipilimumab/nivolumab and brain-directed stereotactic radiation therapy. *World Neurosurg*. 2020. 139:226-231. PMID: 32330622
9. Fu Y, Liu CJ, Kobayashi DK, Johanns TM, Bowman-Kirigin J, Schaettler MO, Mao DD, Bender D, Kelley DG, Uppaluri R, Bi WL, Dunn IF, Tao Y, Luo J, Kim AH, Dunn GP. GATA2 regulates constitutive PD-L1 and PD-L2 expression in brain tumors. *Sci Rep*. 2020. 10(1):9027. PMID: 32493985
10. Hauser BM, Gupta S, Xu E, Wu K, Bernstock JD, Chua M, Khawaja AM, Smith TR, Dunn IF, Bergmark RW, Bi WL. Impact of insurance on hospital course and readmission after resection of benign meningioma. *J Neurooncol*. 149(1):131-140. 2020. PMID: 32654076
11. Abou-al-Shaar H, Cohen MA, Bi WL, Gozal YM, Alzhrani G, Karsy M, Al-Mefty O, Couldwell WT. Surgical management of multifocal trigeminal schwannomas. *Oper Neurosurg*. 2020. PMID: 32717071
12. Khalsa J, Cheng N, Keegan J, Bi WL, Lederer J, Shah K. Immune phenotyping of diverse syngeneic brain tumors identifies immunologically distinct types. *Nature Communications*. 2020. 11(1):3912. PMID: 32764562
13. Bi WL*, Gupta S*, Mei Y, Al Abdulmohsen S, Giantini Larsen A, Unadkat P, Ramkissoon S, Abedalthagafi M, Dunn IF. Immunophenotype of vestibular schwannomas. *Otol & Neurotol*. 2020. 41(10):e1290-e1296. PMID: 33492804
14. Wang F, Catalino M, Bi WL, Dunn IF, Smith TR, Guo Y, Hordejuk D, Kaiser UB, Laws E, Min L. Post-operative day one morning cortisol value as a biomarker to predict long-term remission of Cushing disease. *J Clin Endocrinol Metab*. 2020. 106(1):e94-e102. PMID: 33108450
15. Zaki M, Gupta S, Hauser BM, Wu KC, Mallery RM, Prasad S, Aizer AA, Bi WL[§], Dunn IF[§]. Bilateral occipital metastases: management considerations and visual deficits. *Surgical Neurology International*. 2020. 11:428. PMID: 33365190. [§]Co-corresponding author
16. Rahman S, McCarty JC, Gadkaree S, Semco RS, Bi WL, Dhand A, Jarman MP, Ortega G, Uribe-Leitz T, Bergmark RW. Disparities in the geographic distribution of neurosurgeons in the United States: a geospatial analysis. *World Neurosurg*. 2021. 151:e146-e155. PMID: 33831612
17. Yao S, Chen WL, Tavakol S, Akter F, Catalino MP, Guo XP, Zeng AL, Zekelman L, Song J, Mao ZG, Zhu YH, Wu QZ, Laws ER, Bi WL[§], Wang HJ. [§] Predictors of postoperative biochemical remission in acromegaly. *Journal of Neuro-Oncology*. 2021. 151(1):313-324. PMID 33394265. [§]Co-corresponding author
18. Mei Y*, Bi WL*[§], Agolia J, Hu C, Giantini Larsen A, Al Abdulmohsen S, Bale T, Agar NYR, Dunn GP, Abedalthagafi M, Dunn IF[§]. Immune profile of pituitary adenomas. *Pituitary*. 2021. PMID: 33492612. *Co-first and [§]Co-corresponding author
19. Frisken SF, Juvekar PR, Bi WL, Golby AJ. Mapping the progression of resection continuously during brain tumor surgery. Proceedings Volume 11598, Medical Imaging 2021: Image-guided procedures, robotic interventions, and modeling. SPIE Medical Imaging.
20. Bi WL, Nayak L, Meredith DM, Driver J, Du Z, Hoffman S, Li Y, Lee EQ, Beroukhi R, Rinne M, McFaline-Figueroa R, Chukwueke U, McCluskey C, Gaffey S, Cherniack AD, Stefanik J, Doherty L, Taubert C, Cifirino M, LaFrankie D, Graillon T, Wen PY, Ligon KL, Al-Mefty O, Huang RY, Muzikansky A, Chiocca EA, Santagata S, Dunn IF, Reardon DA. Activity of PD-1 blockade with Nivolumab among patients with recurrent atypical/anaplastic meningioma: Phase II trial results. *Neuro Oncol*. 2021. PMID: 34015129
21. Gupta S, Dawood H, Giantini Larsen A, Fandino L, Knelson EH, Smith TR, Lee EQ, Aizer A, Dunn IF, Bi WL. Surgical and peri-operative considerations for brain metastases. *Front Oncol*. 11:662943. PMID: 34026641
22. Bastos DCA, Juvekar P, Tie Y, Jowkar N, Pieper S, Wells WM, Bi WL, Golby A, Frisken S, Kapur T. Challenges and opportunities of intraoperative 3D ultrasound with neuronavigation in relation to intraoperative MRI. *Front Oncol*. 2021. 11:656519. PMID: 34026631
23. Zaki MM, Woodward E, Mashouf L, Langat P, Gupta S, Dunn IF, Wen P, Nahed BV, Bi WL. Genomic landscape of gliosarcoma: distinguishing features and targetable alterations. *Scientific Reports*. 2021. 11(1):18009. PMID: 34504233
24. Iuliano SL, Bi WL, Laws ER. Changes in the options for management of prolactin secreting pituitary adenomas. *J Neurol Surg B Skull Base*. 2021. 83(Suppl 2):e49-e53. PMID: 35832945
25. Driver J, Hoffman SE, Tavakol S, Woodward E, Maury EA, Greenwald NF, Nassiri F, Aldape K, Zadeh G, Choudhury A, Vasudevan HN, Magill ST, Raleigh DR, Abedalthagafi M, Aizer AA, Alexander BM, Ligon KL, Reardon DA, Wen PY, Al-Mefty O, Ligon AH, Dubuc AM, Beroukhi R, Claus EB, Dunn IF, Santagata S[§], Bi WL[§]. A molecularly integrated grade for meningioma. *Neuro-Oncology*. 2021. PMID: 34508644 [§]Co-corresponding author
26. Chiocca EA, Gelb AB, Chen CC, Rao G, Reardon DA, Wen PY, Bi WL, Peruzzi P, Amidei C, Triggs D, Sefton L, Park G, Grant J, Truman K, Buck JY, Hadar N, Demars N, Miao J, Estupinan T, Loewy J, Chadha K, Tringali J, Cooper L, Lukas RV. Combined immunotherapy with controlled Interleukin-12 gene therapy and immune checkpoint blockade in recurrent glioblastoma: an open-label, multi-institutional phase 1 trial. *NeuroOncology*. 2021. PMID: 34850166
27. Tavakol S, Catalino MP, Cote DJ, Boles X, Laws ER[§], Bi WL[§]. Cyst type differentiate Rathke cleft cysts from cystic pituitary adenomas. *Front Oncol*. 2021. 11:778824. PMID 34956896 [§]Co-corresponding author
28. Chiocca EA, Gelb AB, Chen CC, Rao G, Reardon DA, Wen PY, Bi WL, Peruzzi P, Amidei C, Triggs D, Sefton L, Park G, Grant J, Truman K, Buck JY, Hadar N, Demars N, Miao J, Estupinan T, Loewy J, Chadha K, Tringali J, Cooper L, Lukas RV. Combined immunotherapy with controlled Interleukin-12 gene therapy and immune checkpoint blockade in recurrent glioblastoma: an open-label, multi-institutional phase 1 trial. *NeuroOncology*. 2021. PMID 34850166.
29. Lim-Fat MJ, Youssef GC, Touat M, Iorgulescu JB, Whorral S, Allen M, Rahman R, Chukwueke U, McFaline-Figueroa JR, Nayak L, Lee EQ, Batchelor TT, Arnaout O, Peruzzi PP, Chiocca EA, Reardon DA, Meredith D, Santagata S, Beroukhi R, Bi WL, Ligon KL, Wen PY. Clinical utility of targeted next-generation sequencing assay in IDH-wildtype glioblastoma for therapy decision-making. *NeuroOncology*. 2022. 24(7):1140-1149. PMID 34878541.
30. Abunimer AM, Lak AM, Calvachi P, Smith TR, Aglio LS, Almefty KK, Dunn IF, Bi WL, Goldhaber SZ, Al-Mefty O. Early detection and management of venous thrombosis in skull base surgery: role of routine Doppler ultrasound monitoring. *Neurosurgery*. 2022. 91(1):115-122. PMID: 35383697
31. Lamba N, Catalano PJ, Bi WL, Wen PY, Haas-Kogan DA, Cagney DN, Aizer AA. Predictors of long-term survival among patients with brain metastases. *NeuroOncology*. 2022. 24(2):494-496. PMID: 34984469
32. Jain B, Dee EC, Jain U, Aizer A, Bi WL, Haas-Kogan D, Rahman R. Trends in location of death for individuals with primary brain tumors in the United States. *NeuroOncology*. 2022. 24(8):1400-1401. PMID: 35472173
33. Wang AY, Sharma V, Bi WL, Curry WT, Florman JE, Groff MW, Heilman CB, Hong J, Kryzanski J, Lollis SS, McGillicuddy GT, Moliterno J, Ogilvy CS, Oh DS, Oyelese AA, Proctor MR, Shear PA, Wakefield AE, Whitmore RG, Riesenburger RI. The New England Neurosurgical Society: growth and evolution over 70 years. *J Neurosurg*. 2022. 138(1):261-269. PMID: 3523259
34. Wu KC*, Cantalino J*, Dee EC, Hsu L, Harris T, Rawal B, Mooney M, Dunn IF, Aizer AA, Devlin PM[§], Bi WL[§]. Salvage brachytherapy for metastatic brain tumors: a matched-case analysis demonstrates improved local control in multiply recurrent brain metastases. *NeuroOncology Advances*. 2022. 4(1):vdac039. PMID: 35571989
35. Bhere D, Choi SH, van de Donk P, Hope D, Gortzak K, Kunnummal A, Khalsa J, Lechtich ER, Reinshagen C, Hissar H, Bi WL, Feng C, Zhang S, Ling H, Vasdev N, Ibn Essayed W, Golby A, Banouni N, Palagina A, Abdi R, Fury B, Smirnakis S, Lowe A, Reeve B, Hiller A, Chiocca EA, Prestwich G, Wakimoto H, Bauer G, Shah K. Target receptor identification and subsequent treatment of resected brain tumors with encapsulated and engineered allogeneic stem cells. *Nature Communications*. 2022. 13(1):2810. PMID 35589724
36. St Pierre R, Collings CK, Same Guerra DD, Widmer CJ, Bolonduro O, Mashtalir N, Sankar A, Liang Y, Bi WL, Gerkes EH, Ramesh V, Qi J, Smith MJ, Meredith DM, Kadoch C. Cancer-specific deficiency of SMARCE1, a module-linking BAF complex unit, generates a targetable dependency in clear cell meningioma. *Nature Genetics*. 2022. 54(6):861-873. PMID: 35681054.

37. Biermann J, Melms JC, Amin AD, Wang Y, Caprio LA, Karz A, Tagore S, Barrera I, Ibarra-Arellano MA, Andreatta M, Fullerton BT, Gretarsson KH, Sahu V, Mangipudy VS, Nguyen TTT, Nair A, Rogava M, Ho P, Koch PD, Banu M, Humala N, Mahajan A, Walsh ZH, Shah SB, Vaccaro DH, Caldwell B, Mu M, Wünnemann F, Chazotte M, Berhe S, Luoma AM, Driver J, Ingham M, Khan SA, Rapisuwon S, Slingluff CL Jr, Eigentler T, Röcken M, Carvajal R, Atkins MB, Davies MA, Agustinus A, Bakhoun SF, Azizi E, Siegelin M, Lu C, Carmona SJ, Hibshoosh H, Ribas A, Canoll P, Bruce JN, Bi WL, Agrawal P, Schapiro D, Hernando E, Macosko EZ, Chen F, Schwartz GK, Izar B. Dissecting the treatment-naïve ecosystem of human melanoma brain metastasis. *Cell*. 2022. 185(14):2591-2608. PMID: 35803246
38. Almefty KK, Mooney MA, Al-Mefty O, Essayed W, Bi WL, Cai L, Kadri PAS. Intracranial facial schwannomas: multiple distinct entities necessitating tailored management. *World Neurosurg*. 2022. 168:e187-195. PMID: 36150600
39. Choudhury A, Chen WC, Lucas CG, Bayley JC, Harmanci AS, Maas SLN, Santagata S, Klisch T, Perry A, Bi WL, Sahm F, Patel A, Magill ST, Raleigh DR. Hypermitotic meningiomas harbor DNA methylation subgroups with distinct biological and clinical features. *NeuroOncology*. 2023. 25(3):520-530. PMID: 36227281
40. Yeo KK*, Alexandrescu S*, Cotter JA*, Vogelzang J, Bhavé V, Li MM, Benhamida JK, Rosenblum MK, Bouvier N, Kavena K, Rosenberg T, Lim Fat MJ, Ghosh H, Martinez M, Aguilera D, Smith A, Goldman S, Diamond EL, Gavrilovic I, MacDonald TJ, Wood MD, Nazemi KJ, Truong A, Cluster A, Ligon KL, Cole K, Bi WL, Margol A, Karajannis MA, Wright KD. Multi-institutional study of the incidence, genomic landscape and outcome of pediatric IDH-mutant glioma. *NeuroOncology*. 2023. 25(1):199-210. PMID: 35604410
41. Patel RV, Yao S, Huang RY, Bi WL. Application of radiomics to meningiomas: a systemic review. *NeuroOncology*. 2023. PMID: 36723606
42. Segar DJ, Bernstock JD, Arnaout O, Bi WL, Friedman GK, Langer R, Traverso G, Rampersad SM. Modeling of intracranial tumor treating fields for the treatment of complex high-grade gliomas. *Scientific Reports*. 2023. 13(1):1636. PMID 36717682.
43. Juvekar P, Torio E, Bi WL, Chaves de Almeida Bastos D, Golby AJ, Frisken SF. Mapping resection progress by tool-tip tracking during brain tumor surgery for real-time estimation of residual tumor. *Cancers*. 2023. 15(3):825. PMID: 36765783
44. Schreck K*, Langat P*, Bhavé VM, Li T, Woodward E, Pratalis CA, Eberhart CG, Bi WL. Integrated molecular and clinical analysis of BRAF-mutant glioma in adults. *npj Precision Oncology*. 2023. 7(1):23. PMID: 36854806
45. Tobochnik S, Dorotan MKC, Ghosh HS, Lapinskas E, Vogelzang J, Reardon DA, Ligon KL, Bi WL, Smirnakis SM, Lee JW. Glioma genetic profiles associated with electrophysiologic hyperexcitability. *NeuroOncology*. 2024. 26(2):323-334. PMID: 37713468
46. Bhavé VM, Lamba N, Aizer AA, Bi WL. Minimizing intracranial disease prior to stereotactic radiation in single or solitary brain metastases. *Neurosurgery*. 2023. 93(4):782-793. PMID: 37036442
47. Bhavé VM, Lamba N, Tjong MC, Aizer AA, Bi WL. Reduced mortality and radiation necrosis after surgery with postoperative stereotactic radiation in patients with multiple brain metastases. *Neurosurgery*. 2024. 94(1):117-128. PMID: 37489905
48. Tsitsikov EN, Hameed S, Tavakol SA, Stephens TM, Tsytsykova AV, Garman L, Bi WL, Dunn IF. Specific gene expression signatures of low grade meningiomas. *Frontiers in Oncology*. 2023. 13:1126550. PMID: 36937440
49. Youssef G, Rahman R, Bay C, Wang W, Lim-Fat MJ, Arnaout O, Bi WL, Cagney DN, Chang YS, Cloughesy TF, DeSalvo M, Ellingson BM, Flood TF, Gerstner ER, Gonzalez-Castro LN, Guenette JP, Kim AE, Lee EQ, McFaline-Figueroa JR, Potter CA, Reardon DA, Huang RY, Wen PY. Evaluation of standard response assessment in neuro-oncology, modified response assessment in neuro-oncology, and immunotherapy response assessment in neuro-oncology in newly diagnosed and recurrent glioblastoma. *J Clin Oncol*. 2023. PMID: 37027809
50. Rizzo SM, Tavakol S, Bi WL, Li S, Secemsky EA, Campia U, Piazza G, Goldhaber SZ, Schmaier AA. Meningioma resection and venous thromboembolism incidence, management, and outcomes. *Res Pract Thromb Haemost*. 2023. 7(2):100121. PMID: 37063769
51. Stopka SA, Ruiz D, Baquer G, Bodineau C, Hossain MA, Pellens VT, Regan MS, Pourquie O, Haigis MC, Bi WL, Coy SM, Santagata S, Agar NYR, Basu SS. Chemical QuantArray: A quantitative tool for mass spectrometry imaging. *Anal Chem*. 2023. PMID: 37469028
52. Tong L, Medeiros L, Moen EL, Dhand A, Bi WL. Dissecting drivers and inefficiencies of inter-hospital transfers among patients with brain metastases. *Journal of Neurosurgery*. 2023. 140(1):27-37. PMID: 37486906
53. Cello G, Patel RV, McMahon JT, Santagata S, Bi WL. Impact of H3K27 trimethylation loss in meningiomas: a meta-analysis. *Acta Neuropathol Commun*. 2023. 11(1):122. PMID: 37491289
54. Deng D, Hammoudeh L, Youssef G, Chen YH, Lim-Fat MJ, McFaline-Figueroa JR, Chukwueke UN, Tanguturi S, Reardon DA, Lee EQ, Nayak L, Bi WL, Arnaout O, Ligon KL, Wen PY, Rahman R. Evaluating hematologic parameters in newly diagnosed and recurrent glioblastoma: prognostic utility and clinical trial implications of myelosuppression. *Neuro-Oncology Advances*. 2023.
55. Haberberger JF, Pegram W, Britt N, Schiavone K, Severson E, Sharaf R, Albacker LA, Williams E, Lechpammer M, Hemmerich A, Lin D, Huang RSP, Hiemenz M, Elvin J, Graf R, Lesser G, Kram D, Strowd R, Bi WL, Ramkissoon LA, Cohen MB, Reddy P, Creeden J, Ross JS, Alexander BM, Ramkissoon SH. A retrospective genomic landscape of 661 young adult glioblastomas diagnosed using 2016 WHO guidelines for central nervous system tumors. *Oncologist*. 2024. 29(1):e47-58. PMID: 37619245
56. Rahman R, Trippa L, Lee EQ, Arrillaga Romany I, Fell G, Touat M, McCluskey C, Wiley J, Gaffey S, Drappatz J, Welch MR, Galanis E, Ahluwalia MS, Colman H, Nabors LB, Hepel J, Elinzano H, Schiff D, Chukwueke UN, Beroukhim R, Nayak L, McFaline-Figueroa JR, Batchelor T, Rinne ML, Kaley TJ, Lu-Emerson C, Mellingshoff IK, Bi WL, Arnaout O, Peruzzi PP, Haas-Kogan D, Tanguturi S, Cagney D, Aizer AA, Doherty L, Lavalley M, Fisher-Longden B, Dowling S, Geduldig J, Watkinson F, Pisano W, Malinowski S, Ramkissoon S, Santagata S, Meredith DM, Chiocci EA, Reardon DA, Alexander BM, Ligon KL, Wen PY. Inaugural results of the Individualized Screening Trial of Innovative Glioblastoma Therapy: a phase II platform trial for newly diagnosed glioblastoma using Bayesian adaptive randomization. *J Clin Oncol*. 2023. 41(36):5524-5535. PMID: 37722087
57. Driver J, Santagata S, Bi WL, Chi JH. Genomic analysis of spinal meningiomas: correlation with histopathological grade. *J Neurosurg Spine*. 2023. PMID: 37728381
58. Ghosh HS*, Patel RV*, Woodward E, Greenwald N, Bhavé VM, Maury EA, Cello G, Hoffman SE, Li Y, Gupta H, Spurr LF, Vogelzang J, Touat M, Dubois F, Cherniack AD, Guo X, Tavakol S, Cioffi G, Lindeman NI, Ligon AH, Chiocci EA, Reardon DA, Wen PY, Meredith D, Santagata S, Barnholtz-Sloan JS, Ligon KL, Beroukhim R, Bi WL. Molecular landscape and contemporary prognostic signatures of gliomas. *medRxiv*. 2023 Sept.
59. Juvekar P, Dorent R, Kögl F, Torio E, Barr C, Rigolo L, Galvin C, Jowkar N, Kazi A, Haouchine N, Cheema H, Navab N, Pieper S, Wells WM, Bi WL, Golby A, Frisken S, Kapur T. ReMIND: the brain resection multimodal imaging database. *Scientific Data*. 2024. doi: 10.1101/2023.09.14.23295596. PMID: 37745329
60. Ling AL, Solomon IH, Landivar AM, Nakashima H, Woods JK, Santos A, Masud N, Fell G, Mo X, Yilmaz AS, Grant J, Zhang A, Bernstock JD, Torio E, Ito H, Liu J, Shono N, Nowicki MO, Triggs D, Halloran P, Piranlioglu R, Soni H, Stopa B, Bi WL, Peruzzi P, Chen E, Malinowski SW, Prabhu MC, Zeng Y, Carlisle A, Rodig SJ, Wen PY, Lee EQ, Nayak L, Chukwueke U, Gonzalez Castro LN, Dumont SD, Batchelor T, Kittelberger K, Tikhonova E, Mihecheva N, Tabakov D, Shin N, Gorbacheva A, Shumskiy A, Frenkel F, Aguilar-Cordova E, Aguilar LK, Krisky D, Wechuck J, Manzanera A, Matheny C, Tak PP, Barone F, Kovarsky D, Tirosh I, Suvà ML, Wucherpennig KW, Ligon K, Reardon DA, Chiocci EA. Clinical trial links oncolytic immunoactivation to survival in glioblastoma. *Nature*. 2023. 623(7985):157-166. PMID: 37853118
61. Carlson ML, Lohse CM, Agazzi S, Babu SC, Barker FG, Barnett S, Bi WL, Biggs N, Boahene KD, Breen JT, Brown KD, Cayé-Thomasen P, Cosetti MK, Deep NL, Dey JK, Dornhoffer JR, Forner D, Gurgel RK, Hansen MR, Hunter JB, Kalamirides M, Kim IA, King AT, Kircher ML, Lassaletta L, Link MJ, Lloyd SKW, Lund-Johansen M, Marinelli JP, Matthies C, Mehta V, Moore EJ, Nassiri AM, Neff BA, Nelson RF, Olson JJ, Patel NS, Celda MP, Plitt AR, Price DL, Thomas Roland J Jr, Sweeney AD, Tasche KK, Tatagiba M, Tveiten Ø, Van Gompel JJ, Vrabec JT, Wanna GB, Weisskopf PA. Rationale for the development of a novel clinical grading scale for postoperative facial nerve function: results of a multidisciplinary international working group. *Otol Neurotol*. 2023. PMID: 37875014

62. Carlson ML, Lohse CM, Agazzi S, Babu SC, Barker FG, Barnett S, Bi WL, Biggs N, Boahene KD, Breen JT, Brown KD, Cayé-Thomasen P, Cosetti MK, Deep NL, Dey JK, Dornhoffer JR, Forner D, Gurgel RK, Hansen MR, Hunter JB, Kalamarides M, Kim IA, King AT, Kircher ML, Lassaletta L, Link MJ, Lloyd SKW, Lund-Johansen M, Marinelli JP, Matthies C, Mehta V, Moore EJ, Nassiri AM, Neff BA, Nelson RF, Olson JJ, Patel NS, Celda MP, Plitt AR, Price DL, Thomas Roland J Jr, Sweeney AD, Tasche KK, Tatagiba M, Tveiten Ø, Van Gompel JJ, Vrabec JT, Wanna GB, Weisskopf PA. Rationale for the development of a novel clinical grading scale for postoperative facial nerve function: results of a multidisciplinary international working group. *Otol Neurotol*. 2023. PMID: 37875014
63. Chen WC, Choudhury A, Youngblood MW, Polley MC, Lucas CG, Mirchia K, Maas SLN, Suwala AK, Won M, Bayley JC, Harmanci AS, Harmanci A, Klisch TJ, Nguyen MP, Vasudevan HN, McCortney K, Yu TJ, Bhav V, Lam TC, Pu JK, Li LF, Leung GK, Chan JW, Perlow HK, Palmer JD, Haberler C, Berghoff AS, Preusser M, Nicolaidis TP, Mawrin C, Agnihotri S, Resnick A, Rood BR, Chew J, Young JS, Boreta L, Braunstein SE, Schulte J, Butowski N, Santagata S, Spetzler D, Bush NAO, Villanueva-Meyer JE, Chandler JP, Solomon DA, Rogers CL, Pugh SL, Mehta MP, Sneed PK, Berger MS, Horbinski CM, McDermott MW, Perry A, Bi WL, Patel AJ, Sahm F, Magill ST, Raleigh DR. Targeted gene expression profiling predicts meningioma outcomes and radiotherapy responses. *Nature Med*. 2023. 29(12):3067-3076. PMID: 37944590
64. Banko L, Patel RV, Nawabi N, Altshuler M, Medeiros L, Cosgrove GR, Bi WL. Strategies to improve surgical technical competency: a systematic review. *Acta Neurochir*. 2023. 165(12):3565-3572. PMID: 37945995
65. Wu KC, Freedman BR, Kwon PS, Torre M, Kent DO, Bi WL, Mooney DJ. A tough bioadhesive hydrogel supports sutureless sealing of the dural membrane in porcine and ex vivo human tissues. *Sci Transl Med*. 2024. 16(739):eadj0616. PMID: 38507468
66. Wu K, Guenette J, Huang RY, Al-Mefty O, Dunn IF, Bi WL. Improved optic nerve visualization and surgical planning through a novel MRI protocol. *Neurosurgery Focus*. 2024. 56(4):E9. PMID:38560937
67. Lim-Fat MJ, Iorgulescu JB, Rahman R, Bhav V, Muzikansky A, Woodward E, Whorral S, Allen M, Touat M, Li X, Xy G, Patel J, Gerstner ER, Kalpathy-Cramer J, Youssef G, Chukwueke U, McFaline-Figueroa JR, Nayak L, Lee EQ, Reardon DA, Beroukhim R, Huang RY, Bi WL, Ligon KL, Wen PY. Clinical and genomic predictors of adverse events in newly diagnosed glioblastoma. *Clin Cancer Res*. 2024. 30(7):1327-1337. PMID: 38252427
68. Tan Y*, Patel RV*, Wang Z, Luo Y, Chen J, Luo J, Chen W, Mao Z, Huang RY, Wang H, Bi WL, Yao S. Generation and applications of synthetic computed tomography images for neurosurgical planning. *J Neurosurg*. 2024. 141(3):742-751. PMID: 38579358
69. Li S, Zhang W, Yao S, He J, Zhu C, Gao J, Xue T, Xie G, Chen Y, Torio EF, Feng Y, Bastos DC, Rathi Y, Makris N, Kikinis R, Bi WL, Golby AJ, O'Donnell LJ, Zhang F. Tractography-based automatic identification of the retinogeniculate visual pathway with novel microstructure-informed supervised contrastive learning. *bioRxiv*. 2024. PMID: 38260369
70. Tobochnik S, Regan MS, Dorotan MKC, Reich D, Lapinskas E, Hossain MA, Stopka SA, Santagata S, Murphy MM, Arnaout O, Bi WL, Chiocca EA, Golby AJ, Mooney MA, Smith TR, Ligon KL, Wen PY, Agar NYR, Lee JW. Pilot trial of perampanel on peritumoral hyperexcitability and clinical outcomes in newly diagnosed high-grade glioma. *medRxiv*. 2024. PMID: 38645003
71. Lim-Fat MJ, Cotter JA, Touat M, Vogelzang J, Sousa C, Pisano W, Geduldig J, Bhav V, Driver J, Kao PC, McGovern A, Ma C, Margol AS, Cole K, Smith A, Goldman S, Kaneva K, Truong AL, Nazemi KJ, Wood MD, Wright KD, London WB, Warren KE, Wen PY, Bi WL, Alexandrescu S, Reardon DA, Ligon KL, Yeo KK. A comparative analysis of IDH-mutant glioma in pediatric, young adult, and older adult patients. *Neuro Oncol*. 2024. PMID: 39082676
72. Patel RV, Tong L, Molyneaux BJ, Patel NJ, Aziz-Sultan MA, Dhand A, Bi WL. Interhospital transfer dynamics for patients with intracranial hemorrhage in Massachusetts. *Frontiers Neurology*. Jul 2024. PMID: 39144707
73. Ghosh HS*, Patel RV*, Woodward E, Greenwald NF, Bhav VM, Maury EA, Cello G, Hoffman SE, Li Y, Gupta H, Youssef G, Spurr LF, Vogelzang J, Touat M, Dubois F, Cherniack AD, Guo X, Tavakol S, Cioffi G, Lindeman NI, Ligon AH, Chiocca EA, Reardon DA, Wen PY, Meredith D, Santagata S, Barnholtz-Sloan JS, Ligon KL, Beroukhim R, Bi WL. Contemporary prognostic signatures and refined risk stratification of gliomas: an analysis of 4,400 tumors. *Neuro Oncol*. 2024. PMID: 39164213
74. Patel RV*, Yao S*, Aguilar Murillo E, Huang RY, Bi WL. Spatial distribution of meningiomas: a magnetic resonance image atlas. *Neurosurgery*. 2024. PMID: 39194267
75. Patel RV, Ghosh HS, Meredith D, Ryall S, Claus EB, Beroukhim R, Ligon AH, Santagata S, Bi WL. Distribution of copy number alterations and impact of chromosome arm call thresholds for meningioma. *Nature Communications*. 2024. [Accepted]





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PUBLICATIONS

1. Schoenfeld AJ, Schwab JH, Ferrone ML, Blucher JA, Balboni TA, Barton LB, Chi JH, Kang JD, Losina E, Katz JN. Non-operative management of spinal metastases: A prognostic model for failure. *Clin Neurol Neurosurg*. 2020 Jan;188:105574. doi: 10.1016/j.clineuro.2019.105574. Epub 2019 Nov 4. PMID: 31707291; PMCID: PMC6949394.
2. Chavakula V, Chi JH. In Reply: Subdural Pneumocephalus Aspiration Reduces Recurrence of Chronic Subdural Hematoma. *Oper Neurosurg (Hagerstown)*. 2020 Feb 1;18(2). doi: 10.1093/ons/ops366. PMID: 31848604.
3. Liu J, Kurepa D, Feletti F, Alonso-Ojembarrena A, Lovrenski J, Copetti R, Sorantin E, Rodriguez-Fanjul J, Katti K, Aliverti A, Zhang H, Hwang M, Yeh TF, Hu CB, Feng X, Qiu RX, Chi JH, Shang LL, Lyu GR, He SZ, Chai YF, Qiu ZJ, Cao HY, Gao YQ, Ren XL, Guo G, Zhang L, Liu Y, Fu W, Lu ZL, Li HL. International Expert Consensus and Recommendations for Neonatal Pneumothorax Ultrasound Diagnosis and Ultrasound-guided Thoracentesis Procedure. *J Vis Exp*. 2020 Mar 12;(157). doi: 10.3791/60836. PMID: 32225145.
4. Chavakula V, Yan SC, Huang KT, Liu J, Bi WL, Rozman P, Chi JH. Subdural Pneumocephalus Aspiration Reduces Recurrence of Chronic Subdural Hematoma. *Oper Neurosurg (Hagerstown)*. 2020 Apr 1;18(4):391-397. doi: 10.1093/ons/ops193. PMID: 31313813.
5. Schoenfeld AJ, Blucher JA, Barton LB, Schwab JH, Balboni TA, Chi JH, Shin JH, Kang JD, Harris MB, Ferrone ML. Design of the prospective observational study of spinal metastasis treatment (POST). *Spine J*. 2020 Apr;20(4):572-579. doi: 10.1016/j.spinee.2019.10.021. Epub 2019 Nov 8. PMID: 31712164.
6. Gupta S, Hauser BM, Zaki MM, Xu E, Cote DJ, Lu Y, Chi JH, Groff M, Khawaja AM, Harris MB, Smith TR, Zaidi HA. Morbidity after traumatic spinal injury in pediatric and adolescent sports-related trauma. *J Neurosurg Spine*. 2019 Dec 27;32(5):642-648. doi: 10.3171/2019.10.SPINE19712. PMID: 31881536; PMCID: PMC7383358.
7. Moses ZB, Lee TC, Huang KT, Guenette JP, Chi JH. MRI-guided cryoablation for metastatic spine disease: intermediate-term clinical outcomes in 14 consecutive patients. *J Neurosurg Spine*. 2020 Jan 17;32(5):676-681. doi: 10.3171/2019.11.SPINE19808. PMID: 31952035.
8. Huynh MA, Roldan C, Nunes P, Kelly A, Taylor A, Richards C, Fareed MM, Gorman D, Groff M, Ferrone M, Lu Y, Chi JH, Spektor A, Balboni T. Characteristics of Patients and Treatment Recommendations from a Multidisciplinary Spinal Tumor Program. *Palliat Med Rep*. 2020 Jul 31;1(1):143-148. doi: 10.1089/pmr.2020.0070. PMID: 34223468; PMCID: PMC8241365.
9. Lak AM, Rahimi A, Abunimer AM, Tafel I, Devi S, Premkumar A, Ida F, Lu Y, Chi JH, Tanguturi S, Groff MW, Zaidi HA. Quantifying the impact of surgical decompression on quality of life and identification of factors associated with outcomes in patients with symptomatic metastatic spinal cord compression. *J Neurosurg Spine*. 2020 Apr 3;33(2):237-244. doi: 10.3171/2020.1.SPINE191326. PMID: 32244218.
10. Cheng DC, Chi JH, Yang SN, Liu SH. Organ Contouring for Lung Cancer Patients with a Seed Generation Scheme and Random Walks. *Sensors (Basel)*. 2020 Aug 26;20(17):4823. doi: 10.3390/s20174823. PMID: 32858982; PMCID: PMC7506591.
11. Lee TC, Guenette JP, Moses ZB, Lee JW, Annino DJ, Chi JH. MRI and CT Guided Cryoablation for Intracranial Extension of Malignancies along the Trigeminal Nerve. *J Neurol Surg B Skull Base*. 2020 Oct;81(5):511-514. doi: 10.1055/s-0039-1692640. Epub 2019 Jun 12. PMID: 33134018; PMCID: PMC7591355.
12. Gao Y, Cai GY, Fang W, Li HY, Wang SY, Chen L, Yu Y, Liu D, Xu S, Cui PF, Zeng SQ, Feng XX, Yu RD, Wang Y, Yuan Y, Jiao XF, Chi JH, Liu JH, Li RY, Zheng X, Song CY, Jin N, Gong WJ, Liu XY, Huang L, Tian X, Li L, Xing H, Ma D, Li CR, Ye F, Gao QL. Machine learning based early warning system enables accurate mortality risk prediction for COVID-19. *Nat Commun*. 2020 Oct 6;11(1):5033. doi: 10.1038/s41467-020-18684-2. PMID: 33024092; PMCID: PMC7538910.
13. Susano MJ, Grasfield RH, Friese M, Rosner B, Crosby G, Bader AM, Kang JD, Smith TR, Lu Y, Groff MW, Chi JH, Grodstein F, Culley DJ. Brief Preoperative Screening for Frailty and Cognitive Impairment Predicts Delirium after Spine Surgery. *Anesthesiology*. 2020 Dec 1;133(6):1184-1191. doi: 10.1097/ALN.0000000000003523. PMID: 32898243; PMCID: PMC7657972.
14. Schoenfeld AJ, Ferrone ML, Schwab JH, Blucher JA, Barton LB, Tobert DG, Chi JH, Shin JH, Kang JD, Harris MB. Prospective validation of a clinical prediction score for survival in patients with spinal metastases: the New England Spinal Metastasis Score. *Spine J*. 2021 Jan;21(1):28-36. doi: 10.1016/j.spinee.2020.02.009. Epub 2020 Feb 19. PMID: 32087387.
15. Driver J, Huang KT, Krag M, Bydon M, Nunley P, Lavoie S, Lu Y, Stone M, Chi JH. One Year Outcomes From a Prospective Multicenter Investigation Device Trial of a Novel Conformal Mesh Interbody Fusion Device. *Spine (Phila Pa 1976)*. 2021 Jan 15;46(2). doi: 10.1097/BRS.0000000000003710. PMID: 32991515.
16. Chi JH. Making a Good Surgery Even Better. *Neurospine*. 2021 Mar;18(1):197-198. doi: 10.14245/ns.2142164.082. Epub 2021 Mar 31. PMID: 33819946; PMCID: PMC8021824.
17. Calvachi-Prieto P, McAvoy MB, Cerecedo-Lopez CD, Lu Y, Chi JH, Aglio LS, Smith TR, Gormley WB, Groff MW, Mekary RA, Zaidi HA. Expandable Versus Static Cages in Minimally Invasive Lumbar Interbody Fusion: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2021 Jul;151. doi: 10.1016/j.wneu.2021.04.090. Epub 2021 Apr 30. PMID: 33940268.
18. Chi JH, Wu CH, Huang YH, Shu CM. Recycling furnace slag and fly ash from industrial byproducts to produce slag/ash based zeolite as a new adsorbent material. *Sci Prog*. 2021 Jul;104(3_suppl):368504221086707. doi: 10.1177/00368504221086707. PMID: 35322743; PMCID: PMC10450755.
19. Hauser BM, Gupta S, Hoffman SE, Zaki MM, Roffler AA, Cote DJ, Lu Y, Chi JH, Groff MW, Khawaja AM, Smith TR, Zaidi HA. Adult sports-related traumatic spinal injuries: do different activities predispose to certain injuries? *J Neurosurg Spine*. 2021 Aug 24:1-7. doi: 10.3171/2021.1.SPINE201860. Epub ahead of print. PMID: 35354117; PMCID: PMC9751847.
20. Chi JH, Nunley PD, Huang KT, Krag MH, Bydon M, Lavoie S, Lu Y, Driver J, Stone MB. Two-Year Outcomes From a Prospective Multicenter Investigation Device Trial of a Novel Conformal Mesh Interbody Fusion Device. *Int J Spine Surg*. 2021 Dec;15(6):1103-1114. doi: 10.14444/8169. Epub 2022 Jan 25. PMID: 35086867; PMCID: PMC9541662.

21. Wang TY, Mehta VA, Gabr M, Sankey EW, Bwensa A, Rory Goodwin C, Karikari IO, Chi JH, Abd-El-Barr MM. Percutaneous Lumbar Interbody Fusion With an Expandable Titanium Cage Through Kambin's Triangle: A Case Series With Initial Clinical and Radiographic Results. *Int J Spine Surg.* 2021 Dec;15(6):1133-1141. doi: 10.14444/8144. PMID: 35086870; PMCID: PMC9469038.
22. Ibn Essayed W, Rassi M, Chi JH, Al-Mefty O. Multicentric Chordoma With Initial Resection by Bilateral Transcondylar Approach: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown).* 2022 Jan 1;22(1). doi: 10.1227/ONS.0000000000000001. PMID: 34982910.
23. Chi JH, Lee BJ. Risk factors for hypertension and diabetes comorbidity in a Korean population: A cross-sectional study. *PLoS One.* 2022 Jan 19;17(1). doi: 10.1371/journal.pone.0262757. PMID: 35045123; PMCID: PMC8769319.
24. Hauser BM, McNulty J, Zaki MM, Gupta S, Cote DJ, Bernstock JD, Lu Y, Chi JH, Groff MW, Khawaja AM, Smith TR, Zaidi HA. Predictors of thoracic and lumbar spine injuries in patients with TBI: A nationwide analysis. *Injury.* 2022 Mar;53(3):1087-1093. doi: 10.1016/j.injury.2021.09.060. Epub 2021 Oct 2. PMID: 34625238; PMCID: PMC8863622.
25. Driver J, Dorman JK, Chi JH. A Novel Mobile Device-Based Navigation System for Placement of Posterior Spinal Fixation. *Oper Neurosurg (Hagerstown).* 2022 Apr 1;22(4):249-254. doi: 10.1227/ONS.0000000000000116. PMID: 35156942.
26. Blitz SE, Chua MMJ, Klinger NV, Chi JH. Spinal osteomyelitis and epidural abscess caused by ureterovertebral fistula: A case report. *Surg Neurol Int.* 2022 Jul 1;13:279. doi: 10.25259/SNI_479_2022. PMID: 35855137; PMCID: PMC9282813.
27. Chi JH, Lee BJ. Association of myocardial infarction and angina pectoris with obesity and biochemical indices in the South Korean population. *Sci Rep.* 2022 Aug 12;12(1):13769. doi: 10.1038/s41598-022-17961-y. PMID: 35962047; PMCID: PMC9374724.
28. Coric D, Nassr A, Kim PK, Welch WC, Robbins S, DeLuca S, Whiting D, Chahlavi A, Pirris SM, Groff MW, Chi JH, Huang JH, Kent R, Whitmore RG, Meyer SA, Arnold PM, Patel AI, Orr RD, Krishnaney A, Boltes P, Anekstein Y, Steinmetz MP. Prospective, randomized controlled multicenter study of posterior lumbar facet arthroplasty for the treatment of spondylolisthesis. *J Neurosurg Spine.* 2022 Sep 23;38(1):115-125. doi: 10.3171/2022.7.SPINE22536. PMID: 36152329.
29. Liu J, Chi JH, Lu ZL, Fu W. The specific signs of lung ultrasound to diagnose pulmonary hemorrhage of the newborns: Evidence from a multicenter retrospective case-control study. *Front Pediatr.* 2023 Jan 18;11:1090332. doi: 10.3389/fped.2023.1090332. PMID: 36743886; PMCID: PMC9890160.
30. Chi JH. Commentary on "Carbon Fiber-Reinforced Polyetheretherketone Spinal Implants for Treatment of Spinal Tumors: Perceived Advantages and Limitations". *Neurospine.* 2023 Mar;20(1):327-328. doi: 10.14245/ns.2346314.157. Epub 2023 Mar 31. PMID: 37016880; PMCID: PMC10080428.
31. Gao Y, Liu CJ, Li HY, Xiong XM, Li GL, In 't Veld SGJG, Cai GY, Xie GY, Zeng SQ, Wu Y, Chi JH, Liu JH, Zhang Q, Jiao XF, Shi LL, Lu WR, Lv WG, Yang XS, Piek MJJ, de Kroon CD, Lok CAR, Supernat A, Łapińska-Szumczyk S, Łojkowska A, Żaczek AJ, Jassem J, Tannous BA, Sol N, Post E, Best MG, Kong BH, Xie X, Ma D, Wurdinger T, Guo AY, Gao QL. Platelet RNA enables accurate detection of ovarian cancer: an intercontinental, biomarker identification study. *Protein Cell.* 2023 Jun 7;14(6):579-590. doi: 10.1093/procel/pwac056. PMID: 36905391; PMCID: PMC10246718.
32. Tabarestani TQ, Sykes DAW, Kouam RW, Salven DS, Wang TY, Mehta VA, Shaffrey CI, Wiggins WF, Chi JH, Abd-El-Barr MM. Novel Approach to Percutaneous Lumbar Surgeries via Kambin's Triangle-Radiographic and Surgical Planning Analysis with Nerve Segmentation Technology. *World Neurosurg.* 2023 Jun 22 (23)00830-6. doi: 10.1016/j.wneu.2023.06.061. Epub ahead of print. PMID: 37355168.
33. Liu CJ, Li HY, Gao Y, Xie GY, Chi JH, Li GL, Zeng SQ, Xiong XM, Liu JH, Shi LL, Li X, Cheng XD, Song K, Ma D, Guo AY, Gao QL. Platelet RNA signature independently predicts ovarian cancer prognosis by deep learning neural network model. *Protein Cell.* 2023 Aug 1;14(8):618-622. doi: 10.1093/procel/pwac053. PMID: 37526343; PMCID: PMC10392027.
34. Chi JH, Lee BJ. Association between arthritis and hand grip strength indices combined with anthropometry in an older Korean population. *PLoS One.* 2023 Aug 31;18(8). doi: 10.1371/journal.pone.0291046. PMID: 37651431; PMCID: PMC10470972.
35. Oren RL, Grasfield RH, Friese MB, Chibnik LB, Chi JH, Groff MW, Kang JD, Xie Z, Culley DJ, Crosby G. Geriatric Surgery Produces a Hypoactive Molecular Phenotype in the Monocyte Immune Gene Transcriptome. *J Clin Med.* 2023 Sep 28;12(19):6271. doi: 10.3390/jcm12196271. PMID: 37834915; PMCID: PMC10573997.
36. Lee BJ, Chi JH. Association between anemia and grip strength indices combined with anthropometry in the Korean population. *Sci Rep.* 2023 Oct 28;13(1):18517. doi: 10.1038/s41598-023-45985-5. PMID: 37898727; PMCID: PMC10613214.
37. Driver J, Santagata S, Bi WL, Chi JH. Genomic analysis of spinal meningiomas: correlation with histopathological grade. *J Neurosurg Spine.* 2023 Aug 25;39(6):729-733. doi: 10.3171/2023.6.SPINE23425. PMID: 37728381.
38. Fang KT, Hung H, Lau NYS, Chi JH, Wu DC, Cheng KH. Development of a Genetically Engineered Mouse Model Recapitulating LKB1 and PTEN Deficiency in Gastric Cancer Pathogenesis. *Cancers (Basel).* 2023 Dec 18;15(24):5893. doi: 10.3390/cancers15245893. PMID: 38136437; PMCID: PMC10741874.
39. Tabarestani TQ, Wang TY, Sykes DAW, Mehta VA, Yang LZ, Chow SC, Shaffrey CI, Wiggins WF, Chi JH, Abd-El-Barr MM. Two-Year Clinical and Radiographic Outcomes for Percutaneous Lumbar Interbody Fusion With an Expandable Titanium Cage Through Kambin's Triangle Without Facetectomy. *Int J Spine Surg.* 2023 Dec 26;17(6):760-770. doi: 10.14444/8540. PMID: 37553259; PMCID: PMC10753344.
40. Tabarestani TQ, Salven DS, Sykes DAW, Bardeesi AM, Bartlett AM, Wang TY, Paturu MR, Dibble CF, Shaffrey CI, Ray WZ, Chi JH, Wiggins WF, Abd-El-Barr MM. Using Novel Segmentation Technology to Define Safe Corridors for Minimally Invasive Posterior Lumbar Interbody Fusion. *Oper Neurosurg (Hagerstown).* 2023 Dec 27. doi: 10.1227/ons.0000000000001046. Epub ahead of print. PMID: 38149852.
41. Chi JH. Commentary on "Clinical Characteristics, Surgical Outcomes, and Risk Factors for Emergency Surgery in Patients With Spinal Metastases: A Prospective Cohort Study". *Neurospine.* 2024 Mar;21(1):328-329. doi: 10.14245/ns.2448238.119. Epub 2024 Mar 31. PMID: 38569645; PMCID: PMC10992632.
42. Chi JH, Lee BJ. Association of relative hand grip strength with myocardial infarction and angina pectoris in the Korean population: a large-scale cross-sectional study. *BMC Public Health.* 2024 Apr 2;24(1):941. doi: 10.1186/s12889-024-18409-w. PMID: 38566101; PMCID: PMC10986018.
43. Drossopoulos PN, Ononogbu-Uche FC, Tabarestani TQ, Huang CC, Paturu M, Bardeesi A, Ray WZ, Shaffrey CI, Goodwin CR, Erickson M, Chi JH, Abd-El-Barr MM. Evolution of the Transforaminal Lumbar Interbody Fusion (TLIF): From Open to Percutaneous to Patient-Specific. *J Clin Med.* 2024 Apr 14;13(8):2271. doi: 10.3390/jcm13082271. PMID: 38673544; PMCID: PMC11051479.
44. Nassr A, Coric D, Pinter ZW, Sebastian AS, Freedman BA, Whiting D, Chahlavi A, Pirris S, Phan N, Meyer SA, Tahernia AD, Sandhu F, Deutsch H, Potts EA, Cheng J, Chi JH, Groff M, Anekstein Y, Steinmetz MP, Welch WC. Lumbar Facet Arthroplasty Versus Fusion for Grade-I Degenerative Spondylolisthesis with Stenosis: A Prospective Randomized Controlled Trial. *J Bone Joint Surg Am.* 2024 Jun 19;106(12):1041-1053. doi: 10.2106/JBJS.23.00719. Epub 2024 May 7. PMID: 38713762.
45. Tabarestani TQ, Drossopoulos PN, Huang CC, Bartlett AM, Paturu MR, Shaffrey CI, Chi JH, Ray WZ, Goodwin CR, Amrhein TJ, Abd-El-Barr MM. The Importance of Planning Ahead: A Three-Dimensional Analysis of the Novel Trans-Facet Corridor for Posterior Lumbar Interbody Fusion Using Segmentation Technology. *World Neurosurg.* 2024 Aug;188. doi: 10.1016/j.wneu.2024.05.091. Epub 2024 May 20. PMID: 38777315.
46. Pisansky AJB, MacDougall BJ, Ross EL, Chi JH, Neville G, Yaksh TL. Catheter Tip-Associated Mass With Continuous Infusion of Sufentanil for Persistent Spinal Pain Syndrome Type 2: A Case Report Including Histopathologic Examination and Review of the Associated Basic and Clinical Research. *Neuromodulation.* 2024 Oct;27(7):1140-1148. doi: 10.1016/j.neurom.2023.12.008. Epub 2024 Mar 5. PMID: 38441505.



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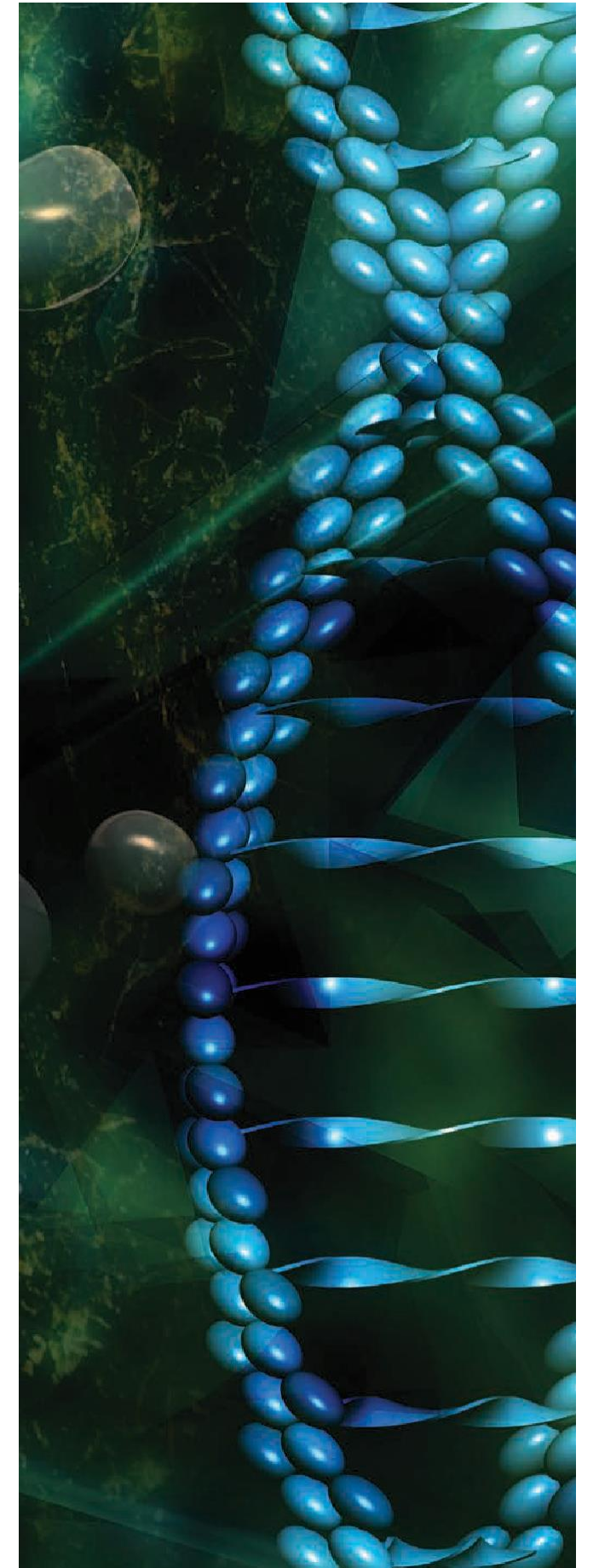
PUBLICATIONS

1. Passaro C, Alayo Q, DeLaura I, McNulty J, Grauwet K, Ito H, Bhaskaran V, Mineo M, Lawler SE, Shah K, Speranza MC, Goins W, McLaughlin E, Fernandez S, Reardon DA, Freeman GJ, Chiocca EA, Nakashima H. Correction: Arming an Oncolytic Herpes Simplex Virus Type 1 with a Single-chain Fragment Variable Antibody against PD-1 for Experimental Glioblastoma Therapy. *Clin Cancer Res.* 2020 Feb 1;26(3):758. doi: 10.1158/1078-0432.CCR-19-4091. PMID: 32014888.
2. Ricklefs FL, Maire CL, Matschke J, Dührsen L, Sauvigny T, Holz M, Kolbe K, Peine S, Herold-Mende C, Carter B, Chiocca EA, Lawler SE, Westphal M, Lamszus K. FASN Is a Biomarker Enriched in Malignant Glioma-Derived Extracellular Vesicles. *Int J Mol Sci.* 2020 Mar 12;21(6):1931. doi: 10.3390/ijms21061931. PMID: 32178271; PMCID: PMC7139767.
3. Alayo QA, Ito H, Passaro C, Zdioruk M, Mahmoud AB, Grauwet K, Zhang X, Lawler SE, Reardon DA, Goins WF, Fernandez S, Chiocca EA, Nakashima H. Glioblastoma infiltration of both tumor- and virus-antigen specific cytotoxic T cells correlates with experimental virotherapy responses. *Sci Rep.* 2020 Mar 20;10(1):5095. doi: 10.1038/s41598-020-61736-2. PMID: 32198420; PMCID: PMC7083912.
4. Touat M, Li YY, Boynton AN, Spurr LF, Iorgulescu JB, Bohrsen CL, Cortes-Ciriano I, Birzu C, Geduldig JE, Pelton K, Lim-Fat MJ, Pal S, Ferrer-Luna R, Ramkissoon SH, Dubois F, Bellamy C, Currimjee N, Bonardi J, Qian K, Ho P, Malinowski S, Taquet L, Jones RE, Shetty A, Chow KH, Sharaf R, Pavlick D, Albacker LA, Younan N, Baldini C, Verreault M, Giry M, Guillerm E, Ammari S, Beuvon F, Mokhtari K, Alentorn A, Dehais C, Houillier C, Laigle-Donadey F, Psimaras D, Lee EQ, Nayak L, McFaline-Figueroa JR, Carpentier A, Cornu P, Capelle L, Mathon B, Barnholtz-Sloan JS, Chakravarti A, Bi WL, Chiocca EA, Fehnel KP, Alexandrescu S, Chi SN, Haas-Kogan D, Batchelor TT, Frampton GM, Alexander BM, Huang RY, Ligon AH, Coulet F, Delattre JY, Hoang-Xuan K, Meredith DM, Santagata S, Duval A, Sanson M, Cherniack AD, Wen PY, Reardon DA, Marabelle A, Park PJ, Idbaih A, Beroukhim R, Bandopadhyay P, Bielle F, Ligon KL. Mechanisms and therapeutic implications of hypermutation in gliomas. *Nature.* 2020 Apr;580(7804):517-523. doi: 10.1038/s41586-020-2209-9. PMID: 32322066; PMCID: PMC8235024.
5. Lawler SE, Chiocca EA, Cook CH. Cytomegalovirus Encephalopathy during Brain Tumor Irradiation. *Clin Cancer Res.* 2020 Jul 1;26(13):3077-3078. doi: 10.1158/1078-0432.CCR-20-0646. PMID: 32276942.
1. von Spreckelsen N, Waldt N, Poetschke R, Kessler C, Dohmen H, Jiao HK, Nemeth A, Schob S, Scherlach C, Sandalcioglu IE, Deckert M, Angenstein F, Krischek B, Stavrinou P, Timmer M, Remke M, Kirches E, Goldbrunner R, Chiocca EA, Huettelmaier S, Acker T, Mawrin C. KLF4^{K409Q}-mutated meningiomas show enhanced hypoxia signaling and respond to mTORC1 inhibitor treatment. *Acta Neuropathol Commun.* 2020 Apr 3;8(1):41. doi: 10.1186/s40478-020-00912-x. PMID: 32245394; PMCID: PMC7118946.
2. Bronisz A, Salińska E, Chiocca EA, Godlewski J. Hypoxic Roadmap of Glioblastoma-Learning about Directions and Distances in the Brain Tumor Environment. *Cancers (Basel).* 2020 May 13;12(5):1213. doi: 10.3390/cancers12051213. PMID: 32413951; PMCID: PMC7281616.
3. Chiocca EA, Nakashima H, Kasai K, Fernandez SA, Oglesbee M. Preclinical Toxicology of rQNestin34.5v.2: An Oncolytic Herpes Virus with Transcriptional Regulation of the ICP34.5 Neurovirulence Gene. *Mol Ther Methods Clin Dev.* 2020 Mar 30;17:871-893. doi: 10.1016/j.omtm.2020.03.028. PMID: 32373649; PMCID: PMC7195500.
4. Mineo M, Lyons SM, Zdioruk M, von Spreckelsen N, Ferrer-Luna R, Ito H, Alayo QA, Kharel P, Giantini Larsen A, Fan WY, Auduong S, Grauwet K, Passaro C, Khalsa JK, Shah K, Reardon DA, Ligon KL, Beroukhim R, Nakashima H, Ivanov P, Anderson PJ, Lawler SE, Chiocca EA. Tumor Interferon Signaling Is Regulated by a lncRNA INCR1 Transcribed from the PD-L1 Locus. *Mol Cell.* 2020 Jun 18;78(6):1207-1223.e8. doi: 10.1016/j.molcel.2020.05.015. PMID: 32504554; PMCID: PMC7377926.
1. Carter BS, Chiocca EA. Editorial. COVID-19 and academic neurosurgery. *J Neurosurg.* 2020 Apr 17;133(1):8-9. doi: 10.3171/2020.4.JNS201013. PMID: 32302992; PMCID: PMC7164322.
2. Fadzen CM, Wolfe JM, Zhou W, Cho CF, von Spreckelsen N, Hutchinson KT, Lee YC, Chiocca EA, Lawler SE, Yilmaz OH, Lippard SJ, Pentelute BL. A Platinum(IV) Prodrug-Perfluoroaryl Macrocylic Peptide Conjugate Enhances Platinum Uptake in the Brain. *J Med Chem.* 2020 Jul 9;63(13):6741-6747. doi: 10.1021/acs.jmedchem.0c00022. PMID: 32410451; PMCID: PMC7992430.
3. Arnaout O, Patel A, Carter B, Chiocca EA. Letter: Adaptation Under Fire: Two Harvard Neurosurgical Services During the COVID-19 Pandemic. *Neurosurgery.* 2020 Aug 1;87(2). doi: 10.1093/neuros/nyaa146. PMID: 32302387; PMCID: PMC7188151.
4. Wen PY, Weller M, Lee EQ, Alexander BM, Barnholtz-Sloan JS, Barthel FP, Batchelor TT, Bindra RS, Chang SM, Chiocca EA, Cloughesy TF, DeGroot JF, Galanis E, Gilbert MR, Hegi ME, Horbinski C, Huang RY, Lassman AB, Le Rhun E, Lim M, Mehta MP, Mellinghoff IK, Minniti G, Nathanson D, Platten M, Preusser M, Roth P, Sanson M, Schiff D, Short SC, Taphoorn MJB, Tonn JC, Tsang J, Verhaak RGW, von Deimling A, Wick W, Zadeh G, Reardon DA, Aldape KD, van den Bent MJ. Glioblastoma in adults: a Society for Neuro-Oncology (SNO) and European Society of Neuro-Oncology (EANO) consensus review on current management and future directions. *Neuro Oncol.* 2020 Aug 17;22(8):1073-1113. doi: 10.1093/neuonc/noaa106. PMID: 32328653; PMCID: PMC7594557.
5. Lonser RR, Zipfel GJ, Chiocca EA. National Institute of Neurological Disorders and Stroke: current funding status, opportunities, challenges, emerging scientific advances, and recommendations for neurosurgery. *J Neurosurg.* 2020 Jul 3;133(4):1264-1269. doi: 10.3171/2020.4.JNS201202. PMID: 32619985.
6. Perlman O, Ito H, Gilad AA, McMahon MT, Chiocca EA, Nakashima H, Farrar CT. Redesigned reporter gene for improved proton exchange-based molecular MRI contrast. *Sci Rep.* 2020 Nov 26;10(1):20664. doi: 10.1038/s41598-020-77576-z. PMID: 33244130; PMCID: PMC7692519.
7. Koch MS, Lawler SE, Chiocca EA. HSV-1 Oncolytic Viruses from Bench to Bedside: An Overview of Current Clinical Trials. *Cancers (Basel).* 2020 Nov 26;12(12):3514. doi: 10.3390/cancers12123514. PMID: 33255871; PMCID: PMC7760226.
8. Lawler SE, Nowicki MO, Ricklefs FL, Chiocca EA. Immune Escape Mediated by Exosomal PD-L1 in Cancer. *Adv Biosyst.* 2020 Dec;4(12). doi: 10.1002/adbi.202000017. PMID: 32383351; PMCID: PMC7968115.

18. Schweiger MW, Li M, Giovanazzi A, Fleming RL, Tabet EI, Nakano I, Würdinger T, Chiocca EA, Tian T, Tannous BA. Extracellular Vesicles Induce Mesenchymal Transition and Therapeutic Resistance in Glioblastomas through NF- κ B/STAT3 Signaling. *Adv Biosyst*. 2020 Dec;4(12). doi: 10.1002/adbi.201900312. PMID: 32519463; PMCID: PMC7718424.
19. Bronisz A, Roj AK, Krawczyński K, Peruzzi P, Salińska E, Nakano I, Purow B, Chiocca EA, Godlewski J. The nuclear DICER-circular RNA complex drives the deregulation of the glioblastoma cell microRNAome. *Sci Adv*. 2020 Dec 16;6(51). doi: 10.1126/sciadv.abc0221. PMID: 33328224; PMCID: PMC7744081.
20. Glorioso JC, Cohen JB, Goins WF, Hall B, Jackson JW, Kohanbash G, Amankulor N, Kaur B, Caligiuri MA, Chiocca EA, Holland EC, Quéva C. Oncolytic HSV Vectors and Anti-Tumor Immunity. *Curr Issues Mol Biol*. 2021;41:381-468. doi: 10.21775/cimb.041.381. PMID: 32938804.
21. Iorgulescu JB, Gokhale PC, Speranza MC, Eschle BK, Poitras MJ, Wilkens MK, Soroko KM, Chhoeu C, Knott A, Gao Y, Lim-Fat MJ, Baker GJ, Bonal DM, Nguyen QD, Grant GRL, Ligon KL, Sorger PK, Chiocca EA, Anderson AC, Kirschmeier PT, Sharpe AH, Freeman GJ, Reardon DA. Concurrent Dexamethasone Limits the Clinical Benefit of Immune Checkpoint Blockade in Glioblastoma. *Clin Cancer Res*. 2021 Jan 1;27(1):276-287. doi: 10.1158/1078-0432.CCR-20-2291. PMID: 33239433; PMCID: PMC8034990.
22. Olsen HE, Lynn GM, Valdes PA, Cerecedo Lopez CD, Ishizuka AS, Arnaout O, Bi WL, Peruzzi PP, Chiocca EA, Friedman GK, Bernstock JD. Therapeutic cancer vaccines for pediatric malignancies: advances, challenges, and emerging technologies. *Neurooncol Adv*. 2021 Feb 11;3(1). doi: 10.1093/neoajnl/vdab027. PMID: 33860227; PMCID: PMC8034661.
23. Yamashita D, Bernstock JD, Elsayed G, Sadahiro H, Mohyeldin A, Chagoya G, Ilyas A, Mooney J, Estevez-Ordonez D, Yamaguchi S, Flanary VL, Hackney JR, Bhat KP, Kornblum HI, Zamboni N, Kim SH, Chiocca EA, Nakano I. Targeting glioma-initiating cells via the tyrosine metabolic pathway. *J Neurosurg*. 2020 Feb 14;134(3):721-732. doi: 10.3171/2019.11.JNS192028. PMID: 32059178; PMCID: PMC8447888.
24. Casillo SM, Venkatesh A, Muthiah N, Agarwal N, Scott T, Romani R, Fernández LL, Aristizabal S, Ginalis EE, Ozair A, Bhat V, Faruqi A, Bajaj A, Sonkar AA, Ikeda DS, Chiocca EA, Lonser RR, Sutton TE, McGregor JM, Rea GL, Schunemann VA, Ngwenya LB, Marlin ES, Porensky PN, Shaikhouni A, Huntoon K, Dornbos D, Shaw AB, Powers CJ, Gluski JM, Culver LG, Goodwin AM, Ham S, Marupudi NI, Bhat DI, Berry KM, Wu EM, Wang MY. Biographies of international women leaders in neurosurgery. *Neurosurg Focus*. 2021 Mar;50(3). doi: 10.3171/2021.1.FOCUS201096. PMID: 33789227.
25. Mathewson ND, Ashenberg O, Tirosh I, Gritsch S, Perez EM, Marx S, Jerby-Arnon L, Chanoch-Myers R, Hara T, Richman AR, Ito Y, Pyrdol J, Friedrich M, Schumann K, Poitras MJ, Gokhale PC, Gonzalez Castro LN, Shore ME, Hebert CM, Shaw B, Cahill HL, Drummond M, Zhang W, Olawoyin O, Wakimoto H, Rozenblatt-Rosen O, Brastianos PK, Liu XS, Jones PS, Cahill DP, Frosch MP, Louis DN, Freeman GJ, Ligon KL, Marson A, Chiocca EA, Reardon DA, Regev A, Suvà ML, Wucherpennig KW. Inhibitory CD161 receptor identified in glioma-infiltrating T cells by single-cell analysis. *Cell*. 2021 Mar 4;184(5):1281-1298.e26. doi: 10.1016/j.cell.2021.01.022. PMID: 33592174; PMCID: PMC7935772.
26. Godlewski J, Farhath M, Ricklefs FL, Passaro C, Kiel K, Nakashima H, Chiocca EA, Bronisz A. Oncolytic Virus Therapy Alters the Secretome of Targeted Glioblastoma Cells. *Cancers (Basel)*. 2021 Mar 14;13(6):1287. doi: 10.3390/cancers13061287. PMID: 33799381; PMCID: PMC7999647.
27. Chuntova P, Chow F, Watchmaker PB, Galvez M, Heimberger AB, Newell EW, Diaz A, DePinho RA, Li MO, Wherry EJ, Mitchell D, Terabe M, Wainwright DA, Berzofsky JA, Herold-Mende C, Heath JR, Lim M, Margolin KA, Chiocca EA, Kasahara N, Ellingson BM, Brown CE, Chen Y, Fecci PE, Reardon DA, Dunn GP, Liao LM, Costello JF, Wick W, Cloughesy T, Timmer WC, Wen PY, Prins RM, Platten M, Okada H. Unique challenges for glioblastoma immunotherapy-discussions across neuro-oncology and non-neuro-oncology experts in cancer immunology. *Neuro Oncol*. 2021 Mar 25;23(3):356-375. doi: 10.1093/neoonc/noaa277. PMID: 33367885; PMCID: PMC7992879.
28. Wen PY, Weller M, Chiocca EA, Lim M, Tonn JC, Zadeh G, Aldape K, van den Bent M. Role of surgery for glioblastoma: response to letters from Dr. Gerritsen and his colleagues and Dr. Vargas Lopez. *Neuro Oncol*. 2021 Mar 25;23(3):506-507. doi: 10.1093/neoonc/noaa305. PMID: 33471080; PMCID: PMC7992881.
29. von Spreckelsen N, Fadzen CM, Hartrampf N, Ghotmi Y, Wolfe JM, Dubey S, Yang BY, Kijewski MF, Wang S, Farquhar C, Bergmann S, Zdioruk M, Wasserburg JR, Scott B, Murrell E, Bononi FC, Luyt LG, DiCarli M, Lamfers MLM, Ligon KL, Chiocca EA, Viapiano MS, Pentelute BL, Lawler SE, Cho CF. Targeting glioblastoma using a novel peptide specific to a deglycosylated isoform of brevican. *Adv Ther (Weinh)*. 2021 Apr;4(4):2000244. doi: 10.1002/adtp.202000244. PMID: 33997269; PMCID: PMC8114962.
30. Bernstock JD, Hoffman SE, Chen JA, Gupta S, Kappel AD, Smith TR, Chiocca EA. The Current Landscape of Oncolytic Herpes Simplex Viruses as Novel Therapies for Brain Malignancies. *Viruses*. 2021 Jun 17;13(6):1158. doi: 10.3390/v13061158. PMID: 34204248; PMCID: PMC8234451.
31. Mansouri A, Beyn ME, Pancholi A, Chow CT, Wang R, Boutet A, Elias GJB, Germann J, Loh A, Voisin MR, Lozano AM, Chiocca EA, Vogelbaum MA, Zadeh G. Evolution of the Neurosurgeon's Role in Clinical Trials for Glioblastoma: A Systematic Overview of the Clinicaltrials.gov Database. *Neurosurgery*. 2021 Jul 15;89(2):196-203. doi: 10.1093/neuros/nyab169. PMID: 33989408.
32. Krenzlin H, Zdioruk M, Nowicki MO, Finkelberg T, Keric N, Lemmermann N, Skubal M, Chiocca EA, Cook CH, Lawler SE. Cytomegalovirus infection of glioblastoma cells leads to NF- κ B dependent upregulation of the c-MET oncogenic tyrosine kinase. *Cancer Lett*. 2021 Aug 10;513:26-35. doi: 10.1016/j.canlet.2021.05.005. PMID: 33989707; PMCID: PMC8209659.
33. Jackson JW, Hall BL, Marzulli M, Shah VK, Bailey L, Chiocca EA, Goins WF, Kohanbash G, Cohen JB, Glorioso JC. Treatment of glioblastoma with current oHSV variants reveals differences in efficacy and immune cell recruitment. *Mol Ther Oncolytics*. 2021 Jul 29;22:444-453. doi: 10.1016/j.omto.2021.07.009. PMID: 34553031; PMCID: PMC8430372.
34. Andersen BM, Faust Akl C, Wheeler MA, Chiocca EA, Reardon DA, Quintana FJ. Glial and myeloid heterogeneity in the brain tumour microenvironment. *Nat Rev Cancer*. 2021 Dec;21(12):786-802. doi: 10.1038/s41568-021-00397-3. PMID: 34584243; PMCID: PMC8616823.
35. Smith LGF, Chiocca EA, Zipfel GJ, Smith AGF, Groff MW, Haid RW, Lonser RR. Neurosurgery Research and Education Foundation funding conversion to National Institutes of Health funding. *J Neurosurg*. 2021 Jun 11;136(1):287-294. doi: 10.3171/2020.11.JNS203871. PMID: 34116507.
36. Koch MS, Zdioruk M, Nowicki MO, Griffith AM, Aguilar E, Aguilar LK, Guzik BW, Barone F, Tak PP, Tabatabai G, Lederer JA, Chiocca EA, Lawler S. Systemic high-dose dexamethasone treatment may modulate the efficacy of intratumoral viral oncolytic immunotherapy in glioblastoma models. *J Immunother Cancer*. 2022 Jan;10(1). doi: 10.1136/jitc-2021-003368. PMID: 35017150; PMCID: PMC8753448.
37. Bi WL, Nayak L, Meredith DM, Driver J, Du Z, Hoffman S, Li Y, Lee EQ, Beroukhi R, Rinne M, McFaline-Figueroa R, Chukwueke U, McCluskey C, Gaffey S, Cherniack AD, Stefanik J, Doherty L, Taubert C, Cifirino M, LaFrankie D, Graillon T, Wen PY, Ligon KL, Al-Mefty O, Huang RY, Muzikansky A, Chiocca EA, Santagata S, Dunn IF, Reardon DA. Activity of PD-1 blockade with nivolumab among patients with recurrent atypical/anaplastic meningioma: phase II trial results. *Neuro Oncol*. 2022 Jan 5;24(1):101-113. doi: 10.1093/neoonc/noab118. PMID: 34015129; PMCID: PMC8730772.
38. Peruzzi P, Valdes PQ, Aghi MK, Berger M, Chiocca EA, Golby AJ. The Evolving Role of Neurosurgical Intervention for Central Nervous System Tumors. *Hematol Oncol Clin North Am*. 2022 Feb;36(1):63-75. doi: 10.1016/j.hoc.2021.08.003. PMID: 34565649.
39. Blitz SE, Kappel AD, Gessler FA, Klinger NV, Arnaout O, Lu Y, Peruzzi PP, Smith TR, Chiocca EA, Friedman GK, Bernstock JD. Tumor-Associated Macrophages/Microglia in Glioblastoma Oncolytic Virotherapy: A Double-Edged Sword. *Int J Mol Sci*. 2022 Feb 4;23(3):1808. doi: 10.3390/ijms23031808. PMID: 35163730; PMCID: PMC8836356.
40. Tian T, Liang R, Erel-Akbaba G, Saad L, Obeid PJ, Gao J, Chiocca EA, Weissleder R, Tannous BA. Immune Checkpoint Inhibition in GBM Primed with Radiation by Engineered Extracellular Vesicles. *ACS Nano*. 2022 Feb 22;16(2):1940-1953. doi: 10.1021/acsnano.1c05505. PMID: 35099172; PMCID: PMC9020451.

41. Otani Y, Yoo JY, Lewis CT, Chao S, Swanner J, Shimizu T, Kang JM, Murphy SA, Rivera-Caraballo K, Hong B, Glorioso JC, Nakashima H, Lawler SE, Banasavadi-Siddegowda Y, Heiss JD, Yan Y, Pei G, Caligiuri MA, Zhao Z, Chiocca EA, Yu J, Kaur B. NOTCH-Induced MDSC Recruitment after oHSV Virotherapy in CNS Cancer Models Modulates Antitumor Immunotherapy. *Clin Cancer Res.* 2022 Apr 1;28(7):1460-1473. doi: 10.1158/1078-0432.CCR-21-2347. PMID: 35022322; PMCID: PMC8976724.
42. van Solinge TS, Nieland L, Chiocca EA, Broekman MLD. Advances in local therapy for glioblastoma - taking the fight to the tumour. *Nat Rev Neurol.* 2022 Apr;18(4):221-236. doi: 10.1038/s41582-022-00621-0. PMID: 35277681; PMCID: PMC10359969.
43. Perlman O, Ito H, Herz K, Shono N, Nakashima H, Zaiss M, Chiocca EA, Cohen O, Rosen MS, Farrar CT. Quantitative imaging of apoptosis following oncolytic virotherapy by magnetic resonance fingerprinting aided by deep learning. *Nat Biomed Eng.* 2022 May;6(5):648-657. doi: 10.1038/s41551-021-00809-7. PMID: 34764440; PMCID: PMC9091056.
44. Bhere D, Choi SH, van de Donk P, Hope D, Gortzak K, Kunnummal A, Khalsa J, Revai Lechtich E, Reinshagen C, Leon V, Nissar N, Bi WL, Feng C, Li H, Zhang YS, Liang SH, Vasdev N, Essayed W, Quevedo PV, Golby A, Abdi R, Wakimoto H, Bauer G, Chiocca EA. Target receptor identification and treatment of resected brain tumors with encapsulated and engineered allogeneic stem cells. *Nat Commun.* 2022 May 19;13(1):2810. doi: 10.1038/s41467-022-30558-3. PMID: 35589724; PMCID: PMC9120173.
45. Chiocca EA, Gelb AB, Chen CC, Rao G, Reardon DA, Wen PY, Bi WL, Peruzzi P, Amidei C, Triggs D, Sefton L, Park G, Grant J, Truman K, Buck JY, Hadar N, Demars N, Miao J, Estupinan T, Loewy J, Chadha K, Tringali J, Cooper L, Lukas RV. Combined immunotherapy with controlled interleukin-12 gene therapy and immune checkpoint blockade in recurrent glioblastoma: An open-label, multi-institutional phase I trial. *Neuro Oncol.* 2022 Jun 1;24(6):951-963. doi: 10.1093/neuonc/noab271. PMID: 34850166; PMCID: PMC9159462.
46. Jenner AL, Smalley M, Goldman D, Goins WF, Cobbs CS, Puchalski RB, Chiocca EA, Lawler S, Macklin P, Goldman A, Craig M. Agent-based computational modeling of glioblastoma predicts that stromal density is central to oncolytic virus efficacy. *iScience.* 2022 May 13;25(6):104395. doi: 10.1016/j.isci.2022.104395. PMID: 35637733; PMCID: PMC9142563.
47. Yearley AG, Iorgulescu JB, Chiocca EA, Peruzzi PP, Smith TR, Reardon DA, Mooney MA. The current state of glioma data registries. *Neurooncol Adv.* 2022 Jun 24;4(1). doi: 10.1093/oaajnl/vdac099. PMID: 36196363; PMCID: PMC9521197.
48. Lim-Fat MJ, Youssef GC, Touat M, Iorgulescu JB, Whorral S, Allen M, Rahman R, Chukwueke U, McFaline-Figueroa JR, Nayak L, Lee EQ, Batchelor TT, Arnaout O, Peruzzi PP, Chiocca EA, Reardon DA, Meredith D, Santagata S, Beroukhim R, Bi WL, Ligon KL, Wen PY. Clinical utility of targeted next-generation sequencing assay in IDH-wildtype glioblastoma for therapy decision-making. *Neuro Oncol.* 2022 Jul 1;24(7):1140-1149. doi: 10.1093/neuonc/noab282. PMID: 34878541; PMCID: PMC9248387.
49. Berger G, Knelson EH, Jimenez-Macias JL, Nowicki MO, Han S, Panagioti E, Lizotte PH, Adu-Berchie K, Stafford A, Dimitrakakis N, Zhou L, Chiocca EA, Mooney DJ, Barbie DA, Lawler SE. STING activation promotes robust immune response and NK cell-mediated tumor regression in glioblastoma models. *Proc Natl Acad Sci U S A.* 2022 Jul 12;119(28). doi: 10.1073/pnas.2111003119. PMID: 35787058; PMCID: PMC9282249.
50. Christie JD, Chiocca EA. Treat and repeat: oncolytic virus therapy for brain cancer. *Nat Med.* 2022 Aug;28(8):1540-1542. doi: 10.1038/s41591-022-01901-4. PMID: 35864255.
51. Koch MS, Zdioruk M, Nowicki MO, Griffith AM, Aguilar-Cordova E, Aguilar LK, Guzik BW, Barone F, Tak PP, Schregel K, Hoetker MS, Lederer JA, Chiocca EA, Tabatabai G, Lawler SE. Perturbing DDR signaling enhances cytotoxic effects of local oncolytic virotherapy and modulates the immune environment in glioma. *Mol Ther Oncolytics.* 2022 Jul 31;26:275-288. doi: 10.1016/j.omto.2022.07.009. PMID: 36032633; PMCID: PMC9391522.
52. Ikeda DS, Chiocca EA, Lonser RR, Sutton TE, McGregor JM, Rea GL, Schunemann VA, Ngwenya LB, Marlin ES, Porensky PN, Shaikhouni A, Huntoon K, Dornbos D 3rd, Shaw AB, Thoman WJ, Powers CJ, Carole A, Miller, MD: Matriarch of the Ohio State University's Department of Neurosurgery. *World Neurosurg.* 2022 Oct;166:33-38. doi: 10.1016/j.wneu.2022.07.019. PMID: 35840095.
53. Yao Y, Wang J, Liu Y, Qu Y, Wang K, Zhang Y, Chang Y, Yang Z, Wan J, Liu J, Nakashima H, Lawler SE, Chiocca EA, Cho CF, Bei F. Variants of the adeno-associated virus serotype 9 with enhanced penetration of the blood-brain barrier in rodents and primates. *Nat Biomed Eng.* 2022 Nov;6(11):1257-1271. doi: 10.1038/s41551-022-00938-7. PMID: 36217021.
54. Tian L, Xu B, Chen Y, Li Z, Wang J, Zhang J, Ma R, Cao S, Hu W, Chiocca EA, Kaur B, Caligiuri MA, Yu J. Specific targeting of glioblastoma with an oncolytic virus expressing a cetuximab-CCL5 fusion protein via innate and adaptive immunity. *Nat Cancer.* 2022 Nov;3(11):1318-1335. doi: 10.1038/s43018-022-00448-0. PMID: 36357700; PMCID: PMC10150871.
55. Raghu ALB, Chen JA, Valdes PA, Essayed W, Claus E, Arnaout O, Smith TR, Chiocca EA, Peruzzi PP, Bernstock JD. Cerebellar High-Grade Glioma: A Translationally Oriented Review of the Literature. *Cancers (Basel).* 2022 Dec 28;15(1):174. doi: 10.3390/cancers15010174. PMID: 36612169; PMCID: PMC9818238.
56. Ma R, Li Z, Chiocca EA, Caligiuri MA, Yu J. The emerging field of oncolytic virus-based cancer immunotherapy. *Trends Cancer.* 2023 Feb;9(2):122-139. doi: 10.1016/j.trecan.2022.10.003. PMID: 36402738; PMCID: PMC9877109.
57. Lugani S, Halabi EA, Oh J, Kohler RH, Peterson HM, Breakefield XO, Chiocca EA, Miller MA, Garris CS, Weissleder R. Dual Immunostimulatory Pathway Agonism through a Synthetic Nanocarrier Triggers Robust Anti-Tumor Immunity in Murine Glioblastoma. *Adv Mater.* 2023 Feb;35(7) doi: 10.1002/adma.202208782. PMID: 36427266; PMCID: PMC10197197.
58. Koch MS, Zdioruk M, Nowicki MO, Hoetker MS, Herbert ZT, Barone F, Tak PP, Chiocca EA, Tabatabai G, Lawler SE. Uncovering transcriptomic landscape alterations of CAN-2409 in in vitro and in vivo glioma models. *Front Med (Lausanne).* 2023 May 9;10:1140352. doi: 10.3389/fmed.2023.1140352. PMID: 37228396; PMCID: PMC10203593.
59. Zdioruk M, Jimenez-Macias JL, Nowicki MO, Manz KE, Pennell KD, Koch MS, Finkelberg T, Wu B, Boucher P, Takeda Y, Li W, Piranlioglu R, Ling AL, Chiocca EA, Lawler SE. PPRX-1701, a nanoparticle formulation of 6'-bromindirubin acetoxime, improves delivery and shows efficacy in preclinical GBM models. *Cell Rep Med.* 2023 May 16;4(5):101019. doi: 10.1016/j.xcrm.2023.101019. PMID: 37060903; PMCID: PMC10213750.
60. Villa GR, Chiocca EA. The Role of Long Noncoding Ribonucleic Acids in Glioblastoma: What the Neurosurgeon Should Know. *Neurosurgery.* 2023 Jun 1;92(6):1104-1111. doi: 10.1227/neu.0000000000002449. PMID: 36880757.
61. Toker J, Iorgulescu JB, Ling AL, Villa GR, Gadet JAMA, Parida L, Getz G, Wu CJ, Reardon DA, Chiocca EA, Mineo M. Clinical Importance of the lncRNA NEAT1 in Cancer Patients Treated with Immune Checkpoint Inhibitors. *Clin Cancer Res.* 2023 Jun 13;29(12):2491-2501. doi: 10.1158/1078-0432.CCR-22-3917. PMID: 37017035.
62. Bernstock JD, Blitz SE, Hoffman SE, Gerstl JVE, Chiocca EA, Friedman GK. Recent oncolytic virotherapy clinical trials outline a roadmap for the treatment of high-grade glioma. *Neurooncol Adv.* 2023 Jul 7;5(1). doi: 10.1093/oaajnl/vdad081. PMID: 37497017; PMCID: PMC10368374.
63. Hoffman SE, Gupta S, O'Connor M, Jarvis CA, Zhao M, Hauser BM, Bernstock JD, Murphy S, Raftery SM, Lane K, Chiocca EA, Arnaout O. Reduced time to imaging, length of stay, and hospital charges following implementation of a novel postoperative pathway for craniotomy. *J Neurosurg.* 2023 Jan 6;139(2):373-384. doi: 10.3171/2022.12.JNS222123. PMID: 36609368; PMCID: PMC10904334.
64. Segar DJ, Bernstock JD, Rampersad S, Bi WL, Arnaout O, Friedman GK, Chiocca EA. Intracranial stimulation for brain cancer - The case for implantable, intracranial tumor treating fields. *Neurooncol Adv.* 2023 Aug 19;5(1). doi: 10.1093/oaajnl/vdad100. PMID: 37706199; PMCID: PMC10496941.
65. Bernstock JD, Ling A, Chiocca EA. Combined gene therapies for high-grade glioma. *Lancet Oncol.* 2023 Sep;24(9):949-950. doi: 10.1016/S1470-2045(23)00389-3. PMID: 37657467.
66. Peruzzi P, Dominas C, Fell G, Bernstock JD, Blitz S, Mazzetti D, Zdioruk M, Dawood HY, Triggs DV, Ahn SW, Bhagavatula SK, Davidson SM, Tatarova Z, Pannell M, Truman K, Ball A, Gold MP, Pister V, Fraenkel E, Chiocca EA, Ligon KL, Wen PY, Jonas O. Intratumoral drug-releasing microdevices allow in situ high-throughput pharmacophenotyping in patients with gliomas. *Sci Transl Med.* 2023 Sep 6;15(712). doi: 10.1126/scitranslmed.adi0069. PMID: 37672566; PMCID: PMC10754230.

67. Ling AL, Solomon IH, Landivar AM, Nakashima H, Woods JK, Santos A, Masud N, Fell G, Mo X, Yilmaz AS, Grant J, Zhang A, Bernstock JD, Torio E, Ito H, Liu J, Shono N, Nowicki MO, Triggs D, Halloran P, Piranlioglu R, Soni H, Stopa B, Bi WL, Peruzzi P, Chen E, Malinowski SW, Prabhu MC, Zeng Y, Carlisle A, Rodig SJ, Wen PY, Lee EQ, Nayak L, Chukwueke U, Gonzalez Castro LN, Dumont SD, Batchelor T, Kittelberger K, Tikhonova E, Mihecheva N, Tabakov D, Shin N, Gorbacheva A, Shumskiy A, Frenkel F, Aguilar-Cordova E, Aguilar LK, Krisky D, Wechuck J, Manzanera A, Matheny C, Tak PP, Barone F, Kovarsky D, Tirosh I, Suvà ML, Wucherpfennig KW, Ligon K, Reardon DA, Chiocca EA. Clinical trial links oncolytic immunoactivation to survival in glioblastoma. *Nature*. 2023 Nov;623(7985):157-166. doi: 10.1038/s41586-023-06623-2. PMID: 37853118; PMCID: PMC10620094.
68. Rahman R, Trippa L, Lee EQ, Arrillaga-Romany I, Fell G, Touat M, McCluskey C, Wiley J, Gaffey S, Drappatz J, Welch MR, Galanis E, Ahluwalia MS, Colman H, Nabors LB, Hepel J, Elinzano H, Schiff D, Chukwueke UN, Beroukhir R, Nayak L, McFaline-Figueroa JR, Batchelor TT, Rinne ML, Kaley TJ, Lu-Emerson C, Mellinghoff IK, Bi WL, Arnaout O, Peruzzi PP, Haas-Kogan D, Tanguturi S, Cagney D, Aizer A, Doherty L, Lavallee M, Fisher-Longden B, Dowling S, Geduldig J, Watkinson F, Pisano W, Malinowski S, Ramkissoon S, Santagata S, Meredith DM, Chiocca EA, Reardon DA, Alexander BM, Ligon KL, Wen PY. Inaugural Results of the Individualized Screening Trial of Innovative Glioblastoma Therapy: A Phase II Platform Trial for Newly Diagnosed Glioblastoma Using Bayesian Adaptive Randomization. *J Clin Oncol*. 2023 Dec 20;41(36):5524-5535. doi: 10.1200/JCO.23.00493. PMID: 37722087.
69. Iorgulescu JB, Ruthen N, Ahn R, Panagioti E, Gokhale PC, Neagu M, Speranza MC, Eschle BK, Soroko KM, Piranlioglu R, Datta M, Krishnan S, Yates KB, Baker GJ, Jain RK, Suvà ML, Neuberg D, White FM, Chiocca EA, Freeman GJ, Sharpe AH, Wu CJ, Reardon DA. Antigen presentation deficiency, mesenchymal differentiation, and resistance to immunotherapy in the murine syngeneic CT2A tumor model. *Front Immunol*. 2023 Dec 28;14:1297932. doi: 10.3389/fimmu.2023.1297932. PMID: 38213329; PMCID: PMC10782385.
70. Valdes PA, Yu CJ, Aronson J, Ghosh D, Zhao Y, An B, Bernstock JD, Bhere D, Felicella MM, Viapiano MS, Shah K, Chiocca EA, Boyden ES. Improved immunostaining of nanostructures and cells in human brain specimens through expansion-mediated protein decrowding. *Sci Transl Med*. 2024 Jan 31;16(732). doi: 10.1126/scitranslmed.abo0049. PMID: 38295184; PMCID: PMC10911838.
71. Reddy R, Yan SC, Hasanpour Segherlou Z, Hosseini-Siyanaki MR, Poe J, Perez-Vega C, Chiocca EA, Lucke-Wold B. Oncolytic viral therapy: a review and promising future directions. *J Neurosurg*. 2023 Aug 25;140(2):319-327. doi: 10.3171/2023.6.JNS23243. PMID: 37877961.
72. Ling AL, Chiocca EA. Oncolytic immunoactivation associates with survival in a glioblastoma clinical trial. *Neuro Oncol*. 2024 Feb 2;26(2):209-210. doi: 10.1093/neuonc/noad216. PMID: 37941468; PMCID: PMC10836764.
73. Chen E, Ling AL, Reardon DA, Chiocca EA. Lessons learned from phase 3 trials of immunotherapy for glioblastoma: Time for longitudinal sampling? *Neuro Oncol*. 2024 Feb 2;26(2):211-225. doi: 10.1093/neuonc/noad211. Erratum in: *Neuro Oncol*. 2024 Apr 5;26(4):779. doi: 10.1093/neuonc/noad241. PMID: 37995317; PMCID: PMC10836778.
74. Halloran PJ, Chiocca EA, Santos A. Phantom limb pain, traumatic neuroma, or nerve sheath tumor? Illustrative case. *J Neurosurg Case Lessons*. 2024 Apr 15;7(16). doi: 10.3171/CASE247. PMID: 38621303; PMCID: PMC11023014.
75. Bernstock JD, Johnston BR, Friedman GK, Chiocca EA, Langer R, Srinivasan SS. Leveraging next generation materials for cancer neuroscience therapies in the central nervous system. *Nat Rev Mater*. 2024 Apr 22;9:298-300. doi: 10.1038/s41578-024-00681-2. PMID: 39234424; PMCID: PMC11369983.
76. Vazaios K, Stavrakaki E, Vogelezang LB, Ju J, Waranecki P, Metselaar DS, Meel MH, Kemp V, van den Hoogen BG, Hoeben RC, Chiocca EA, Goins WF, Stubbs A, Li Y, Alonso MM, Calkoen FG, Hulleman E, van der Lugt J, Lamfers MLM. The heterogeneous sensitivity of pediatric brain tumors to different oncolytic viruses is predicted by unique gene expression profiles. *Mol Ther Oncol*. 2024 Apr 15;32(2):200804. doi: 10.1016/j.omton.2024.200804. PMID: 38694569; PMCID: PMC11060958.
77. Bernstock JD, Gerstl JVE, Chen JA, Johnston BR, Nonnenbroich LF, Spanehl L, Gessler FA, Valdes PA, Lu Y, Srinivasan SS, Smith TR, Peruzzi P, Rolston JD, Stone S, Chiocca EA. The Case for Neurosurgical Intervention in Cancer Neuroscience. *Neurosurgery*. 2024 Jun 21. doi: 10.1227/neu.0000000000003039. PMID: 38904388.
78. Maksoud S, Schweiger MW, Tabet EI, Xiao T, Hokayem JE, Zinter M, Carvalho LA, Breyne K, Noske DP, Chiocca EA, Tannous BA. Arming AAV9 with a Single-Chain Fragment Variable Antibody Against PD-1 for Systemic Glioblastoma Therapy. *Mol Neurobiol*. 2024 Aug 14. doi: 10.1007/s12035-024-04406-y. PMID: 39138760.
79. Ghosh HS, Patel RV, Woodward E, Greenwald NF, Bhawe VM, Maury EA, Cello G, Hoffman SE, Li Y, Gupta H, Youssef G, Spurr LF, Vogelzang J, Touat M, Dubois F, Cherniack AD, Guo X, Tavakol S, Cioffi G, Lindeman NI, Ligon AH, Chiocca EA, Reardon DA, Wen PY, Meredith D, Santagata S, Barnholtz-Sloan JS, Ligon KL, Beroukhir R, Bi WL. Contemporary Prognostic Signatures and Refined Risk Stratification of Gliomas: An Analysis of 4,400 Tumors. *Neuro Oncol*. 2024 Aug 21. doi: 10.1093/neuonc/noae164. PMID: 39164213.
80. Noh MH, Kang JM, Miller AA, Nguyen G, Huang M, Shim JS, Bueso-Perez AJ, Murphy SA, Rivera-Caraballo KA, Otani Y, Kim E, Yoo SH, Yan Y, Banasavadi-Siddegowda Y, Nakashima H, Chiocca EA, Kaur B, Zhao Z, Lee TJ, Yoo JY. Targeting IGF2 to reprogram the tumor microenvironment for enhanced viro-immunotherapy. *Neuro Oncol*. 2024 Sep 5;26(9):1602-1616. doi: 10.1093/neuonc/noae105. PMID: 38853689; PMCID: PMC11376453.





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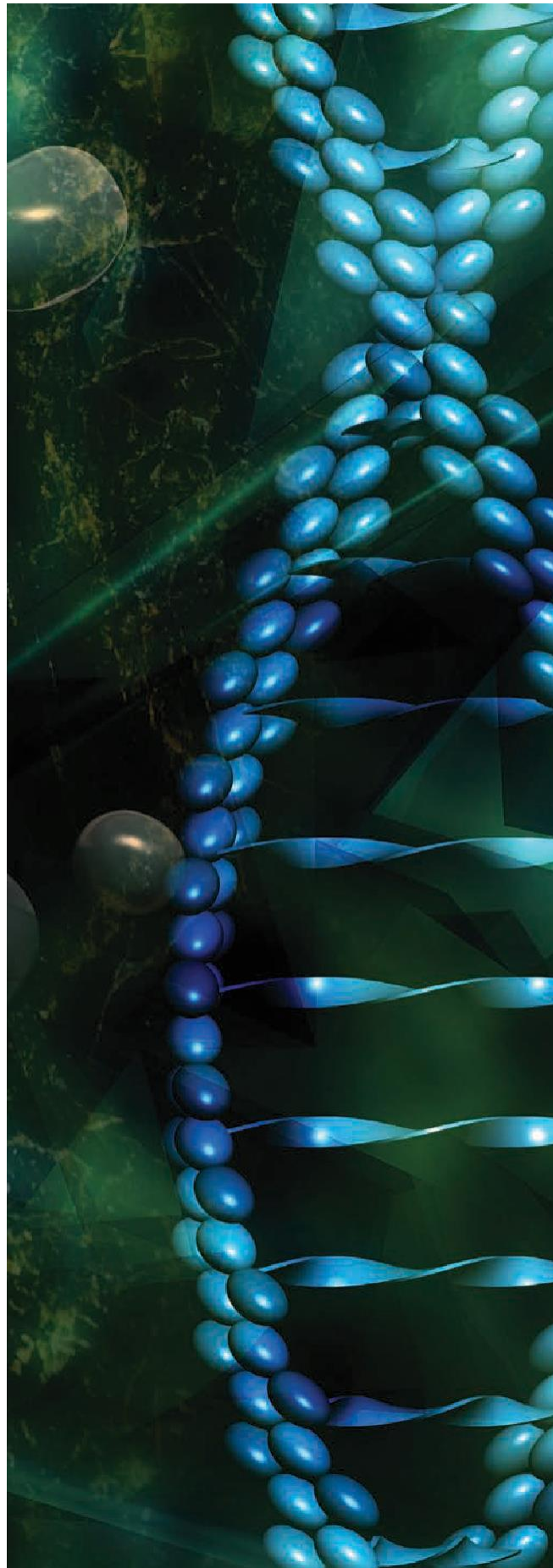
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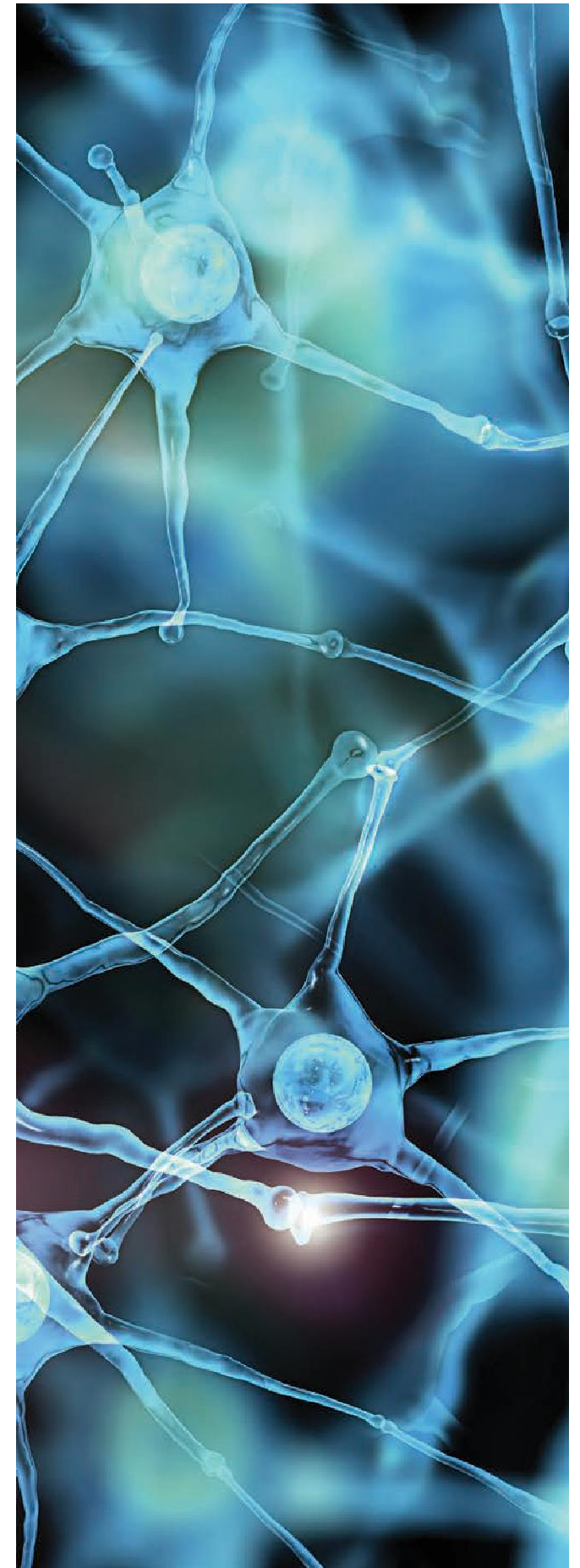
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PUBLICATIONS

- Ostrom QT, Egan KM, Nabors LB, Gerke T, Thompson RC, Olson JJ, LaRocca R, Chowdhary S, Eckel-Passow JE, Armstrong G, Wiencke JK, Bernstein JL, Claus EB, Il'yasova D, Johansen C, Lachance DH, Lai RK, Merrell RT, Olson SH, Sadetzki S, Schildkraut JM, Shete S, Houlston RS, Jenkins RB, Wrensch MR, Melin B, Amos CI, Huse JT, Barnholtz-Sloan JS, Bondy ML. Glioma risk associated with extent of estimated European genetic ancestry in African Americans and Hispanics. *Int J Cancer*. 2020 Feb 1;146(3):739-748. doi: 10.1002/ijc.32318. PMID: 30963577; PMCID: PMC6785354.
- Saunders CN, Cornish AJ, Kinnersley B, Law PJ, Claus EB, Il'yasova D, Schildkraut J, Barnholtz-Sloan JS, Olson SH, Bernstein JL, Lai RK, Chanock S, Rajaraman P, Johansen C, Jenkins RB, Melin BS, Wrensch MR, Sanson M, Bondy ML, Houlston RS. Lack of association between modifiable exposures and glioma risk: a Mendelian randomization analysis. *Neuro Oncol*. 2020 Feb 20;22(2):207-215. doi: 10.1093/neuonc/noz209. PMID: 31665421; PMCID: PMC7442418.
- Claus EB, Feliciano J, Benz LS, Calvocoressi L. Social media partnerships with patient organizations for neuro-oncology patient recruitment. *Neurooncol Pract*. 2020 Mar;7(2):143-151. doi: 10.1093/nop/npz049. PMID: 32626583; PMCID: PMC7318861.
- Feliciano JT, Salmi L, Blotner C, Hayden A, Nduom EK, Kwan BM, Katz MS, Claus EB. Brain Tumor Discussions on Twitter (#BTSM): Social Network Analysis. *J Med Internet Res*. 2020 Oct 8;22(10). doi: 10.2196/22005. PMID: 33030435; PMCID: PMC7582142.
- Zhang C, Ostrom QT, Semmes EC, Ramaswamy V, Hansen HM, Morimoto L, de Smith AJ, Pekmezci M, Vaksman Z, Hakonarson H, Diskin SJ, Metayer C; Glioma International Case-Control Study (GICC); Taylor MD, Wiemels JL, Bondy ML, Walsh KM. Genetic predisposition to longer telomere length and risk of childhood, adolescent and adult-onset ependymoma. *Acta Neuropathol Commun*. 2020 Oct 28;8(1):173. doi: 10.1186/s40478-020-01038-w. PMID: 33115534; PMCID: PMC7592366.

6. Saunders CN, Cornish AJ, Kinnersley B, Law PJ, Houlston RS; Collaborators. Searching for causal relationships of glioma: a phenome-wide Mendelian randomisation study. *Br J Cancer*. 2021 Jan;124(2):447-454. doi: 10.1038/s41416-020-01083-1. PMID: 33020596; PMCID: PMC7852872.
7. Patro CPK, Noursome D; Glioma International Case Control Study (GICC); Lai RK. Meta-Analyses of Splicing and Expression Quantitative Trait Loci Identified Susceptibility Genes of Glioma. *Front Genet*. 2021 Apr 15;12:609657. doi: 10.3389/fgene.2021.609657. PMID: 33936159; PMCID: PMC8081720.
8. Ostrom QT, Edelson J, Byun J, Han Y, Kinnersley B, Melin B, Houlston RS, Monje M; GLIOGENE Consortium; Walsh KM, Amos CI, Bondy ML. Partitioned glioma heritability shows subtype-specific enrichment in immune cells. *Neuro Oncol*. 2021 Aug 2;23(8):1304-1314. doi: 10.1093/neuonc/noab072. PMID: 33743008; PMCID: PMC8328033.
9. Grady CB, Claus EB, Bunn DA, Pagliaro JA, Lichtman JH, Bhatt AB. Disparities in patient engagement with video telemedicine among high-video-use providers during the COVID-19 pandemic. *Eur Heart J Digit Health*. 2021 Jul 27;2(4):691-694. doi: 10.1093/ehjdh/ztab067. PMID: 36713094; PMCID: PMC8344537.
10. Claus EB, Cannataro VL, Gaffney SG, Townsend JP. Environmental and sex-specific molecular signatures of glioma causation. *Neuro Oncol*. 2022 Jan 5;24(1):29-36. doi: 10.1093/neuonc/noab103. Erratum in: *Neuro Oncol*. 2022 Nov 2;24(11):2012. PMID: 33942853; PMCID: PMC8730771.
11. Walsh KM, Zhang C, Calvocoressi L, Hansen HM, Berchuck A, Schildkraut JM, Bondy ML, Wrensch M, Wiemels JL, Claus EB. Pleiotropic MLLT10 variation confers risk of meningioma and estrogen-mediated cancers. *Neurooncol Adv*. 2022 Apr 15;4(1). doi: 10.1093/noajnl/vdac044. PMID: 35702670; PMCID: PMC9187056.
12. Driver J, Hoffman SE, Tavakol S, Woodward E, Maury EA, Bhave V, Greenwald NF, Nassiri F, Aldape K, Zadeh G, Choudhury A, Vasudevan HN, Magill ST, Raleigh DR, Abedalthagafi M, Aizer AA, Alexander BM, Ligon KL, Reardon DA, Wen PY, Al-Mefty O, Ligon AH, Dubuc AM, Beroukhi R, Claus EB, Dunn IF, Santagata S, Bi WL. A molecularly integrated grade for meningioma. *Neuro Oncol*. 2022 May 4;24(5):796-808. doi: 10.1093/neuonc/noab213. PMID: 34508644; PMCID: PMC9071299.
13. Schuster AL, Crossnohere NL, Bachini M, Blair CK, Carpten JD, Claus EB, Colditz GA, Ding L, Drake BF, Fields RC, Janeway KA, Kwan BM, Lenz HJ, Ma Q, Mishra SI, Paskett ED, Rebbeck TR, Ricker C, Stern MC, Sussman AL, Tiner JC, Trent JM, Verhaak RG, Wagle N, Willman C, Bridges JF; Participant Engagement and Cancer Genome Sequencing (PE-CGS) Network. Priorities to Promote Participant Engagement in the Participant Engagement and Cancer Genome Sequencing (PE-CGS) Network. *Cancer Epidemiol Biomarkers Prev*. 2023 Apr 3;32(4):487-495. doi: 10.1158/1055-9965.EPI-22-0356. PMID: 36791345; PMCID: PMC10068438.
14. Choi DJ, Armstrong G, Lozzi B, Vijayaraghavan P, Plon SE, Wong TC, Boerwinkle E, Muzny DM, Chen HC, Gibbs RA, Ostrom QT, Melin B, Deneen B, Bondy ML; Gliogene Consortium; Genomics England Research Consortium; Bainbridge MN, Amos CI, Barnholtz-Sloan JS, Bernstein JL, Claus EB, Houlston RS, Il'yasova D, Jenkins RB, Johansen C, Lachance D, Lai R, Melin BS, Merrell RT, Olson SH, Sadetzki S, Schildkraut J, Shete S, Ambrose JC, Arumugam P, Bevers R, Bleda M, Boardman-Pretty F, Boustred CR, Brittain H, Brown MA, Caulfield MJ, Chan GC, Giess A, Griffin JN, Hamblin A, Henderson S, Hubbard TJP, Jackson R, Jones LJ, Kasperaviciute D, Kaykci M, Kousathanas A, Lahnstein L, Lakey A, Leigh SEA, Leong IUS, Lopez FJ, Maleady-Crowe F, McEntagart M, Minnici F, Mitchell J, Moutsianas L, Mueller M, Murugaesu N, Need AC, O'Donovan P, Odhams CA, Patch C, Perez-Gil D, Pereira MB, Pullinger J, Rahim T, Rendon A, Rogers T, Savage K, Sawant K, Scott RH, Siddiq A, Sieghart A, Smith SC, Sosinsky A, Stuckey A, Tanguy M, Taylor Tavares AL, Thomas ERA, Thompson SR, Tucci A, Welland MJ, Williams E, Witkowska K, Wood SM, Zarowiecki M. The genomic landscape of familial glioma. *Sci Adv*. 2023 Apr 28;9(17). doi: 10.1126/sciadv.ade2675. PMID: 37115922; PMCID: PMC10146888.
15. Haycock PC, Borges MC, Burrows K, Lemaitre RN, Burgess S, Khankari NK, Tsilidis KK, Gaunt TR, Hemani G, Zheng J, Truong T, Birman BM, OMara T, Spurdle AB, Iles MM, Law MH, Slager SL, Saberi Hosnijeh F, Mariosa D, Cotterchio M, Cerhan JR, Peters U, Enroth S, Gharahkhani P, Le Marchand L, Williams AC, Block RC; ACCC; CCFR-CORECT-GECCO; EPITHYR; InterLymph; MMAC; ECAC; ILCCO; PRACTICAL Consortium; PanScan; PanC4; Amos CI, Hung RJ, Zheng W, Gunter MJ, Smith GD, Relton C, Martin RM; Fatty Acids in Cancer Mendelian Randomization Collaboration. The association between genetically elevated polyunsaturated fatty acids and risk of cancer. *EBioMedicine*. 2023 May;91:104510. doi: 10.1016/j.ebiom.2023.104510. PMID: 37086649; PMCID: PMC10148095.
16. Claus EB, Verhaak RGW. Targeting IDH in Low-Grade Glioma. *N Engl J Med*. 2023 Aug 17;389(7):655-659. doi: 10.1056/NEJMe2305602. PMID: 37585633.
17. Miyagishima DF, Sundaresan V, Gutierrez AG, Barak T, Yeung J, Moliterno J, McGuone D, Claus EB, Günel M. A systematic review and individual participant data meta-analysis of gonadal steroid hormone receptors in meningioma. *J Neurosurg*. 2023 May 26;139(6):1638-1647. doi: 10.3171/2023.3.JNS221838. PMID: 37243565; PMCID: PMC10226381.
18. Heffernan AE, Wu Y, Benz LS, Verhaak RGW, Kwan BM, Claus EB. Quality of life after surgery for lower grade gliomas. *Cancer*. 2023 Dec 1;129(23):3761-3771. doi: 10.1002/cncr.34980. PMID: 37599093; PMCID: PMC10872908.
19. He Q, Wang W, Ma J; GLIOGENE Consortium. Length of phone use and glioma risk: a Mendelian randomization study. *Int J Surg*. 2024 Aug 1;110(8):5254-5255. doi: 10.1097/JS9.0000000000001563. PMID: 39143715; PMCID: PMC11326033.
20. Venkataraman V, Martin-Giacalone BA, Drake BF, Salmi L, Claus EB, Schuster ALR, Bridges JFP, Lenz HJ, Willman CL, Diehl D, Janeway KA, Mack JW, George S. Overcoming Systemic Barriers to Make Patient-Partnered Research a Reality. *J Clin Oncol*. 2024 Aug 2. doi: 10.1200/JCO.24.00347. PMID: 39094073.





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PUBLICATIONS

1. Park YS, Cosgrove GR, Madsen JR, Eskandar EN, Hochberg LR, Cash SS, Truccolo W. Early Detection of Human Epileptic Seizures Based on Intracortical Microelectrode Array Signals. *IEEE Trans Biomed Eng.* 2020 Mar;67(3):817-831. doi: 10.1109/TBME.2019.2921448. PMID: 31180831; PMCID: PMC7067044.
2. Olah M, Menon V, Habib N, Taga MF, Ma Y, Yung CJ, Cimpean M, Khairallah A, Coronas-Samano G, Sankowski R, Grün D, Kroshilina AA, Dionne D, Sarkis RA, Cosgrove GR, Helgager J, Golden JA, Pennell PB, Prinz M, Vonsattel JPG, Teich AF, Schneider JA, Bennett DA, Regev A, Elyaman W, Bradshaw EM, De Jager PL. Single cell RNA sequencing of human microglia uncovers a subset associated with Alzheimer's disease. *Nat Commun.* 2020 Nov 30;11(1):6129. doi: 10.1038/s41467-020-19737-2. PMID: 33257666; PMCID: PMC7704703.
3. Zelmann R, Paulk AC, Basu I, Sarma A, Yousefi A, Crocker B, Eskandar E, Williams Z, Cosgrove GR, Weisholtz DS, Dougherty DD, Truccolo W, Widge AS, Cash SS. CLoSES: A platform for closed-loop intracranial stimulation in humans. *Neuroimage.* 2020 Dec;223:117314. doi: 10.1016/j.neuroimage.2020.117314. PMID: 32882382; PMCID: PMC7805582.
4. Paulk AC, Yang JC, Cleary DR, Soper DJ, Halgren M, O'Donnell AR, Lee SH, Ganji M, Ro YG, Oh H, Hossain L, Lee J, Tchoe Y, Rogers N, Kiliç K, Ryu SB, Lee SW, Hermiz J, Gilja V, Ulbert I, Fabó D, Thesen T, Doyle WK, Devinsky O, Madsen JR, Schomer DL, Eskandar EN, Lee JW, Maus D, Devor A, Fried SI, Jones PS, Nahed BV, Ben-Haim S, Bick SK, Richardson RM, Raslan AM, Siler DA, Cahill DP, Williams ZM, Cosgrove GR, Dayeh SA, Cash SS. Microscale Physiological Events on the Human Cortical Surface. *Cereb Cortex.* 2021 Jul 5;31(8):3678-3700. doi: 10.1093/cercor/bhab040. PMID: 33749727; PMCID: PMC8258438.
5. Eisenberg HM, Krishna V, Elias WJ, Cosgrove GR, Gandhi D, Aldrich CE, Fishman PS. MR-guided focused ultrasound pallidotomy for Parkinson's disease: safety and feasibility. *J Neurosurg.* 2020 Nov 27;135(3):792-798. doi: 10.3171/2020.6.JNS192773. PMID: 33481557.
6. Yang JC, Paulk AC, Salami P, Lee SH, Ganji M, Soper DJ, Cleary D, Simon M, Maus D, Lee JW, Nahed BV, Jones PS, Cahill DP, Cosgrove GR, Chu CJ, Williams Z, Halgren E, Dayeh S, Cash SS. Microscale dynamics of electrophysiological markers of epilepsy. *Clin Neurophysiol.* 2021 Nov;132(11):2916-2931. doi: 10.1016/j.clinph.2021.06.024. PMID: 34419344; PMCID: PMC8545846.
7. Segar DJ, Lak AM, Lee S, Harary M, Chavakula V, Lauro P, McDannold N, White J, Cosgrove GR. Lesion location and lesion creation affect outcomes after focused ultrasound thalamotomy. *Brain.* 2021 Nov 29;144(10):3089-3100. doi: 10.1093/brain/awab176. PMID: 34750621.
8. Beaulieu-Laroche L, Brown NJ, Hansen M, Toloza EHS, Sharma J, Williams ZM, Frosch MP, Cosgrove GR, Cash SS, Harnett MT. Allometric rules for mammalian cortical layer 5 neuron biophysics. *Nature.* 2021 Dec;600(7888):274-278. doi: 10.1038/s41586-021-04072-3. PMID: 34759318; PMCID: PMC8665137.
9. Bernstock JD, Torio EF, Raghu ALB, Chua M, Chen JA, Segar D, Gupta S, White PJ, McDannold N, Golby AJ, Cosgrove GR. Transcranial MR-Guided Focused Ultrasound and Hyperostosis Calvariae Diffusa: Case Report and Systematic Review of the Literature. *Stereotact Funct Neurosurg.* 2022;100(5-6):331-339. doi: 10.1159/000527232. PMID: 36521432.
10. Lak AM, Segar DJ, McDannold N, White PJ, Cosgrove GR. Magnetic Resonance Image Guided Focused Ultrasound Thalamotomy. A Single Center Experience With 160 Procedures. *Front Neurol.* 2022 Feb 18;13:743649. doi: 10.3389/fneur.2022.743649. PMID: 35250802; PMCID: PMC8894664.
11. Segar DJ, Tata N, Harary M, Hayes MT, Cosgrove GR. Asleep deep brain stimulation with intraoperative magnetic resonance guidance: a single-institution experience. *J Neurosurg.* 2021 Aug 6;136(3):699-708. doi: 10.3171/2020.12.JNS202572. PMID: 34359029.
12. Bublick EJ, Gholipour T, Hibert M, Cosgrove GR, Stuffelbeam SM, Young GS. 7T versus 3T MRI in the presurgical evaluation of patients with drug-resistant epilepsy. *J Neuroimaging.* 2022 Mar;32(2):292-299. doi: 10.1111/jon.12958. Epub 2021 Dec 29. PMID: 34964194.
13. Paulk AC, Zelmann R, Crocker B, Widge AS, Dougherty DD, Eskandar EN, Weisholtz DS, Richardson RM, Cosgrove GR, Williams ZM, Cash SS. Local and distant cortical responses to single pulse intracranial stimulation in the human brain are differentially modulated by specific stimulation parameters. *Brain Stimul.* 2022 Mar-Apr;15(2):491-508. doi: 10.1016/j.brs.2022.02.017. Epub 2022 Mar 2. PMID: 35247646; PMCID: PMC8985164.
14. Mastroph ML, Cosgrove GR, Williams ZM. The Evolution of Modern Ablative Surgery for the Treatment of Obsessive-Compulsive and Major Depression Disorders. *Front Integr Neurosci.* 2022 Apr 6;16:797533. doi: 10.3389/fnint.2022.797533. PMID: 35464603; PMCID: PMC9026193.
15. Pujol S, Cabeen RP, Yelnik J, François C, Fernandez Vidal S, Karachi C, Bardinet E, Cosgrove GR, Kikinis R. Somatotopic Organization of Hyperdirect Pathway Projections From the Primary Motor Cortex in the Human Brain. *Front Neurol.* 2022 Apr 25;13:791092. doi: 10.3389/fneur.2022.791092. PMID: 35547388; PMCID: PMC9081715.
16. Yan H, Elkaim LM, Venetucci Gouveia F, Huber JF, Germann J, Loh A, Benedetti-Isaac JC, Doshi PK, Torres CV, Segar DJ, Elias GJB, Boutet A, Cosgrove GR, Fasano A, Lozano AM, Kulkarni AV, Ibrahim GM. Deep brain stimulation for extreme behaviors associated with autism spectrum disorder converges on a common pathway: a systematic review and connectomic analysis. *J Neurosurg.* 2022 Jan 21;137(3):699-708. doi: 10.3171/2021.11.JNS21928. PMID: 35061980.
17. Yearley AG, Ng PR, Gupta S, Cosgrove GR, Mooney MA. Utility of a Pilot Neurosurgical Operative Skills Boot Camp in Medical Student Training. *World Neurosurg.* 2022 Oct;166. doi: 10.1016/j.wneu.2022.07.065. Epub 2022 Jul 20. PMID: 35870784.
18. Lai PMR, Ryu JY, Park SC, Gross BA, Dickinson LD, Dagen S, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Blackburn S, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Frerichs KU, Niemela M, Ojemann SG, Patel NJ, Shi X, Valle-Giler EP, Wang AC, Welch BG, Zusman EE, Weiss ST, Du R. Somatic Variants in SVIL in Cerebral Aneurysms. *Neurol Genet.* 2022 Nov 28;8(6). doi: 10.1212/NXG.0000000000200040. PMID: 36475054; PMCID: PMC9720733.
19. Hariz M, Lang AE, Bronstein JM, Cosgrove GR, de Bie RMA, DeLong MR, Gross RE, Krack P, Krauss JK, Lees AJ, Lozano AM, Obeso JA, Schuurman PR, Vitek JL. WITHDRAWN: European Academy of Neurology/Movement Disorder Society European Section's guidelines on pallidotomy for Parkinson's disease: let's remain accurate. *Eur J Neurol.* 2022 Dec 30. doi: 10.1111/ene.15667. Epub ahead of print. PMID: 36583626.
20. Blitz SE, Torre M, Chua MMJ, Christie SL, McDannold NJ, Cosgrove GR. Focused Ultrasound Thalamotomy: Correlation of Postoperative Imaging with Neuropathological Findings. *Stereotact Funct Neurosurg.* 2023;101(1):60-67. doi: 10.1159/000527269. Epub 2023 Jan 25. PMID: 36696893; PMCID: PMC9981195.
21. Chua MMJ, Warren AEL, Cosgrove GR, Rolston JD. Publication Rates and Characteristics of Clinical Trials in Deep Brain and Responsive Neurostimulation. *Stereotact Funct Neurosurg.* 2023;101(5):287-300. doi: 10.1159/000531161. Epub 2023 Aug 8. PMID: 37552969.

22. Xiao Y, Chou CC, Cosgrove GR, Crone NE, Stone S, Madsen JR, Reucroft I, Shih YC, Weisholtz D, Yu HY, Anderson WS, Kreiman G. Cross-task specificity and within-task invariance of cognitive control processes. *Cell Rep.* 2023 Jan 31;42(1):111919. doi: 10.1016/j.celrep.2022.111919. Epub 2023 Jan 10. PMID: 36640346; PMCID: PMC9993332.
23. Sheth SA, Cosgrove GR, McLaughlin NCR. Introduction. *Neurosurgical neuroscience. Neurosurg Focus.* 2023 Feb;54(2). doi: 10.3171/2022.11.FOCUS22621. PMID: 36724518.
24. Hariz M, Bronstein JM, Cosgrove GR, de Bie RMA, DeLong MR, Gross RE, Krack P, Krauss JK, Lang AE, Lees AJ, Lozano AM, Obeso JA, Schuurman PR, Vitek JL. Concerns About the European Academy's Recommendations and Guidelines Regarding Pallidotomy for Parkinson's Disease. *Mov Disord.* 2023 Mar;38(3):509-511. doi: 10.1002/mds.29210. Epub 2022 Sep 1. PMID: 36047463.
25. Vardalaki D, Pham TLD, Frosch MP, Cosgrove GR, Richardson M, Cash SS, Harnett MT. Patch2MAP combines patch-clamp electrophysiology with super-resolution structural and protein imaging in identified single neurons without genetic modification. *bioRxiv [Preprint].* 2023 Mar 21:2023.03.20.533452. doi: 10.1101/2023.03.20.533452. PMID: 36993722; PMCID: PMC10055279.
26. Tian F, Lewis LD, Zhou DW, Balanza GA, Paulk AC, Zelmann R, Peled N, Soper D, Santa Cruz Mercado LA, Peterfreund RA, Aglio LS, Eskandar EN, Cosgrove GR, Williams ZM, Richardson RM, Brown EN, Akeju O, Cash SS, Purdon PL. Characterizing brain dynamics during ketamine-induced dissociation and subsequent interactions with propofol using human intracranial neurophysiology. *Nat Commun.* 2023 Mar 29;14(1):1748. doi: 10.1038/s41467-023-37463-3. PMID: 36991011; PMCID: PMC10060225.
27. Basu I, Yousefi A, Crocker B, Zelmann R, Paulk AC, Peled N, Ellard KK, Weisholtz DS, Cosgrove GR, Deckersbach T, Eden UT, Eskandar EN, Dougherty DD, Cash SS, Widge AS. Closed-loop enhancement and neural decoding of cognitive control in humans. *Nat Biomed Eng.* 2023 Apr;7(4):576-588. doi: 10.1038/s41551-021-00804-y. Epub 2021 Nov 1. PMID: 34725508; PMCID: PMC9056584.
28. Cosgrove GR, Lipsman N, Lozano AM, Chang JW, Halpern C, Ghanouni P, Eisenberg H, Fishman P, Taira T, Schwartz ML, McDannold N, Hayes M, Ro S, Shah B, Gwinn R, Santini VE, Hynynen K, Elias WJ. Magnetic resonance imaging-guided focused ultrasound thalamotomy for essential tremor: 5-year follow-up results. *J Neurosurg.* 2022 Aug 5;138(4):1028-1033. doi: 10.3171/2022.6.JNS212483. PMID: 35932269; PMCID: PMC10193464.
29. Bhave VM, Bernstock JD, Carlson JM, Kappel AD, Torio EF, Chen JA, Essayed W, Gawelek KL, DiToro DF, Izzy S, Cosgrove GR. Surgical Management in Herpes Simplex Encephalitis: Illustrative Case Report and Systematic Review of the Literature. *Neurosurgery.* 2023 May 1;92(5):915-933. doi: 10.1227/neu.0000000000002334. Epub 2023 Jan 19. PMID: 36700784.
30. Asher R, Hyun I, Head M, Cosgrove GR, Silbersweig D. Neuroethical implications of focused ultrasound for neuropsychiatric illness. *Brain Stimul.* 2023 May-Jun;16(3):806-814. doi: 10.1016/j.brs.2023.04.020. Epub 2023 May 5. PMID: 37150289.
31. Hariz M, Bronstein JM, Cosgrove GR, de Bie RMA, DeLong MR, Gross RE, Krack P, Krauss JK, Lang AE, Lees AJ, Lozano AM, Obeso JA, Schuurman PR, Vitek JL. Concerns about the European Academy's Recommendations and Guidelines Regarding Pallidotomy for Parkinson's Disease. *Eur J Neurol.* 2023 Jun;30(6):1831-1833. doi: 10.1111/ene.15569. Epub 2022 Oct 1. PMID: 36128760.
32. Yearley AG, Patel RV, Rachlin JR, Gupta S, King JT Jr, Cosgrove GR, Mooney MA. Integration of Veterans Affairs Medical Centers Into Neurosurgical Residency Programs. *Neurosurgery.* 2023 Jun 1;92(6). doi: 10.1227/neu.0000000000002362. Epub 2023 Jan 16. PMID: 36728276.
33. Michalak AJ, Greenblatt A, Wu S, Tobochnik S, Dave H, Raghupathi R, Esengul YT, Guerra A, Tao JX, Issa NP, Cosgrove GR, Lega B, Warnke P, Chen HI, Lucas T, Sheth SA, Banks GP, Kwon CS, Feldstein N, Youngerman B, McKhann G, Davis KA, Schevon CA. Seizure onset patterns predict outcome after stereo-electroencephalography-guided laser amygdalohippocampotomy. *Epilepsia.* 2023 Jun;64(6):1568-1581. doi: 10.1111/epi.17602. Epub 2023 Apr 24. PMID: 37013668; PMCID: PMC10247471.
34. Joutsa J, Lipsman N, Horn A, Cosgrove GR, Fox MD. The return of the lesion for localization and therapy. *Brain.* 2023 Aug 1;146(8):3146-3155. doi: 10.1093/brain/awad123. PMID: 37040563; PMCID: PMC10393408.
35. Chua MMJ, Vissani M, Liu DD, Schaper FLWVJ, Warren AEL, Caston R, Dworetzky BA, Bubrick EJ, Sarkis RA, Cosgrove GR, Rolston JD. Initial case series of a novel sensing deep brain stimulation device in drug-resistant epilepsy and consistent identification of alpha/beta oscillatory activity: A feasibility study. *Epilepsia.* 2023 Oct;64(10):2586-2603. doi: 10.1111/epi.17722. Epub 2023 Jul 28. PMID: 37483140.
36. Chua MMJ, Blitz SE, Ng PR, Segar DJ, McDannold NJ, White PJ, Christie S, Hayes MT, Rolston JD, Cosgrove GR. Focused Ultrasound Thalamotomy for Tremor in Parkinson's Disease: Outcomes in a Large, Prospective Cohort. *Mov Disord.* 2023 Oct;38(10):1962-1967. doi: 10.1002/mds.29569. Epub 2023 Aug 4. PMID: 37539721.
37. Blitz SE, Chua MMJ, Ng P, Segar DJ, Jha R, McDannold NJ, DeSalvo MN, Rolston JD, Cosgrove GR. Longitudinal MR imaging after unilateral MR-guided focused ultrasound thalamotomy: clinical and radiological correlation. *Front Neurol.* 2023 Oct 6;14:1272425. doi: 10.3389/fneur.2023.1272425. PMID: 37869137; PMCID: PMC10587555.
38. Yearley AG, Chua M, Horn A, Cosgrove GR, Rolston JD. Deep Brain Stimulation Lead Localization Variability Comparing Intraoperative MRI Versus Postoperative Computed Tomography. *Oper Neurosurg (Hagerstown).* 2023 Nov 1;25(5):441-448. doi: 10.1227/ons.0000000000000849. Epub 2023 Aug 16. PMID: 37584483.
39. Zelmann R, Paulk AC, Tian F, Balanza Villegas GA, Dezha Peralta J, Crocker B, Cosgrove GR, Richardson RM, Williams ZM, Dougherty DD, Purdon PL, Cash SS. Differential cortical network engagement during states of un/consciousness in humans. *Neuron.* 2023 Nov 1;111(21):3479-3495.e6. doi: 10.1016/j.neuron.2023.08.007. Epub 2023 Sep 1. PMID: 37659409; PMCID: PMC10843836.
40. Banko L, Patel RV, Nawabi N, Altshuler M, Medeiros L, Cosgrove GR, Bi WL. Strategies to improve surgical technical competency: a systematic review. *Acta Neurochir (Wien).* 2023 Dec;165(12):3565-3572. doi: 10.1007/s00701-023-05868-0. Epub 2023 Nov 10. PMID: 37945995.
41. Neudorfer C, Kultas-Ilinsky K, Ilinsky I, Paschen S, Helmers AK, Cosgrove GR, Richardson RM, Horn A, Deuschl G. The role of the motor thalamus in deep brain stimulation for essential tremor. *Neurotherapeutics.* 2024 Apr;21(3). doi: 10.1016/j.neurot.2023.e00313. Epub 2024 Jan 8. PMID: 38195310; PMCID: PMC11103222.
42. Ng PR, Blitz SE, Chua MMJ, Cosgrove GR. Magnetic resonance-guided focused ultrasound thalamotomy for essential tremor patients with low skull density ratio: a case-matched analysis. *Front Neurol.* 2024 Apr 22;15:1370574. doi: 10.3389/fneur.2024.1370574. PMID: 38711556; PMCID: PMC11071343.
43. Meyer GM, Hollunder B, Li N, Butenko K, Dembek TA, Hart L, Nombela C, Mosley P, Akram H, Acevedo N, Borrón BM, Chou T, Castaño Montoya JP, Strange B, Barcia JA, Tyagi H, Castle DJ, Smith AH, Choi KS, Kopell BH, Mayberg HS, Sheth SA, Goodman WK, Leentjens AFG, Richardson RM, Rossell SL, Bosanac P, Cosgrove GR, Kuhn J, Visser-Vandewalle V, Figeo M, Dougherty DD, Siddiqi SH, Zrinzo L, Joyce E, Baldermann JC, Fox MD, Neudorfer C, Horn A. Deep Brain Stimulation for Obsessive-Compulsive Disorder: Optimal Stimulation Sites. *Biol Psychiatry.* 2024 Jul 15;96(2):101-113. doi: 10.1016/j.biopsych.2023.12.010. Epub 2023 Dec 21. PMID: 38141909; PMCID: PMC11190041.
44. Jha R, Liu DD, Gerstl JVE, Renauld S, Kilgallon JL, Blitz SE, Medeiros L, Nawabi NLA, Singh H, Chua MMJ, Tobochnik S, Cosgrove GR, Rolston JD. Comparative effectiveness of stereotactic, subdural, or hybrid intracranial EEG monitoring in epilepsy surgery. *J Neurosurg.* 2024 Mar 8;141(2):372-380. doi: 10.3171/2024.1.JNS232560. PMID: 38457804.
45. Jha R, Chua MMJ, Liu DD, Cosgrove GR, Tobochnik S, Rolston JD. Characterization of anti-seizure medication reduction and discontinuation rates following epilepsy surgery. *Epilepsy Behav.* 2024 Sep;158:109944. doi: 10.1016/j.yebeh.2024.109944. Epub 2024 Jul 13. PMID: 39002278.
46. Chua MMJ, LeBlang S, Powlovich L, Gilbertson T, Krishna V, Guttmann CRG, Eames MDC, Poulsen FR, Cosgrove GR. Brain targeting for focused ultrasound essential tremor ablation: proceedings from the 2023 Focused Ultrasound Foundation workshop. *Neurosurg Focus.* 2024 Sep 1;57(3). doi: 10.3171/2024.6.FOCUS2494. PMID: 39217630.
47. Chen JA, White PJ, Cosgrove GR, Rolston JD. Magnetic resonance-guided focused ultrasound thalamotomy for tremor. *Neurosurg Focus Video.* 2024 Oct 1;11(2). doi: 10.3171/2024.7.FOCUS249. PMID: 39399522; PMCID: PMC11469476.
48. Filo J, Mustroph ML, Chua MMJ, White PJ, McDannold NJ, Cosgrove GR. Magnetic Resonance-Guided Focused Ultrasound Thalamotomy for Essential Tremor in Fahr's Disease: Case Report. *Stereotact Funct Neurosurg.* 2024 Oct 21:1-6. doi: 10.1159/000541446. Epub ahead of print. PMID: 39433031.
49. Jha R, Wadhwa A, Chua MMJ, Cosgrove GR, Rolston JD. Tremor Severity and Operative Parameters Predict Imbalance in Patients Undergoing Focused Ultrasound Thalamotomy. *Mov Disord Clin Pract.* 2024 Oct 25. doi: 10.1002/mdc3.14237. Epub ahead of print. PMID: 39450579.
50. Zhang J, Ryu JY, Tirado SR, Dickinson LD, Abosch A, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Binyamin TR, Blackburn SL, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Folkerth RD, Frerichs KU, Howard BM, Jahromi BR, Niemela M, Ojemann SG, Patel NJ, Richardson RM, Shi X, Valle-Giler EP, Wang AC, Welch BG, Williams Z, Zusman EE, Weiss ST, Du R; GENIE Investigators. A Transcriptomic Comparative Study of Cranial Vasculature. *Transl Stroke Res.* 2024 Dec;15(6):1108-1122. doi: 10.1007/s12975-023-01186-w. Epub 2023 Aug 23. PMID: 37612482.



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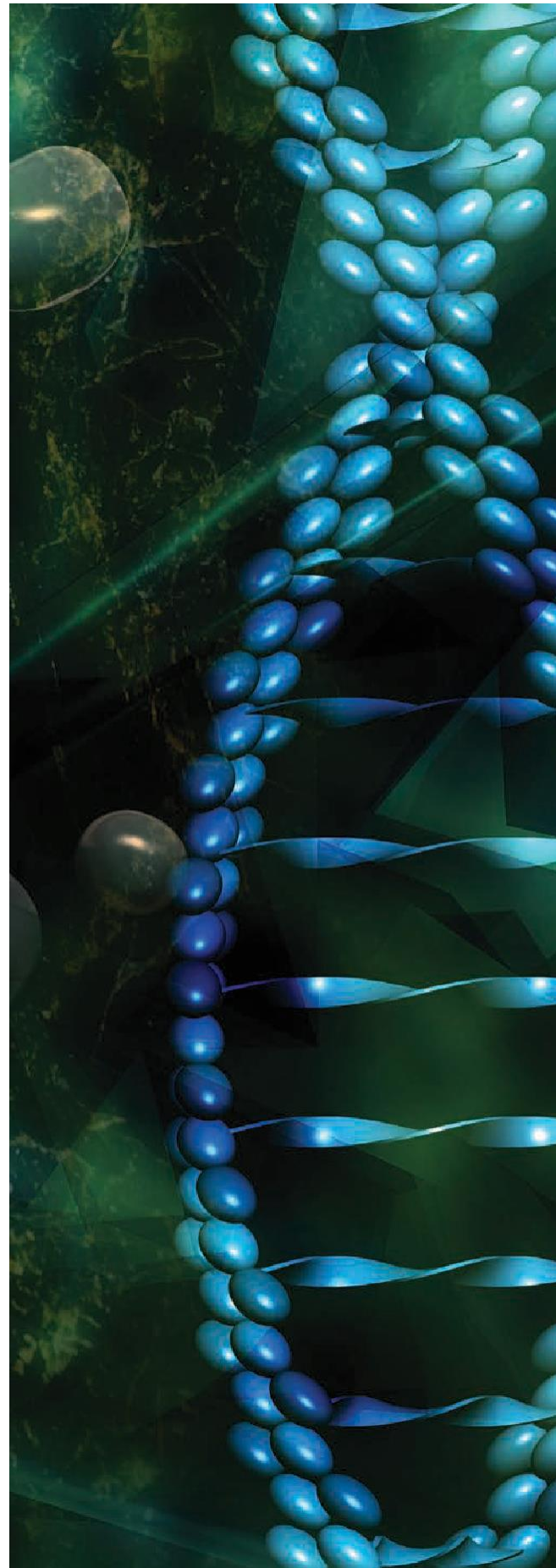
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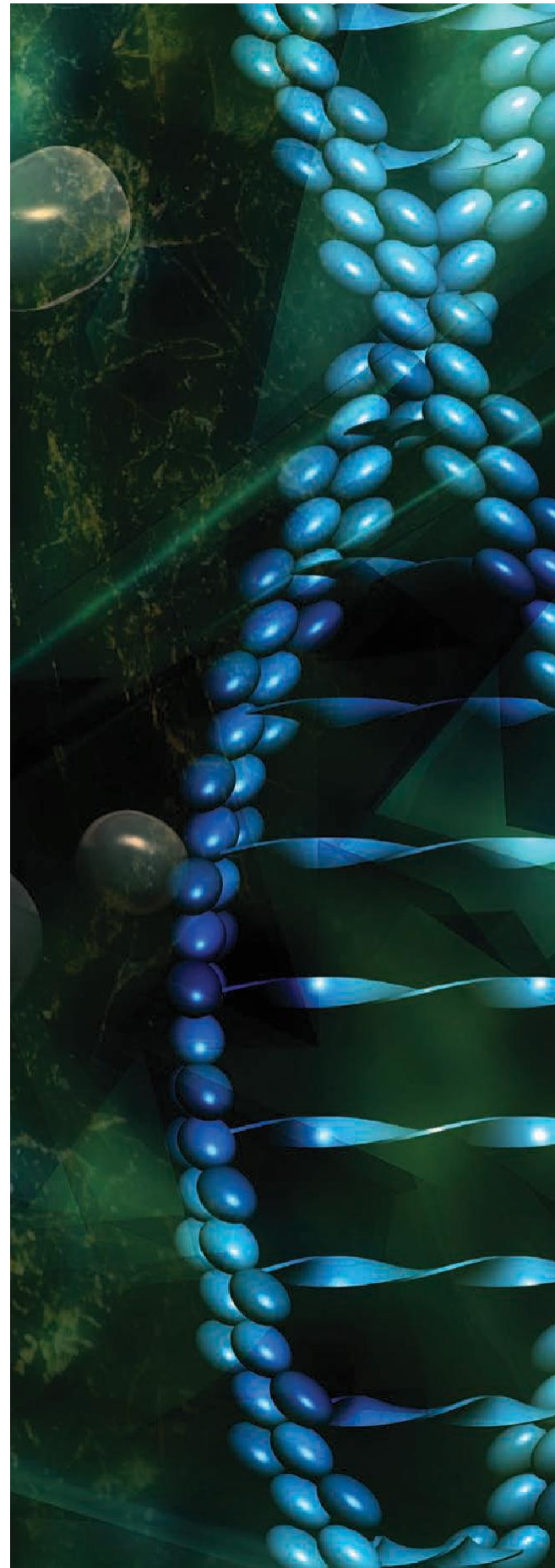
PUBLICATIONS

1. Ng I and Du R. Thirty-day readmissions in aneurysmal subarachnoid hemorrhage: a good metric for hospital quality? *J Neurosci Res*, 98:219-226, 2020.
2. Cerecedo-Lopez CD, Cantu-Aldana A, Patel NJ, Azi Sultan MA, Frerichs KU, and Du R. Insulin in the management of acute ischemic stroke: A systematic review and meta-analysis, *World Neurosurgery*, 136:e514-534, 2020.
3. Lai PMR, Ng I, Gormley WB, Patel NJ, Frerichs KU, Aziz-Sultan MA, and Du R. Familial predisposition and differences in radiographic patterns in spontaneous non-aneurysmal subarachnoid hemorrhage, *Neurosurgery*, 88:413-419, 2021.
4. Caton Jr. MT, Zamani AA, Du R, and Prasad S. Optic neuropathy due to compression by an ectatic internal carotid artery within the orbital apex, *J Neuroophthalmol*, 41:e103-e104, 2021.
5. Zhang J, Can A, Lai PMR, Mukundan S, Castro VM, Dligach D, Finan S, Yu S, Gainer V, Shadick NA, Savova G, Murphy S, Cai T, Weiss ST, and Du R. Age and geometric parameters of ruptured and unruptured posterior communicating artery aneurysms, *Sci Reports*, 10:11545, 2020.
6. Lai PMR and Du R. Return to driving is a better predictor of patient outcome than return to work after aneurysmal subarachnoid hemorrhage, *World Neurosurgery*, 144:e285-295, 2020.
7. Zhang J*, Can A*, Lai PMR, Mukundan S, Castro VM, Dligach D, Finan S, Gainer VS, Shadick NA, Savova G, Murphn SN, Cai T, Weiss ST, and Du R. Vascular geometry associated with anterior communicating artery aneurysm formation, *World Neurosurgery*, 146:e1318-1325, 2021. *These authors contributed equally.
8. Lai PMR and Du R. Return to driving is a better predictor of patient outcome than return to work after aneurysmal subarachnoid hemorrhage, *World Neurosurgery*, 144:e285-295, 2020.
9. Zhang J*, Can A*, Lai PMR, Mukundan S, Castro VM, Dligach D, Finan S, Gainer VS, Shadick NA, Savova G, Murphn SN, Cai T, Weiss ST, and Du R. Vascular geometry associated with anterior communicating artery aneurysm formation, *World Neurosurgery*, 146:e1318-1325, 2021. *These authors contributed equally.

10. Lai PMR and Du R. Return to driving is a better predictor of patient outcome than return to work after aneurysmal subarachnoid hemorrhage, *World Neurosurgery*, 144:e285-295, 2020.
11. Zhang J*, Can A*, Lai PMR, Mukundan S, Castro VM, Dligach D, Finan S, Gainer VS, Shadick NA, Savova G, Murphn SN, Cai T, Weiss ST, and Du R. Vascular geometry associated with anterior communicating artery aneurysm formation, *World Neurosurgery*, 146:e1318-1325, 2021. *These authors contributed equally.
12. Lai PMR, Patel NJ, Frerichs KU, Patel AB, Aziz-Sultan MA, Ogilvy CS, and Du R. Direct vs indirect revascularization in a North American cohort of Moyamoya disease, *Neurosurgery*, 89:315-322, 2021.
13. Zhang J*, Can A*, Lai PMR, Mukundan S, Castro VM, Dligach D, Finan S, Gainer VS, Shadick NA, Savova G, Murphn SN, Cai T, Weiss ST, and Du R. Geometric variations associated with posterior communicating artery aneurysms, *J Neurointerv Surg*, 13:1049-1052, 2021. *These authors contributed equally.
14. Chen CJ, Buell TJ, Ding D, Guniganti R, Kansagra AP, Lanzino G, Brinjikji W, Kim L, Levitt M, Abecassis IJ, Bulters D, Durnford A, Fox WC, Polifka AJ, Gross B, Hayakawa M, Derdeyn C, Samaniego EA, Amin-Hanjani S, Alaraj A, Kwasnicki A, van Dijk JMC, Potgieser ARE, Starke RM, Chen S, Satomi J, Tada Y, Abla A, Phelps R, Du R, Lai R, Zipfel GJ, and Sheehan JP, on behalf of Consortium for Dural Arteriovenous Fistula Outcomes Research. Observation versus intervention for low-grade intracranial dural arteriovenous fistulas, *Neurosurgery*, 88:1111-1120, 2021.
15. Zhang J*, Can A*, Lai PMR, Mukundan S, Castro VM, Dligach D, Finan S, Yu S, Gainer VS, Shadick NA, Savova G, Murphn SN, Cai T, Weiss ST, and Du R. Morphological variables associated with ruptured basilar tip aneurysms, *Scientific Reports*, 11:2526, 2021. *These authors contributed equally.
16. Guniganti R, Giordan E, Chen CJ, Abecassis IJ, Levitt MR, Durnford A, Smith J, Samaniego E, Derdeyn CP, Kwasnicki A, Alaraj A, Potgieser ARE, Sur S, Chen S, Tada Y, Winkler E, Phelps R, Lai R, Du R, Adib Abla, Satomi J, Starke RM, van Dijk JMC, Amin-Hanjani S, Hayakawa M, Gross BA, Fox C, Bulters D, Kim L, Sheehan J, Lanzino G, Piccirillo JF, Kansagra AP, and Zipfel GJ, on behalf of Consortium for Dural Arteriovenous Fistula Outcomes Research. Consortium for Dural Arteriovenous Fistula Outcomes Research (CONDOR): rationale and design, *J Neurosurgery*, 136:951-961, 2021.
17. Samaniego EA, Roa JA, Hayakawa M, Chen CJ, Sheehan JP, Kim L, Abecassis IJ, Levitt M, Guniganti R, Kansagra A, Lanzino G, Giordan E, Brinjikji W, Bulters DO, Durnford A, Fox WC, Polifka AJ, Gross B, Amin-Hanjani S, Alaraj A, Kwasnicki A, Starke RM, Sur S, van Dijk JMC, Potgieser ARE, Satomi J, Tada Y, Abla A, Winkler E, Du R, Lai R, Zipfel GJ, and Derdeyn C, on behalf of Consortium for Dural Arteriovenous Fistula Outcomes Research. Dural arteriovenous fistulas without cortical venous drainage: presentation, treatment and outcomes, *J Neurosurgery*, 136:942-950, 2021.
18. Abecassis IJ, Meyer RM, Levitt MR, Sheehan JP, Chen CJ, Gross BA, Smith J, Fox WC, Giordan E, Lanzino G, Starke RM, Sur S, Potgieser ARE, Van Dijk JMC, Durnford A, Bulters DO, Satomi J, Tada Y, Kwasnicki A, Amin-Hanjani S, Alaraj A, Samaniego EA, Hayakawa M, Derdeyn CP, Winkler E, Abla A, Lai PMR, Du R, Guniganti RR, Kansagra AP, Zipfel GJ, Kim LJ, on behalf of Consortium for Dural Arteriovenous Fistula Outcomes Research. Recurrence after cure in cranial dural arteriovenous fistulae
19. Chen CJ, Buell TJ, Ding D, Guniganti R, Kansagra AP, Lanzino G, Giordan E, Kim LJ, Levitt MR, Abecassis IJ, Bulters DO, Durnford A, Fox WC, Polifka AJ, Gross B, Hayakawa M, Derdeyn CP, Samaniego EA, Amin-Hanjani S, Alaraj A, Kwasnicki A, van Dijk JMC, Potgieser ARE, Starke RM, Sur S, Satomi J, Tada Y, Abla AA, Winkler EA, Du R, Lai R, Zipfel GJ, Sheehan JP, on behalf of Consortium for Dural Arteriovenous Fistula Outcomes Research. Intervention for Unruptured High-Grade Intracranial Dural Arteriovenous Fistulas: A Multicenter Study, *J Neurosurgery*, 136:962-970, 2021.
20. Bernier TD, Schontz M, Izzy S, Chung DY, Leslie-Mazwi B, Henderson GV, Patel N, Aziz-Sultan MA, Du R, Abulhasan YB, and Angle MR. Treatment of subarachnoid hemorrhage-associated delayed cerebral ischemia with milrinone: A review and proposal, *J Neurosurg Anesthesiol*, 33:195-202, 2021.
21. Li Y, Chen S, Guniganti R, Kansagra A, Piccirillo J, Chen CJ, Buell T, Sheehan J, Ding D, Lanzino G, Brinjikji W, Kim L, Levitt M, Abecassis I, Bulters D, Durnford A, Fox WC, Polifka A, Gross B, Sur S, McCarthy D, Yavagal D, Peterson E, Hayakawa M, Derdeyn C, Samaniego E, Amin-Hanjani S, Alaraj A, Kwasnicki A, Charbel F, van Dijk MC, Potgieser A, Satomi J, Tada Y, Abla A, Phelps R, Du R, Lai PMR, Zipfel G, and Starke R. Onyx embolization for dural arteriovenous fistulas: A multi-institutional study, *J Neurointerv Surg*, 14:neurintsurg-2020-017109, 2022.
22. Zhang J*, Lai PMR*, Can A, Mukundan S, Castro VM, Dligach D, Finan S, Gainer VS, Shadick NA, Savova G, Murphy SN, Cai T, Weiss ST, and Du R. Tobacco use and age are associated with different morphologic features of anterior communicating artery aneurysms, *Sci Reports*, 11:4791, 2021. *These authors contributed equally.
23. Yu F, Saand A, Xing C, Lee JW, Hsu L, Palmer O, Jackson V, Tang L, Ning M, Du R, Kochanek P, Lo EH, Chou SHY. CSF lipocalin-2 increase early in subarachnoid hemorrhage are associated with neuroinflammation and unfavorable outcome, *J Cereb Blood Flow Metab*, 41:2524-2533, 2021.
24. Ryu I, Ryu JY, Choe G, Kwon H, Park H, Cho YS, Du R, and Yim S. In vivo plain x-ray imaging of cancer using perovskite quantum dot scintillators, *Adv Funct Mater*, 31:2102334, 2021.
25. Zhang J*, Can A*, Lai PMR, Mukundan S, Castro VM, Dligach D, Finan S, Gainer VS, Shadick NA, Savova G, Murphn SN, Cai T, Weiss ST, and Du R. Surrounding vascular geometry associated with basilar tip aneurysm formation, *Sci Rep*, 10:17928, 2021. *These authors contributed equally.
26. Lak AM, Cerecedo-Lopez CD, Cha J, Aziz-Sultan MA, Frerichs KU, Gormley WB, Mekary RA, Du R, and Patel NJ. Seizure outcomes following interventional treatment in cerebral arteriovenous malformation associated epilepsy: a systematic review and meta-analysis, *World Neurosurgery*, 160:e9-e22, 2022.
27. Gupta S, Vicenty-Padilla J, Lai PMR, Zhou X, Chua M, Bernstock JD, Izzy S, Aziz-Sultan MA, Du R, and Patel NJ. Posterior cerebral artery aneurysm re-rupture following revascularization for moyamoya disease, *J Stroke Cerebrovasc Dis*, 30:106048, 2021.
28. Lai PMR, Caragher S, Patel NJ, Du R, and Aziz-Sultan MA. Safety profile and factors associated with good outcome for endovascularly treated infectious intracranial aneurysms, *Neurosurgery*, 90:233-239, 2022.
29. Cerecedo-Lopez CD, Ng I, Nguyen HB, Lai PMR, Gormley WB, Patel A, Patel NJ, Frerichs KU, Aziz-Sultan MA, and Du R. Incidence and outcomes of registry-based acute myocardial infarction after aneurysmal subarachnoid hemorrhage, *Neurocrit Care*, 36:772-780, 2022.
30. Lai PMR, Ng I, Gormley WB, Patel N, Frerichs KU, Aziz-Sultan MA, and Lai PMR, Ng I, Gormley WB, Patel N, Frerichs KU, Aziz-Sultan MA, and Du R. Cannabis use and increased non-aneurysmal subarachnoid hemorrhage in the last decade, *World Neurosurgery*, 154:e580-e589, 2021.
31. Snider SB*, Migdady I*, LaRose SL, Mckeown ME, Regenhardt RW, Lai PMR, Vaitkevicius H, and Du R. Transcranial-doppler measured vasospasm severity is associated with delayed cerebral infarction after subarachnoid hemorrhage, *Neurocrit Care*, 36:815-821, 2022.
32. Miller LE, Mohan S, Essayed WI, Sukumaran M, Mirshahi S, Rabinov JD, Du R, and Rettig EM. Embolization of the internal maxillary artery via open retrograde superficial temporal artery approach, *J Surg Case Rep*, 2021(11):rjab508, 2021.
33. Haouchine N, Juvekar P, Xiong X, Luo J, Kapur T, Du R, Golby A and Frisken S. Estimation of high framerate digital subtraction angiography sequences at low radiation doses, *Med Image Comput Comput Assist Interv*, 12906:171-180, 2021.
34. Dmytriw AA, Chalif J, Chen J, and Du R. Unilateral Terson syndrome following distal middle cerebral artery aneurysm rupture, *The Neurohospitalist*, 12:422-423, 2022.
35. Zhang J*, Can A*, Lai PMR, Mukundan S, Castro VM, Dligach D, Finan S, Gainer VS, Shadick NA, Savova G, Murphn SN, Cai T, Weiss ST, and Du R. Geometric features associated with middle cerebral artery bifurcation aneurysm formation: A matched case-control study, *J Stroke Cerebrovasc Dis*, 31:106268, 2022. *These authors contributed equally.
36. Lai PMR, Gomez-Paz S, Patel NJ, Frerichs KU, Thomas AJ, Aziz-Sultan MA, Patel AB, Ogilvy CS, and Du R. Asymptomatic moyamoya disease in a North American adult cohort, *World Neurosurgery*, 161:e146-e153, 2022.
37. Lai PMR, Jimenez M, Du R*, and Rexrode K*. Association of reproductive life span and age at menopause with the risk of aneurysmal subarachnoid hemorrhage, *Neurology*, 98:e2005-e2012. *These authors contributed equally.
38. Frisken S, Haouchine N, Du R, and Golby AJ. Using temporal and structural data to reconstruct 3D cerebral vasculature from a pair of 2D digital subtraction angiography sequences, *Comput Med Imaging Graph*, 99:102076, 2022.
39. Adeeb N, Dibas M, Diestro JDB, Phan K, Cuellar-Saenz HH, Sweid A, Lay SV, Guenego A, Aslan A, Renieri L, Sundararajan SH, Saliou G, Möhlenbruch M, Regenhardt RW, Vranic JE, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kuhn AL, Michelozzi C, Elens S, Starke RM, Hassan A, Salehani A, Brehm A, MohammedAli M, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Siddiqui A, Ducruet A, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Stapleton CJ, Boddu S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, Patel AB, Dmytriw AA. Comparing treatment outcomes of various intracranial bifurcation aneurysms locations using Woven EndoBridge (WEB) device, *J Neurointerv Surg*, 15:558-565, 2023.

31. Dmytriw AA, Ghozy S, Sweid A, Piotin M, Bekelis K, Sourour N, Raz E, Vela-Duarte D, Linfante I, Dabus G, Kole M, Martínez-Galdámez M, Nimjee S, Lopes D, Hassan A, Kan P, Ghorbani M, Levitt M, Escalard S, Missios S, Shapiro M, Clarençon F, Elhorany M, Tahir R, Youssef P, Pandey A, Starke R, El Naamani K, Abbas R, Yassin O, Galvan J, Billingsley J, Mortazavi A, Walker M, Dibas M, Settecase F, Heran M, Kuhn A, Puri AS, Menon B, Sivakumar S, Mowla A, D'Amato S, Zha A, Cooke D, Vranic J, Regenhardt R, Rabinov J, Stapleton C, Goyal M, Wu H, Cohen J, Turkel-Parella D, Xavier A, Wagas M, Tutino V, Siddiqui A, Gupta G, Nanda A, Khandelwal P, Tiu C, Cardona P, Pérez de la Ossa N, Urta X, De Lera Alfonso M, Arenillas J, Ribó M, Requena M, Piano M, Pero G, De Sousa K, Al-Mufti F, Hashim Z, Nayak S, Renieri L, Du R, Aziz-Sultan M, Liebeskind D, Nogueira R, Abdalkader M, Nguyen T, Vigilante N, Siegler J E, Grossberg J A, Saad H, Gooch M, Herial N, Rosenwasser R, Tjoumakaris S, Patel A, Tiwari A, Jabbour P. International controlled study of revascularization and outcomes following COVID-positive mechanical thrombectomy, *Eur J Neurol*, 29:3273-3287, 2022.
32. Sanchez S, Raghuram A, Wendt L, Hayakawa M, Chen CJ, Sheehan JP, Kim LJ, Abecassis IJ, Levitt MR, Meyer RM, Jayaraman K, Guniganti R, Kansagra AP, Lanzino G, Giordan E, Bulters D, Durnford A, Fox WC, Smith J, Gross BA, Amin-Hanjani S, Alaraj A, Kwasnicki A, Starke RM, Sur S, van Dijk JMC, Potgieser ARE, Satomi J, Tada Y, Abla A, Winkler E, Du R, Lai PMR, Zipfel GJ, Derdeyn CP, and Samaniego EA. Natural history, angiographic presentation, and outcomes of anterior cranial fossa dural arteriovenous fistula, *J Neurointerv Surg*, epub August 2022.
33. Durnford AJ, Akarca D, Culliford D, Millar J, Guniganti R, Giordan E, Brinjikji W, Chen CJ, Abecassis IJ, Levitt M, Polifka AJ, Derdeyn CP, Samaniego EA, Kwasnicki A, Alaraj A, Potgieser ARE, Chen S, Tada Y, Phelps R, Abla A, Satomi J, Starke RM, van Dijk JMC, Amin-Hanjani S, Hayakawa M, Gross B, Fox WC, Kim L, Sheehan J, Lanzino G, Kansagra AP, Du R, Lai R, Zipfel GJ, Bulters DO on behalf of the CONDOR investigators. The risk of early vs later rebleeding from dural arteriovenous fistulas with cortical venous reflux, *Stroke*, 53:2340-2345, 2022.
34. Lai PR*, Ryu JY*, Park SC*, Gross BA, Dickinson LD, Dagen S, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Blackburn SL, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Frerichs KU, Niemela M, Ojemann SG, Patel NJ, Shi X, Valle-Giler EP, Wang AC, Welch BG, Zusman EE, Weiss ST, Du R; GENIE Investigators. Somatic mutations in SVIL in cerebral aneurysms, *Neurology: Genetics*, epub November 2022. *These authors contributed equally.
35. Das AS, Vicenty-Padilla JC, Chua MMJ, Jeelani Y, Snider SB, Regenhardt RW, Al-Mufti F, Du R, and Izzy S. Cerebrovascular injuries in traumatic brain injury. *Clin Neurol Neurosurg*, epub October 2022.
36. Subat YW, Dasenbrock HH, Gross BA, Patel NJ, Gormley WB, Frerichs KU, Du R, Aziz-Sultan MA, Intracranial hemorrhage after embolization of cerebral arteriovenous malformations: a meta-analysis, *J Neurosurg*, epub Sep 2019.
37. Gerstl JVE, Blitz SE, Qu QR, Yearley AG, Lassarén P, Lindberg R, Gupta S, Kappel AD, Vicenty-Padilla JC, Gaude E, Peruzzotti-Jametti L, Patel NJ, Aziz-Sultan MA, Du R, Smith TR, and Bernstock JD. Global, regional, and national macroeconomic burden of stroke, epub July 2023.
38. Khawaja A, McNulty J, Thakur UV, Chawla S, Devi S, Liew A, Mirshahi S, Du R, Mekary RA, and Gormley W. Transcranial doppler and computed tomography angiography for detecting cerebral vasospasm post-aneurysmal subarachnoid hemorrhage, *Neurosurg Rev*, 46:3, 2022.
39. Schuster PALR, Crossnohere NL, Bachini M, Blair CK, Carpten JD, Claus EB, Colditz GA, Ding L, Drake BF, Fields RC, Janeway KA, Kwan BM, Lenz H, Ma Q, Mishra SI, Paskett ED, Rebbeck TR, Ricker C, Stern MC, Sussman AL, Tiner JC, Trent JM, Verhaak RGW, Wagle N, Willman C, Bridges JFP, and for the Participant Engagement and Cancer Genome Sequencing (PE-CGS) Network. Priorities.
40. Dmytriw AA, Dibas M, Adeeb N, Diestro JDB, Phan K, Cuellar-Saenz HH, Sweid A, Lay SV, Guenego A, Renieri L, Sundararajan SH, Saliou G, Möhlenbruch M, Regenhardt RW, Vranic JE, Lylyk I, Foreman PM, Vachhani JA, Župančić V, Hafeez MU, Rutledge C, Waqas M, Tutino VM, Rabinov JD, Ren Y, Schirmer CM, Piano M, Kühn AL, Michelozzi C, Elens S, Starke RM, Hassan AE, Salehani A, Sporns P, Jones J, Psychogios M, Spears J, Lubicz B, Panni P, Puri AS, Pero G, Griessenauer CJ, Asadi H, Stapleton CJ, Siddiqui A, Ducruet AF, Albuquerque FC, Du R, Kan P, Kalousek V, Lylyk P, Boddu S, Knopman J, Aziz-Sultan MA, Limbucci N, Jabbour P, Cognard C, and Patel AB. The Woven EndoBridge (WEB) device for the treatment of intracranial aneurysms: ten years of lessons learned and adjustments in practice from the WorldWideWEB Consortium, *Trans Stroke Res*, epub Sep 2022.
41. Becerril-Gaitan A, Ding D, Ironside N, Buell TJ, Kansagra AP, Lanzino G, Giordan E, Kim L, Levitt M, Abecassis IJ, Bulters D, Durnford A, Fox WC, Blackburn S, Chen PR, Polifka AJ, Laurent D, Gross B, Hayakawa M, Derdeyn C, Amin-Hanjani S, Alaraj A, van Dijk JMC, Potgieser ARE, Starke RM, Peterson EC, Satomi J, Tada Y, Abla A, Winkler E, Du R, Lai R, Zipfel GJ, Chen CJ, Sheehan JP, on behalf of the Consortium for Dural Arteriovenous Fistula Outcomes Research. The VEBAS score: a practical scoring system for intracranial dural arteriovenous fistula obliteration, *J Neurointerv Surg*, epub May 2023.
42. Ibn Essayed W, Bernstock JD, Chen JA, Ng PR, Kappel A, and Du R. Cavernous venous malformations in and around the central nervous system. Part 2: Intradural cavernous venous malformations, *J Neurosurgery*, accepted.
43. Gonzalez NR, Amin-Hanjani S, Bang OY, Coffey C, Du R, Fierstra J, Fraser JF, Kuroda S, Tietjen GE, Yaghi S; on behalf of the American Heart Association Stroke Council, Council on Cardiovascular and Stroke Nursing, and Council on Clinical Cardiology. AHA Scientific Statement: Adult Moyamoya disease and syndrome: current perspectives and future directions, *Stroke*, accepted.
44. Zhang J, Ryu JY, Tirado S, Dickinson LD, Abosch A, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Binyamin TR, Blackburn SL, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Folkerth RD, Frerichs KU, Howard BM, Jahromi BR, Niemela M, Ojemann SG, Patel NJ, Richardson RM, Shi X, Valle-Giler EP, Wang AC, Welch BG, Williams Z, Zusman EE, Weiss ST, Du R; GENIE Investigators. A transcriptomic comparative study of cranial vasculature, *Transl Stroke Res*, accepted.
45. Walker E, Srienc A, Lew D, Guniganti R, Lanzino G, Brinjikji W, Hayakawa M, Samaniego E, Derdeyn C, Du R, Lai R, Sheehan J, Starke RM, Abla A, Abdelsalam A, Gross B, Albuquerque F, Lawton M, Kim L, Levitt M, Amin-Hanjani S, Alaraj A, Abla A, Winkler E, Fox WC, Ploufka A, Bulters D, Durnford A, Satomi J, Tada Y, van Dijk M, Potgieser ARE, Chen CJ, Becerril-Gaitan A, Osbun J, Zipfel G, on behalf of the CONDOR Investigators. Partial embolization does not upgrade DAVF severity, *Neurosurg Focus*, accepted.
46. Nguyen H, Kappel AD, Frerichs KU, Patel NJ, Aziz-Sultan MA, and Du R. Systematic review of cerebrovascular randomised clinical trials from 2018 to 2022, *Cureus*, epub January 2024.
47. Walker EN, Srienc AI, Lew D, Guniganti R, Lanzino G, Brinjikji W, Hayakawa M, Samaniego EA, Derdeyn C, Du R, Lai PMR, Sheehan JP, Starke RM, Abla AA, Abdelsalam A, Gross BA, Albuquerque FC, Lawton MT, Kim LJ, Levitt M, Amin-Hanjani S, Alaraj A, Winkler EA, Fox WC, Polifka A, Hall S, Bulters DO, Durnford A, Satomi J, Tada Y, van Dijk JM, Potgieser A, Chen CJ, Becerril-Gaitan A, Osbun J, Zipfel GJ, on behalf of the CONDOR Investigators. Dural arteriovenous fistulas are not observed to convert to a higher grade after partial embolization, *Neurosurg Focus*, epub March 2024.
48. Kappel AD, Feroze A, Torio E, Sukumaran M, and Du R. Management of Moyamoya disease: a review of current and future therapeutic strategies, *J Neurosurgery*, epub April 2024.
49. Pradilla G, Ratcliff JJ, Hall AJ, Saville BR, Allen JW, Paulon G, McGlothlin A, Lewis RJ, Fitzgerald M, Caveney AF, Li XT, Bain M, Gomes J, Jankowitz B, Zenonos G, Molyneaux BJ, Davies J, Siddiqui A, Chicoine MR, Keyrouz SG, Grossberg JA, Shah MV, Singh R, Bohnstedt BN, Frankel M, Wright DW, Barrow DL; ENRICH trial investigators; ENRICH Trial Investigators. Trial of Early Minimally Invasive Removal of Intracerebral Hemorrhage, *N Engl J Med*, 390:1277-1289, 2024.
50. Kappel AD, Jha R, Guggilapu S, Smith WJ, Feroze AH, Dmytriw AA, Vicenty-Padilla J, Alcedo Guardia RE, Gessler FA, Patel NJ, Du R, See AP, Peruzzi PP, Aziz-Sultan MA*, Bernstock JD*. Endovascular applications for the management of high-grade gliomas in the modern era. *Cancers*, accepted. *These authors contributed equally.
51. Durrani Y, Gerstl JVE, Murphy D, Harris A, Saali I, Gropen T, Shekhar S, Kappel AD, Patel NJ, Du R, Alcedo Guardia RE, Vicenty-Padilla JC, Dmytriw AA, Mendes Pereira V, Izzy S, Khan A, Aziz-Sultan MA, Liebeskind DS, Davies JM, Siddiqui AH, Gaude E, Bernstock JD. Prospective validation of GFAP, D-dimer and clinical scales for acute large vessel occlusion ischemic stroke detection, *Stroke Vasc Interv Neurol*, epub May 2024.
52. Jha R, Zhao M, Ghannam JY, Blitz S, Chalif JJ, Altshuler M, and Du R. Benign natural progression of small cavernous carotid aneurysms suggests limited clinical utility of serial longitudinal follow-up, *Neurosurgery*, accepted.
53. Chen KS, Khawaja A, Xu E, Mekary RA, Vaitkevicius H, Aziz-Sultan A, Du R, Patel NJ. Changes in inpatient brain arteriovenous malformation management in the United States following the ARUBA trial: analysis of an interrupted time series design, *Clin Neurol Neurosurg*, accepted.
54. Lai PMR*, Akama-Garren E*, Can A, Tirado S, Castro VM, Dligach D, Finan S, Gainer VS, Shadick NA, Savova G, Murphy SN, Cai T, Weiss ST, Du R. Family history as the strongest predictor of aortic and peripheral aneurysms in patients with intracranial aneurysms, *J Clin Neurosci*, 126:128-134, 2024.
55. Frisken S, Haouchine N, Chlorogiannis D, Gopalakrishnan V, Cafaro A, Wells W, Golby A, and Du R. VESCL: An open source 2D vessel contouring library, epub June 2024.
56. Tirado S, Bass DI, Feroze AH, Johnston BR, Bi WL, Du R. Ruptured traumatic pseudoaneurysm of the middle cerebral artery following minor trauma treated with an MCA-MCA bypass: Case report, *Surg Neurol Int*, epub July 2024.
57. Ryu JY, Cerecedo-Lopez C, Yang H, Ryu I, Du R. Brain-targeted intranasal delivery of protein-based gene therapy for treatment of ischemic stroke, *Theranostics*, 14:4773-4786, 2024.

58. Lai PR, Beazer M, Frerichs KU, Patel NJ, Aziz-Sultan MA, and Du R. Association between moyamoya revascularization surgery and neurologic events during pregnancy: systematic review, *Neurosurgery*, accepted.
59. Raygor KP, Abdelsalam A, Tonetti DA, Raper DMS, Guniganti R, Durnford AJ, Giordan E, Brinjikji W, Chen CJ, Abecassis IJ, Levitt MR, Polifka AJ, Derdeyn CP, Samaniego EA, Kwasnicki A, Alaraj A, Potgieser ARE, Chen S, Tada Y, Kansagra AP, Satomi J, Eatz T, Peterson EC, Starke RM, van Dijk JMC, Amin-Hanjani S, Hayakawa M, Gross BA, Fox WC, Kim L, Sheehan J, Lanzino G, Du R, Lai PMR, Bulters DO, Zipfel GJ, Ablal AA, on behalf of the Consortium for Dural Arteriovenous Fistula Outcomes Research. Microsurgical treatment of intracranial dural arteriovenous fistulas: A collaborative investigation from the multicenter Consortium for Dural Arteriovenous Fistula Outcomes Research (CONDOR), *Neurosurgery*, accepted.
60. Musmar B, Roy JM, Abdalrazeq H, Atallah E, Naamani KE, Chen CJ, Jabre R, Saad H, Grossberg JA, Dmytriw AA, Patel AB, Khorasanizadeh M, Ogilvy CS, Thomas AJ, Monteiro A, Siddiqui A, Cortez GM, Hanel RA, Porto G, Spiotta AM, Piscopo AJ, Hasan DM, Ghorbani M, Weinberg J, Nimjee SM, Bekelis K, Salem MM, Burkhardt JK, Zetchi A, Matouk C, Howard BM, Lai R, Du R, Abbas R, Sioutas GS, Amllay A, Munoz A, Herial NA, Tjoumakaris SI, Gooch MR, Rosenwasser RH, and Jabbour P. The Impact of hypertension on clinical outcomes in moyamoya disease: A multicenter, propensity score-matched analysis, *Acta Neurochir (Wien)*, 166:366, 2024.
61. Musmar B, Roy JM, Abdalrazeq H, Kaul A, Atallah E, Naamani KE, Chen CJ, Jabre R, Saad H, Grossberg JA, MD, Dmytriw AA, Patel AB, Khorasanizadeh M, Ogilvy CS, Thomas AJ, Monteiro A, Siddiqui A, Cortez GM, Hanel RA, Porto G, Spiotta AM, Piscopo AJ, Hasan DM, Ghorbani M, Weinberg J, Nimjee SM, Bekelis K, Salem MM, Burkhardt J, Zetchi A, Matouk C, Howard BM, Lai R, Du R, Abbas R, Sioutas GS, Amllay A, Munoz A, Herial NA, Tjoumakaris SI, Gooch MR, Rosenwasser RH, and Jabbour P. Comparative outcomes of unilateral vs bilateral revascularization in moyamoya disease: A multicenter retrospective study, *Neurosurgery*, accepted.
62. Lai PMR, Jimenez M, Rexrode K*, and Du R*. Plasma estrogen levels and aneurysmal subarachnoid hemorrhage in women, *World Neurosurgery*, accepted. *These authors contributed equally.
63. Ryu JY*, Zhang J*, Tirado S, Dagen S, Frerichs KU, Patel NJ, Aziz-Sultan MA, Brown A, Rogers-Grazado M, Amr SS, Weiss T, and Du R. MiRNA expression profiling reveals a potential role of microRNA-148b-3p in cerebral vasospasm in subarachnoid hemorrhage, *Sci Reports*, accepted. *These authors contributed equally.



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CERTIFICATIONS

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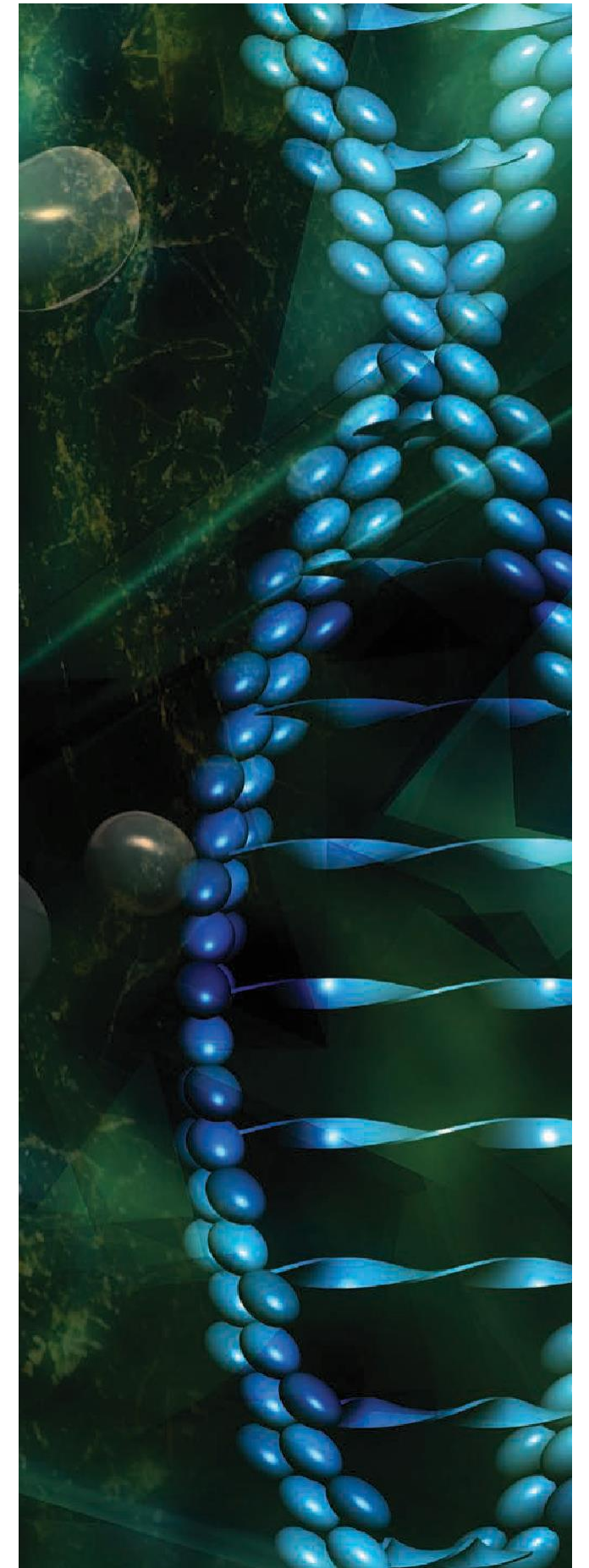
CLINICAL INTERESTS

Aneurysms, arteriovenous malformations, Carotid Artery Disease, Cerebral Hemorrhage, Cerebral Ischemia, Cerebral Revascularization, Cerebrovascular Disease, Embolization, Neurological, Endovascular Neurosurgery, Petrosal Sinus Sampling, Stroke Therapy

PUBLICATIONS

1. Dasenbrock HH, Rudy RF, Smith TR, Gormley WB, Patel NJ, Frerichs KU, Aziz-Sultan MA, Du R. Adverse events after clipping of unruptured intracranial aneurysms: the NSQIP unruptured aneurysm scale. *J Neurosurg*. 2019 Mar 15;132(4):1123-1132. doi: 10.3171/2018.12.JNS182873. PMID: 30875693.
2. Cerecedo-Lopez CD, Cantu-Aldana A, Patel NJ, Aziz-Sultan MA, Frerichs KU, Du R. Insulin in the Management of Acute Ischemic Stroke: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2020 Apr;13. doi: 10.1016/j.wneu.2020.01.056. Epub 2020 Jan 16. PMID: 31954893.
3. Subat YW, Dasenbrock HH, Gross BA, Patel NJ, Frerichs KU, Du R, Aziz-Sultan MA. Periprocedural intracranial hemorrhage after embolization of cerebral arteriovenous malformations: a meta-analysis. *J Neurosurg*. 2019 Sep 13;133(5):1417-1427. doi: 10.3171/2019.5.JNS183204. PMID: 31518979.
4. Lai PMR, Ng I, Gormley WB, Patel NJ, Frerichs KU, Aziz-Sultan MA, Du R. Familial Predisposition and Differences in Radiographic Patterns in Spontaneous Nonaneurysmal Subarachnoid Hemorrhage. *Neurosurgery*. 2021 Jan 13;88(2):413-419. doi: 10.1093/neuros/nyaa396. PMID: 33017030.
5. Chen CJ, Buell TJ, Ding D, Guniganti R, Kansagra AP, Lanzino G, Brinjikji W, Kim L, Levitt MR, Abecassis IJ, Bulters D, Durnford A, Fox WC, Polifka AJ, Gross BA, Hayakawa M, Derdeyn CP, Samaniego EA, Amin-Hanjani S, Alaraj A, Kwasnicki A, van Dijk JMC, Potgieser ARE, Starke RM, Chen S, Satomi J, Tada Y, Ablal A, Phelps RRL, Du R, Lai R, Zipfel GJ, Sheehan JP; Consortium for Dural Arteriovenous Fistula Outcomes Research. Observation Versus Intervention for Low-Grade Intracranial Dural Arteriovenous Fistulas. *Neurosurgery*. 2021 May 13;88(6):1111-1120. doi: 10.1093/neuros/nyab024. PMID: 33582776.
6. Lai PMR, Patel NJ, Frerichs KU, Patel AB, Aziz-Sultan MA, Ogilvy CS, Du R. Direct vs Indirect Revascularization in a North American Cohort of Moyamoya Disease. *Neurosurgery*. 2021 Jul 15;89(2):315-322. doi: 10.1093/neuros/nyab156. PMID: 33957674.

7. Lai PMR, Ng I, Gormley WB, Patel N, Frerichs KU, Aziz-Sultan MA, Du R. Cannabis Use and Increased Nonaneurysmal Subarachnoid Hemorrhage in the Past Decade. *World Neurosurg.* 2021 Oct;154. doi: 10.1016/j.wneu.2021.07.079. Epub 2021 Jul 27. PMID: 34325028.
8. Samaniego EA, Roa JA, Hayakawa M, Chen CJ, Sheehan JP, Kim LJ, Abecassis IJ, Levitt MR, Guniganti R, Kansagra AP, Lanzino G, Giordan E, Brinjikji W, Bulters D, Durnford A, Fox WC, Polifka AJ, Gross BA, Amin-Hanjani S, Alaraj A, Kwasnicki A, Starke RM, Sur S, van Dijk JMC, Potgieser ARE, Satomi J, Tada Y, Abla A, Winkler E, Du R, Lai PMR, Zipfel GJ, Derdeyn CP; Consortium for Dural Arteriovenous Fistula Outcomes Research; CONDOR Collaborators. Dural arteriovenous fistulas without cortical venous drainage: presentation, treatment, and outcomes. *J Neurosurg.* 2021 Sep 10;136(4):942-950. doi: 10.3171/2021.1.JNS202825. PMID: 34507278.
9. Guniganti R, Giordan E, Chen CJ, Abecassis IJ, Levitt MR, Durnford A, Smith J, Samaniego EA, Derdeyn CP, Kwasnicki A, Alaraj A, Potgieser ARE, Sur S, Chen SH, Tada Y, Winkler E, Phelps RRL, Lai PMR, Du R, Abla A, Satomi J, Starke RM, van Dijk JMC, Amin-Hanjani S, Hayakawa M, Gross BA, Fox WC, Bulters D, Kim LJ, Sheehan J, Lanzino G, Piccirillo JF, Kansagra AP, Zipfel GJ; Consortium for Dural Arteriovenous Fistula Outcomes Research; CONDOR Collaborators. Consortium for Dural Arteriovenous Fistula Outcomes Research (CONDOR): rationale, design, and initial characterization of patient cohort. *J Neurosurg.* 2021 Sep 10;136(4):951-961. doi: 10.3171/2021.1.JNS202790. PMID: 34507282.
10. Abecassis IJ, Meyer RM, Levitt MR, Sheehan JP, Chen CJ, Gross BA, Smith J, Fox WC, Giordan E, Lanzino G, Starke RM, Sur S, Potgieser ARE, van Dijk JMC, Durnford A, Bulters D, Satomi J, Tada Y, Kwasnicki A, Amin-Hanjani S, Alaraj A, Samaniego EA, Hayakawa M, Derdeyn CP, Winkler E, Abla A, Lai PMR, Du R, Guniganti R, Kansagra AP, Zipfel GJ, Kim LJ; Consortium for Dural Arteriovenous Fistula Outcomes Research; CONDOR Collaborators. Recurrence after cure in cranial dural arteriovenous fistulas: a collaborative effort by the Consortium for Dural Arteriovenous Fistula Outcomes Research (CONDOR). *J Neurosurg.* 2021 Sep 10;136(4):981-989. doi: 10.3171/2021.1.JNS202033. PMID: 34507283.
11. Abecassis IJ, Meyer RM, Levitt MR, Sheehan JP, Chen CJ, Gross BA, Lockerman A, Fox WC, Brinjikji W, Lanzino G, Starke RM, Chen SH, Potgieser ARE, van Dijk JMC, Durnford A, Bulters D, Satomi J, Tada Y, Kwasnicki A, Amin-Hanjani S, Alaraj A, Samaniego EA, Hayakawa M, Derdeyn CP, Winkler E, Abla A, Lai PMR, Du R, Guniganti R, Kansagra AP, Zipfel GJ, Kim LJ; Consortium for Dural Arteriovenous Fistula Outcomes Research; CONDOR Collaborators. Assessing the rate, natural history, and treatment trends of intracranial aneurysms in patients with intracranial dural arteriovenous fistulas: a Consortium for Dural Arteriovenous Fistula Outcomes Research (CONDOR) investigation. *J Neurosurg.* 2021 Sep 10;136(4):971-980. doi: 10.3171/2021.1.JNS202861. PMID: 34507300.
12. Chen CJ, Buell TJ, Ding D, Guniganti R, Kansagra AP, Lanzino G, Giordan E, Kim LJ, Levitt MR, Abecassis IJ, Bulters D, Durnford A, Fox WC, Polifka AJ, Gross BA, Hayakawa M, Derdeyn CP, Samaniego EA, Amin-Hanjani S, Alaraj A, Kwasnicki A, van Dijk JMC, Potgieser ARE, Starke RM, Sur S, Satomi J, Tada Y, Abla AA, Winkler EA, Du R, Lai PMR, Zipfel GJ, Sheehan JP; Consortium for Dural Arteriovenous Fistula Outcomes Research; CONDOR Collaborators. Intervention for unruptured high-grade intracranial dural arteriovenous fistulas: a multicenter study. *J Neurosurg.* 2021 Sep 10;136(4):962-970. doi: 10.3171/2021.1.JNS202799. PMID: 34608140.
13. Lak AM, Cerecedo-Lopez CD, Cha J, Aziz-Sultan MA, Frerichs KU, Gormley WB, Mekary RA, Du R, Patel NJ. Seizure Outcomes After Interventional Treatment in Cerebral Arteriovenous Malformation-Associated Epilepsy: A Systematic Review and Meta-Analysis. *World Neurosurg.* 2022 Apr;160. doi: 10.1016/j.wneu.2021.09.063. PMID: 35364673.
14. Lai PMR, Gomez-Paz S, Patel NJ, Frerichs KU, Thomas AJ, Aziz-Sultan MA, Patel AB, Ogilvy CS, Du R. Asymptomatic Moyamoya Disease in a North American Adult Cohort. *World Neurosurg.* 2022 May;161. doi: 10.1016/j.wneu.2022.01.076. Epub 2022 Jan 29. PMID: 35092810.
15. Cerecedo-Lopez CD, Ng I, Nguyen HB, Lai PMR, Gormley WB, Patel N, Frerichs KU, Aziz-Sultan MA, Du R. Incidence and Outcomes of Registry-Based Acute Myocardial Infarction After Aneurysmal Subarachnoid Hemorrhage. *Neurocrit Care.* 2022 Jun;36(3):772-780. doi: 10.1007/s12028-021-01365-3. Epub 2021 Oct 25. PMID: 34697769.
16. Durnford AJ, Akarca D, Culliford D, Millar J, Guniganti R, Giordan E, Brinjikji W, Chen CJ, Abecassis IJ, Levitt M, Polifka AJ, Derdeyn CP, Samaniego EA, Kwasnicki A, Alaraj A, Potgieser ARE, Chen S, Tada Y, Phelps R, Abla A, Satomi J, Starke RM, van Dijk JMC, Amin-Hanjani S, Hayakawa M, Gross B, Fox WC, Kim L, Sheehan J, Lanzino G, Kansagra AP, Du R, Lai R, Zipfel GJ, Bulters DO; CONDOR Investigators. Risk of Early Versus Later Rebleeding From Dural Arteriovenous Fistulas With Cortical Venous Drainage. *Stroke.* 2022 Jul;53(7):2340-2345. doi: 10.1161/STROKEAHA.121.036450. Epub 2022 Apr 14. PMID: 35420453; PMCID: PMC9232241.
17. Lai PMR, Ryu JY, Park SC, Gross BA, Dickinson LD, Dagen S, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Blackburn S, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Frerichs KU, Niemela M, Ojemann SG, Patel NJ, Shi X, Valle-Giler EP, Wang AC, Welch BG, Zusman EE, Weiss ST, Du R. Somatic Variants in SVIL in Cerebral Aneurysms. *Neurol Genet.* 2022 Nov 28;8(6). doi: 10.1212/NXG.0000000000200040. PMID: 36475054; PMCID: PMC9720733.
18. Kappel AD, Nguyen HB, Frerichs KU, Patel NJ, Aziz-Sultan MA, Du R. Randomized Clinical Trials in Cerebrovascular Neurosurgery From 2018 to 2022. *Cureus.* 2024 Jan 16;16(1). doi: 10.7759/cureus.52397. PMID: 38361699; PMCID: PMC10869144.
19. Gerstl JVE, Gupta S, Stenberg CE, Chabros J, Nonnenbroich LF, Lindberg R, Altshuler MS, Seaver D, Mooney MA, Frerichs KU, Smith TR, Arnaout O. From Operating Room to Courtroom: Analyzing Malpractice Trajectories in Cranial Neurosurgery. *Neurosurgery.* 2024 Jun 25. doi: 10.1227/neu.0000000000003052. Epub ahead of print. PMID: 38916340.
20. Ryu JY, Zhang J, Tirado SR, Dagen S, Frerichs KU, Patel NJ, Aziz-Sultan MA, Brown A, Rogers-Grazado M, Amr SS, Weiss ST, Du R. MiRNA expression profiling reveals a potential role of microRNA-148b-3p in cerebral vasospasm in subarachnoid hemorrhage. *Sci Rep.* 2024 Sep 29;14(1):22539. doi: 10.1038/s41598-024-73579-2. PMID: 39341923; PMCID: PMC11438990.
21. Lai PMR, Beazer M, Frerichs KU, Patel NJ, Aziz-Sultan MA, Du R. Association Between Moyamoya Revascularization Surgery and Neurologic Events During Pregnancy: Systematic Review. *Neurosurgery.* 2024 Oct 2. doi: 10.1227/neu.0000000000003184. Epub ahead of print. PMID: 39356157.
22. Zhang J, Ryu JY, Tirado SR, Dickinson LD, Abosch A, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Binyamin TR, Blackburn SL, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Folkerth RD, Frerichs KU, Howard BM, Jahromi BR, Niemela M, Ojemann SG, Patel NJ, Richardson RM, Shi X, Valle-Giler EP, Wang AC, Welch BG, Williams Z, Zusman EE, Weiss ST, Du R; GENIE Investigators. A Transcriptomic Comparative Study of Cranial Vasculature. *Transl Stroke Res.* 2024 Dec;15(6):1108-1122. doi: 10.1007/s12975-023-01186-w. Epub 2023 Aug 23. PMID: 37612482.





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CERTIFICATIONS

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CLINICAL INTERESTS

Acoustic neuroma, arachnoid cyst, awake surgery
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assisted tumor deconstruction,
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PUBLICATIONS

1. Frisken S, Luo M, Juvekar P, Bunevicius A, Machado I, Unadkat P, Bertotti MM, Toews M, Wells WM, Miga MI, Golby AJ. A comparison of thin-plate spline deformation and finite element modeling to compensate for brain shift during tumor resection. *Int J Comput Assist Radiol Surg.* 2020 Jan;15(1):75-85. doi: 10.1007/s11548-019-02057-2. Epub 2019 Aug 23. PMID: 31444624; PMCID: PMC6952552.
2. Xie G, Zhang F, Leung L, Mooney MA, Epprecht L, Norton I, Rathi Y, Kikinis R, Al-Mefty O, Makris N, Golby AJ, O'Donnell LJ. Anatomical assessment of trigeminal nerve tractography using diffusion MRI: A comparison of acquisition b-values and single- and multi-fiber tracking strategies. *Neuroimage Clin.* 2020;25:102160. doi: 10.1016/j.nicl.2019.102160. Epub 2020 Jan 8. PMID: 31954337; PMCID: PMC6962690.
3. Yao S, Liebenthal E, Juvekar P, Bunevicius A, Vera M, Rigolo L, Golby AJ, Tie Y. Sex Effect on Presurgical Language Mapping in Patients With a Brain Tumor. *Front Neurosci.* 2020 Jan 24;14:4. doi: 10.3389/fnins.2020.00004. PMID: 32038154; PMCID: PMC6992642.
4. Golby AJ, Leuthardt EC, Duffau H, Berger MS. Introduction. Advances and future directions in brain mapping in neurosurgery. *Neurosurg Focus.* 2020 Feb 1;48(2). doi: 10.3171/2019.11.FOCUS19880. PMID: 32006943.
5. Mustroph ML, Zekelman LR, Golby AJ. Editorial. Probing the tract organization of language: Heschl's gyrus fiber intersection area. *Neurosurg Focus.* 2020 Feb 1;48(2). doi: 10.3171/2019.11.FOCUS19886. PMID: 32006944.
6. Catalino MP, Yao S, Green DL, Laws ER, Golby AJ, Tie Y. Mapping cognitive and emotional networks in neurosurgical patients using resting-state functional magnetic resonance imaging. *Neurosurg Focus.* 2020 Feb 1;48(2). doi: 10.3171/2019.11.FOCUS19773. PMID: 32006946; PMCID: PMC7712886.
7. Stopa BM, Senders JT, Broekman MLD, Vangel M, Golby AJ. Preoperative functional MRI use in neurooncology patients: a clinician survey. *Neurosurg Focus.* 2020 Feb 1;48(2). doi: 10.3171/2019.11.FOCUS19779. PMID: 32006949; PMCID: PMC7818717.
8. Leung LWL, Unadkat P, Bertotti MM, Bi WL, Essayed W, Bunevicius A, Chavakula V, Rigolo L, Fumagalli L, Tie Z, Golby AJ, Tie Y. Clinical Utility of Preoperative Bilingual Language fMRI Mapping in Patients with Brain Tumors. *J Neuroimaging.* 2020 Mar;30(2):175-183. doi: 10.1111/jon.12690. Epub 2020 Feb 10. PMID: 32037662; PMCID: PMC7115038.
9. Zhang F, Noh T, Juvekar P, Frisken SF, Rigolo L, Norton I, Kapur T, Pujol S, Wells W 3rd, Yarmarkovich A, Kindlmann G, Wassermann D, San Jose Estepar R, Rathi Y, Kikinis R, Johnson HJ, Westin CF, Pieper S, Golby AJ, O'Donnell LJ. SlicerDMRI: Diffusion MRI and Tractography Research Software for Brain Cancer Surgery Planning and Visualization. *JCO Clin Cancer Inform.* 2020 Mar;4:299-309. doi: 10.1200/CCI.19.00141. PMID: 32216636; PMCID: PMC7113081.
10. Yao S, Lin P, Vera M, Akter F, Zhang RY, Zeng A, Golby AJ, Xu G, Tie Y, Song J. Hormone levels are related to functional compensation in prolactinomas: A resting-state fMRI study. *J Neurol Sci.* 2020 Apr 15;411:116720. doi: 10.1016/j.jns.2020.116720. Epub 2020 Feb 1. PMID: 32044686; PMCID: PMC7096250.
11. Eichenlaub JB, Biswal S, Peled N, Rivilis N, Golby AJ, Lee JW, Westover MB, Halgren E, Cash SS. Reactivation of Motor-Related Gamma Activity in Human NREM Sleep. *Front Neurosci.* 2020 May 12;14:449. doi: 10.3389/fnins.2020.00449. PMID: 32477056; PMCID: PMC7235414.
12. McDannold N, Zhang Y, Supko JG, Power C, Sun T, Vykhodtseva N, Golby AJ, Reardon DA. Blood-brain barrier disruption and delivery of irinotecan in a rat model using a clinical transcranial MRI-guided focused ultrasound system. *Sci Rep.* 2020 May 29;10(1):8766. doi: 10.1038/s41598-020-65617-6. PMID: 32472017; PMCID: PMC7260193.
13. Bunevicius A, McDannold NJ, Golby AJ. Focused Ultrasound Strategies for Brain Tumor Therapy. *Oper Neurosurg (Hagerstown).* 2020 Jul 1;19(1):9-18. doi: 10.1093/ons/ozz374. PMID: 31853548; PMCID: PMC7293897.
14. Miskin N, Unadkat P, Carlton ME, Golby AJ, Young GS, Huang RY. Frequency and Evolution of New Postoperative Enhancement on 3 Tesla Intraoperative and Early Postoperative Magnetic Resonance Imaging. *Neurosurgery.* 2020 Aug 1;87(2):238-246. doi: 10.1093/neuros/nyz398. PMID: 31584071; PMCID: PMC7594113.
15. Zhang F, Cetin Karayumak S, Hoffmann N, Rathi Y, Golby AJ, O'Donnell LJ. Deep white matter analysis (DeepWMA): Fast and consistent tractography segmentation. *Med Image Anal.* 2020 Oct;65:101761. doi: 10.1016/j.media.2020.101761. Epub 2020 Jun 24. PMID: 32622304; PMCID: PMC7483951.
16. Zhang F, Xie G, Leung L, Mooney MA, Epprecht L, Norton I, Rathi Y, Kikinis R, Al-Mefty O, Makris N, Golby AJ, O'Donnell LJ. Creation of a novel trigeminal tractography atlas for automated trigeminal nerve identification. *Neuroimage.* 2020 Oct 15;220:117063. doi: 10.1016/j.neuroimage.2020.117063. Epub 2020 Jun 20. PMID: 32574805; PMCID: PMC7572753.
17. Noh T, Mustroph M, Golby AJ. Intraoperative Imaging for High-Grade Glioma Surgery. *Neurosurg Clin N Am.* 2021 Jan;32(1):47-54. doi: 10.1016/j.nec.2020.09.003. Epub 2020 Nov 5. PMID: 33223025; PMCID: PMC7813557.
18. Sprugnoli G, Golby AJ, Santarnecchi E. Newly discovered neuron-to-glioma communication: new noninvasive therapeutic opportunities on the horizon? *Neurooncol Adv.* 2021 Feb 4;3(1). doi: 10.1093/naojnl/vdab018. PMID: 33738449; PMCID: PMC7954106.
19. Sprugnoli G, Rossi S, Liew SL, Bricolo E, Costantini G, Salvi C, Golby AJ, Musaeus CS, Pascual-Leone A, Rossi A, Santarnecchi E. Enhancement of semantic integration reasoning by tRNS. *Cogn Affect Behav Neurosci.* 2021 Aug;21(4):736-746. doi: 10.3758/s13415-021-00885-x. Epub 2021 Apr 2. PMID: 33796985; PMCID: PMC8976450.
20. Sprugnoli G, Rossi S, Rotenberg A, Pascual-Leone A, El-Fakhri G, Golby AJ, Santarnecchi E. Personalised, image-guided, noninvasive brain stimulation in gliomas: Rationale, challenges and opportunities. *EBioMedicine.* 2021 Aug;70:103514. doi: 10.1016/j.ebiom.2021.103514. Epub 2021 Aug 11. PMID: 34391090; PMCID: PMC8365310.
21. He J, Zhang F, Xie G, Yao S, Feng Y, Bastos DCA, Rathi Y, Makris N, Kikinis R, Golby AJ, O'Donnell LJ. Comparison of multiple tractography methods for reconstruction of the retinogeniculate visual pathway using diffusion MRI. *Hum Brain Mapp.* 2021 Aug 15;42(12):3887-3904. doi: 10.1002/hbm.25472. Epub 2021 May 12. PMID: 33978265; PMCID: PMC8288095.
22. Noh T, Juvekar P, Huang R, Lee G, Ogasawara CT, Golby AJ. Biopsy Artifact in Laser Interstitial Thermal Therapy: A Technical Note. *Front Oncol.* 2021 Nov 18;11:746416. doi: 10.3389/fonc.2021.746416. PMID: 34868945; PMCID: PMC8637457.

23. Yeh FC, Irimia A, Bastos DCA, Golby AJ. Tractography methods and findings in brain tumors and traumatic brain injury. *Neuroimage*. 2021 Dec 15;245:118651. doi: 10.1016/j.neuroimage.2021.118651. Epub 2021 Oct 18. PMID: 34673247; PMCID: PMC8859988.
24. Bernstock JD, Torio EF, Raghu ALB, Chua M, Chen JA, Segar D, Gupta S, White PJ, McDannold N, Golby AJ, Cosgrove GR. Transcranial MR-Guided Focused Ultrasound and Hyperostosis Calvariae Diffusa: Case Report and Systematic Review of the Literature. *Stereotact Funct Neurosurg*. 2022;100(5-6):331-339. doi: 10.1159/000527232. Epub 2022 Dec 15. PMID: 36521432.
25. Yao S, Rigolo L, Yang F, Vangel MG, Wang H, Golby AJ, Liebenthal E, Tie Y. Movie-watching fMRI for presurgical language mapping in patients with brain tumour. *J Neurol Neurosurg Psychiatry*. 2022 Feb;93(2):220-221. doi: 10.1136/jnnp-2020-325738. Epub 2021 Jun 25. PMID: 34172562; PMCID: PMC8709882.
26. Peruzzi P, Valdes PQ, Aghi MK, Berger M, Chiocca EA, Golby AJ. The Evolving Role of Neurosurgical Intervention for Central Nervous System Tumors. *Hematol Oncol Clin North Am*. 2022 Feb;36(1):63-75. doi: 10.1016/j.hoc.2021.08.003. Epub 2021 Sep 23. PMID: 34565649.
27. Zekelman LR, Zhang F, Makris N, He J, Chen Y, Xue T, Liera D, Drane DL, Rathi Y, Golby AJ, O'Donnell LJ. White matter association tracts underlying language and theory of mind: An investigation of 809 brains from the Human Connectome Project. *Neuroimage*. 2022 Feb 1;246:118739. doi: 10.1016/j.neuroimage.2021.118739. Epub 2021 Nov 29. PMID: 34856375; PMCID: PMC8862285.
28. Essayed WI, Juvekar P, Bernstock JD, Rassi MS, Almefty K, Zamani AA, Golby AJ, Al-Mefty O. Multimodal Intraoperative Image-Driven Surgery for Skull Base Chordomas and Chondrosarcomas. *Cancers (Basel)*. 2022 Feb 15;14(4):966. doi: 10.3390/cancers14040966. PMID: 35205724; PMCID: PMC8870528.
29. Frisken S, Haouchine N, Du R, Golby AJ. Using temporal and structural data to reconstruct 3D cerebral vasculature from a pair of 2D digital subtraction angiography sequences. *Comput Med Imaging Graph*. 2022 Jul;99:102076. doi: 10.1016/j.compmedimag.2022.102076. Epub 2022 May 21. PMID: 35636377; PMCID: PMC10801782.
30. Sprugnoli G, Rigolo L, Faria M, Juvekar P, Tie Y, Rossi S, Sverzellati N, Golby AJ, Santarnecchi E. Tumor BOLD connectivity profile correlates with glioma patients' survival. *Neurooncol Adv*. 2022 Sep 25;4(1)
31. . doi: 10.1093/noajnl/vdac153. PMID: 36532508; PMCID: PMC9753902.
32. Notarangelo G, Spinelli JB, Perez EM, Baker GJ, Kurmi K, Elia I, Stopka SA, Baquer G, Lin JR, Golby AJ, Joshi S, Baron HF, Drijvers JM, Georgiev P, Ringel AE, Zaganjor E, McBrayer SK, Sorger PK, Sharpe AH, Wucherpennig KW, Santagata S, Agar NYR, Suvà ML, Haigis MC. Oncometabolite d-2HG alters T cell metabolism to impair CD8+ T cell function. *Science*. 2022 Sep 30;377(6614):1519-1529. doi: 10.1126/science.abj5104. Epub 2022 Sep 29. PMID: 36173860; PMCID: PMC9629749.
33. Sullivan JJ, Zekelman LR, Zhang F, Juvekar P, Torio EF, Bunevicius A, Essayed WI, Bastos D, He J, Rigolo L, Golby AJ, O'Donnell LJ. Directionally encoded color track density imaging in brain tumor patients: A potential application to neuro-oncology surgical planning. *Neuroimage Clin*. 2023;38:103412. doi: 10.1016/j.nicl.2023.103412. Epub 2023 Apr 20. PMID: 37116355; PMCID: PMC10165166.
34. Juvekar P, Torio E, Bi WL, Bastos DCA, Golby AJ, Frisken SF. Mapping Resection Progress by Tool-Tip Tracking during Brain Tumor Surgery for Real-Time Estimation of Residual Tumor. *Cancers (Basel)*. 2023 Jan 29;15(3):825. doi: 10.3390/cancers15030825. PMID: 36765783; PMCID: PMC9913508.
35. Sadler SJ, Torio EF, Golby AJ. Global cancer surgery in low-resource settings: A strengths, weaknesses, opportunities, and threats analysis. *Cancer*. 2023 Mar 1;129(5):671-684. doi: 10.1002/cncr.34630. Epub 2023 Jan 3. PMID: 36597652; PMCID: PMC10069626.
36. Xue T, Zhang F, Zhang C, Chen Y, Song Y, Golby AJ, Makris N, Rathi Y, Cai W, O'Donnell LJ. Superficial white matter analysis: An efficient point-cloud-based deep learning framework with supervised contrastive learning for consistent tractography parcellation across populations and dMRI acquisitions. *Med Image Anal*. 2023 Apr;85:102759. doi: 10.1016/j.media.2023.102759. Epub 2023 Jan 23. PMID: 36706638; PMCID: PMC9975054.
37. Bertotti MM, Martins ET, Areas FZ, Vascounto HD, Rangel NB, Melo HM, Lin K, Kupek E, Pizzol FD, Golby AJ, Walz R. Glasgow coma scale pupil score (GCS-P) and the hospital mortality in severe traumatic brain injury: analysis of 1,066 Brazilian patients. *Arq Neuropsiquiatr*. 2023 May;81(5):452-459. doi: 10.1055/s-0043-1768671. Epub 2023 May 31. PMID: 37257465; PMCID: PMC10232027.
38. Lucassen RT, Jafari MH, Duggan NM, Jowkar N, Mehrtash A, Fischetti C, Bernier D, Prentice K, Duhaime EP, Jin M, Abolmaesumi P, Heslinga FG, Veta M, Duran-Mendicuti MA, Frisken S, Shyn PB, Golby AJ, Boyer E, Wells WM, Goldsmith AJ, Kapur T. Deep Learning for Detection and Localization of B-Lines in Lung Ultrasound. *IEEE J Biomed Health Inform*. 2023 Sep;27(9):4352-4361. doi: 10.1109/JBHI.2023.3282596. Epub 2023 Sep 6. PMID: 37276107; PMCID: PMC10540221.
39. Haouchine N, Dorent R, Juvekar P, Torio E, Wells WM 3rd, Kapur T, Golby AJ, Frisken S. Learning Expected Appearances for Intraoperative Registration during Neurosurgery. *Med Image Comput Comput Assist Interv*. 2023 Oct;14228:227-237. doi: 10.1007/978-3-031-43996-4_22. Epub 2023 Oct 1. PMID: 38371724; PMCID: PMC10870253.
40. He J, Zhang F, Pan Y, Feng Y, Rushmore J, Torio E, Rathi Y, Makris N, Kikinis R, Golby AJ, O'Donnell LJ. Reconstructing the somatotopic organization of the corticospinal tract remains a challenge for modern tractography methods. *Hum Brain Mapp*. 2023 Dec 1;44(17):6055-6073. doi: 10.1002/hbm.26497. Epub 2023 Oct 4. PMID: 37792280; PMCID: PMC10619402.
41. Bublick EJ, McDannold NJ, Orozco J, Mariano TY, Rigolo L, Golby AJ, Tie Y, White PJ. Transcranial ultrasound neuromodulation for epilepsy: A pilot safety trial. *Brain Stimul*. 2024 Jan-Feb;17(1):7-9. doi: 10.1016/j.brs.2023.11.013. Epub 2023 Dec 8. PMID: 38070706.
42. Li S, Zhang W, Yao S, He J, Zhu C, Gao J, Xue T, Xie G, Chen Y, Torio EF, Feng Y, Bastos DC, Rathi Y, Makris N, Kikinis R, Bi WL, Golby AJ, O'Donnell LJ, Zhang F. Tractography-based automated identification of the retinogeniculate visual pathway with novel microstructure-informed supervised contrastive learning. *bioRxiv [Preprint]*. 2024 Jan 4:2024.01.03.574115. doi: 10.1101/2024.01.03.574115. PMID: 38260369; PMCID: PMC10802389.
43. Krause KA, Woods JK, Golby AJ, Lee EQ, Tanguturi S, Spigelman Z, Ligon AH, De Girolami U, Torre M. Progesterin-associated meningiomatosis with unusual schwannoma-like morphology. *J Neuropathol Exp Neurol*. 2024 Feb 21;83(3):214-216. doi: 10.1093/jnen/nlae008. PMID: 38302661.
44. Tobochnik S, Regan MS, Dorotan MKC, Reich D, Lapinskas E, Hossain MA, Stopka S, Santagata S, Murphy MM, Arnaout O, Bi WL, Chiocca EA, Golby AJ, Mooney MA, Smith TR, Ligon KL, Wen PY, Agar NYR, Lee JW. Pilot trial of perampanel on peritumoral hyperexcitability and clinical outcomes in newly diagnosed high-grade glioma. *medRxiv [Preprint]*. 2024 Apr 18:2024.04.11.24305666. doi: 10.1101/2024.04.11.24305666. PMID: 38645003; PMCID: PMC11030478.
45. Chen Y, Zekelman LR, Zhang C, Xue T, Song Y, Makris N, Rathi Y, Golby AJ, Cai W, Zhang F, O'Donnell LJ. TractGeoNet: A geometric deep learning framework for pointwise analysis of tract microstructure to predict language assessment performance. *Med Image Anal*. 2024 May;94:103120. doi: 10.1016/j.media.2024.103120. Epub 2024 Feb 23. PMID: 38458095; PMCID: PMC11016451.
46. Gupta S, Gal ZT, Athni TS, Calderon C, Callison WÉ, Dada OE, Lie W, Qian C, Reddy R, Rolle M, Baticulon RE, Chaurasia B, Dos Santos Rubio EJ, Esquenazi Y, Golby AJ, Pirzad AF, Park KB; WFNS Global Neurosurgery Committee; EANS Global and Humanitarian Neurosurgery Committee; CAANS Executive Leadership Committee. Mapping the global neurosurgery workforce. Part 1: Consultant neurosurgeon density. *J Neurosurg*. 2024 Jan 16;141(1):1-9. doi: 10.3171/2023.9.JNS231615. PMID: 39508199.
47. Gupta S, Gal ZT, Athni TS, Calderon C, Callison WÉ, Dada OE, Lie W, Qian C, Reddy R, Rolle M, Baticulon RE, Chaurasia B, Dos Santos Rubio EJ, Esquenazi Y, Golby AJ, Pirzad AF, Park KB; WFNS Global Neurosurgery Committee; EANS Global and Humanitarian Neurosurgery Committee; CAANS Executive Leadership Committee. Mapping the global neurosurgery workforce. Part 2: Trainee density. *J Neurosurg*. 2024 Jan 16;141(1):10-16. doi: 10.3171/2023.9.JNS231616. PMID: 39508227.
48. Tripathi V, Rigolo L, Bracken BK, Galvin CP, Golby AJ, Tie Y, Somers DC. Utilizing connectome fingerprinting functional MRI models for motor activity prediction in presurgical planning: A feasibility study. *Hum Brain Mapp*. 2024 Jul 15;45(10). doi: 10.1002/hbm.26764. PMID: 38994667; PMCID: PMC11240144.
49. Frisken SF, Haouchine N, Chlorogiannis DD, Gopalakrishnan V, Cafaro A, Wells WT, Golby AJ, Du R. VESCL: an open source 2D vessel contouring library. *Int J Comput Assist Radiol Surg*. 2024 Aug;19(8):1627-1636. doi: 10.1007/s11548-024-03212-0. Epub 2024 Jun 16. PMID: 38879659.
50. McDannold N, Wen PY, Reardon DA, Fletcher SM, Golby AJ. Cavitation monitoring, treatment strategy, and acoustic simulations of focused ultrasound blood-brain barrier disruption in patients with glioblastoma. *J Control Release*. 2024 Aug;372:194-208. doi: 10.1016/j.jconrel.2024.06.036. Epub 2024 Jun 21. PMID: 38897294; PMCID: PMC11299340.

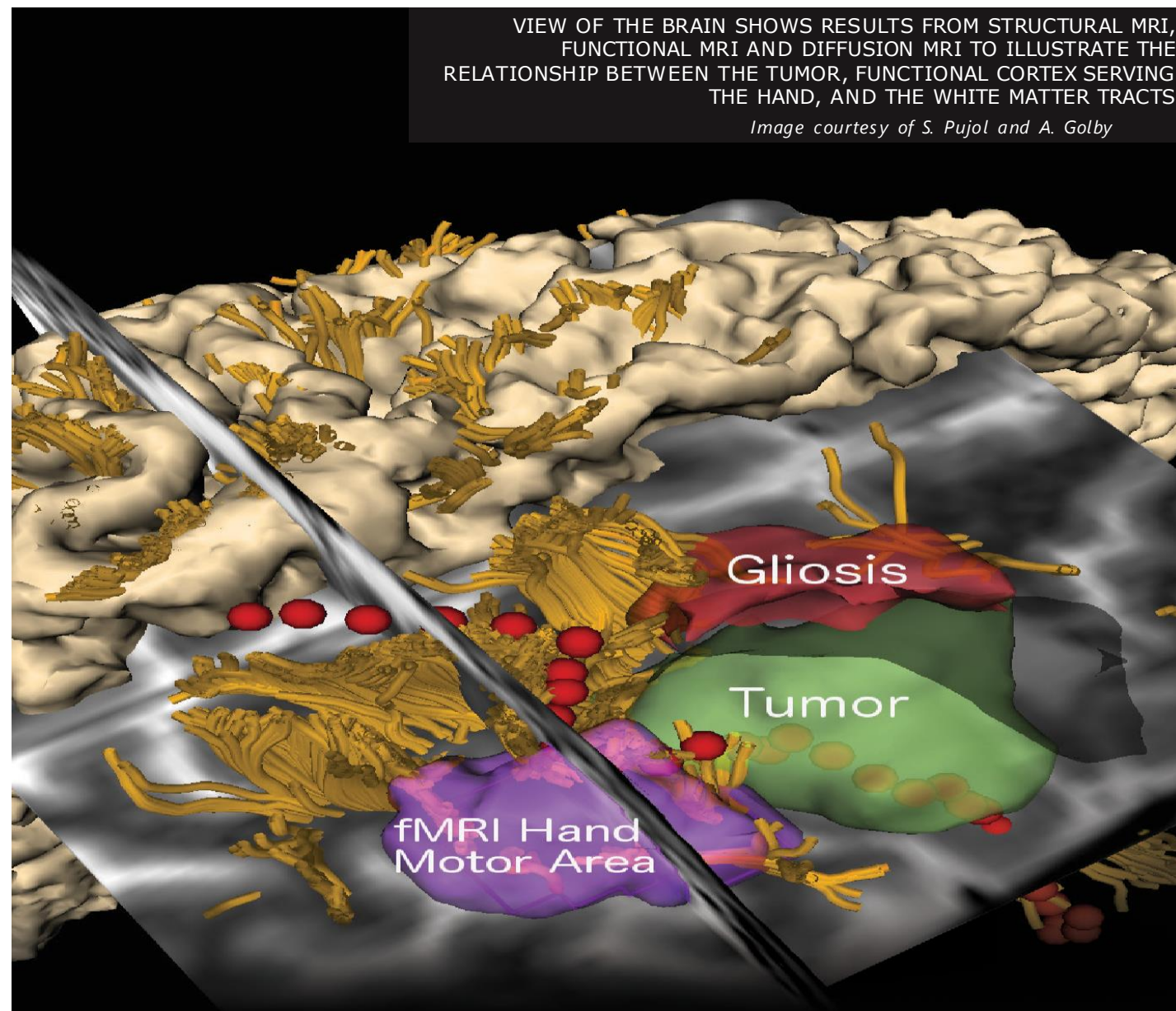
51. Lo Y, Chen Y, Liu D, Liu W, Zekelman L, Zhang F, Rath Y, Makris N, Golby AJ, Cai W, O'Donnell LJ. Cross-domain Fiber Cluster Shape Analysis for Language Performance Cognitive Score Prediction. ArXiv [Preprint]. 2024 Sep 18;arXiv:2403.19001v3. PMID: 38584619; PMCID: PMC10996776.

52. McDannold N, Zhang Y, Fletcher SM, Wen PY, Reardon DA, Golby AJ, Livingstone M. Non-Invasive Blood-Brain Barrier Disruption Using Acoustic Holography With a Clinical Focused Ultrasound System. IEEE Trans Biomed Eng. 2024 Oct;71(10):3046-3054. doi: 10.1109/TBME.2024.3407678. Epub 2024 Sep 19. PMID: 38814760; PMCID: PMC11412788.

53. Lan Z, Chen Y, Rushmore J, Zekelman L, Makris N, Rath Y, Golby AJ, Zhang F, O'Donnell LJ. Fiber

Microstructure Quantile (FMQ) Regression: A Novel Statistical Approach for Analyzing White Matter Bundles from Periphery to Core. bioRxiv [Preprint]. 2024 Oct 22:2024.10.19.619237. doi: 10.1101/2024.10.19.619237. PMID: 39484397; PMCID: PMC11526951.

54. Tobochnik S, Regan MS, Dorotan MKC, Reich D, Lapinskas E, Hossain MA, Stopka S, Meredith DM, Santagata S, Murphy MM, Arnaout O, Bi WL, Chiocca EA, Golby AJ, Mooney MA, Smith TR, Ligon KL, Wen PY, Agar NYR, Lee JW. Pilot Trial of Perampanel on Peritumoral Hyperexcitability in Newly Diagnosed High-grade Glioma. Clin Cancer Res. 2024 Nov 5. doi: 10.1158/1078-0432.CCR-24-1849. Epub ahead of print. PMID: 39499201.



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PUBLICATIONS

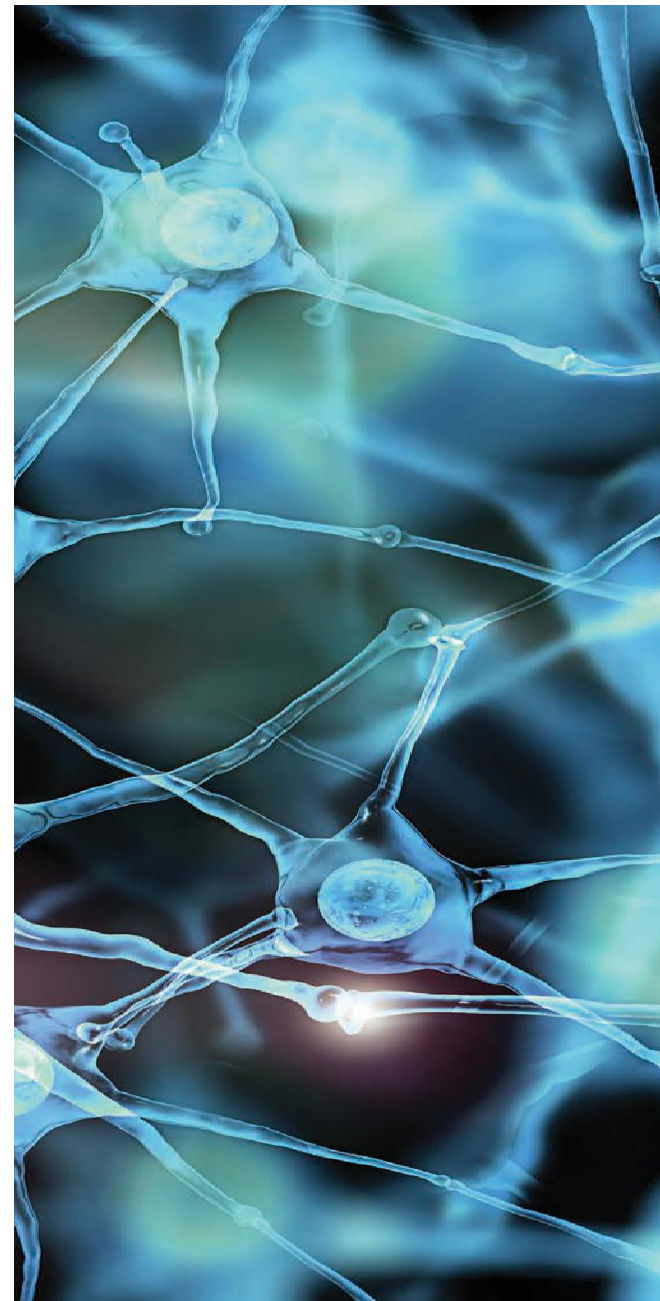
- Senders JT, Cho LD, Calvachi P, McNulty JJ, Ashby JL, Schulte IS, Almekkawi AK, Mehrtash A, Gormley WB, Smith TR, Broekman MLD, Arnaout O. Automating Clinical Chart Review: An Open-Source Natural Language Processing Pipeline Developed on Free-Text Radiology Reports From Patients With Glioblastoma. JCO Clin Cancer Inform. 2020 Jan;4:25-34. doi: 10.1200/CCI.19.00060. PMID: 31977252.
- van Solinge TS, Muskens IS, Kavouridis VK, Gormley WB, Mekary RA, Broekman MLD, Arnaout O. Fibrinolytics and Intraventricular Hemorrhage: A Systematic Review and Meta-analysis. Neurocrit Care. 2020 Feb;32(1):262-271. doi: 10.1007/s12028-019-00786-5. PMID: 31376141; PMCID: PMC7012971.
- Senders JT, Staples P, Mehrtash A, Cote DJ, Taphoorn MJB, Reardon DA, Gormley WB, Smith TR, Broekman ML, Arnaout O. An Online Calculator for the Prediction of Survival in Glioblastoma Patients Using Classical Statistics and Machine Learning. Neurosurgery. 2020 Feb 1;86(2). doi: 10.1093/neuros/nyz403. PMID: 31586211; PMCID: PMC7061165.
- Dasenbrock HH, Rudy RF, Smith TR, Gormley WB, Patel NJ, Frerichs KU, Aziz-Sultan MA, Du R. Adverse events after clipping of unruptured intracranial aneurysms: the NSQIP unruptured aneurysm scale. J Neurosurg. 2019 Mar 15;132(4):1123-1132. doi: 10.3171/2018.12.JNS182873. PMID: 30875693.
- Dolmans RGF, Hulsbergen AFC, Gormley WB, Broekman MLD. Routine Blood Tests for Severe Traumatic Brain Injury: Can They Predict Outcomes? World Neurosurg. 2020 Apr;136. doi: 10.1016/j.wneu.2019.10.086. Epub 2019 Oct 23. PMID: 31655234.
- Robertson FC, Briones R, Mekary RA, Baticulon RE, Jimenez MA, Leather AJM, Broekman MLD, Park KB, Gormley WB, Lucena LL. Task-Sharing for Emergency Neurosurgery: A Retrospective Cohort Study in the Philippines. World Neurosurg X. 2019 Sep 9;6:100058. doi: 10.1016/j.wnsx.2019.100058. PMID: 32309799; PMCID: PMC7154225.

7. Robertson FC, Esene IN, Koliass AG, Kamalo P, Fieggen G, Gormley WB, Broekman MLD, Park KB; Collaborative Working Group. Task-Shifting and Task-Sharing in Neurosurgery: An International Survey of Current Practices in Low- and Middle-Income Countries. *World Neurosurg X*. 2019 Sep 9;6:100059. doi: 10.1016/j.wnsx.2019.100059. PMID: 32309800; PMCID: PMC7154228.
8. Robertson FC, Esene IN, Koliass AG, Khan T, Rosseau G, Gormley WB, Park KB, Broekman MLD; Global Neurosurgery Survey Collaborators. Global Perspectives on Task Shifting and Task Sharing in Neurosurgery. *World Neurosurg X*. 2019 Sep 9;6:100060. doi: 10.1016/j.wnsx.2019.100060. PMID: 32309801; PMCID: PMC7154229.
9. Chen JA, Driver J, Segar D, Bernstock JD, Gupta S, Gormley W. Medullary Infarction Leading to Locked-In Syndrome Following Lumbar Puncture in a Patient with Basilar Invagination. *World Neurosurg*. 2020 May;137:292-295. doi: 10.1016/j.wneu.2020.02.040. Epub 2020 Feb 14. PMID: 32068170.
10. Lai PMR, Ng I, Gormley WB, Patel NJ, Frerichs KU, Aziz-Sultan MA, Du R. Familial Predisposition and Differences in Radiographic Patterns in Spontaneous Nonaneurysmal Subarachnoid Hemorrhage. *Neurosurgery*. 2021 Jan 13;88(2):413-419. doi: 10.1093/neuros/nyaa396. PMID: 33017030.
11. DiRisio AC, Stopa BM, Pompeu YA, Vasudeva V, Khawaja AM, Izzy S, Gormley WB. Extra-Axial Fluid Collections After Decompressive Craniectomy: Management, Outcomes, and Treatment Algorithm. *World Neurosurg*. 2021 May;149. doi: 10.1016/j.wneu.2021.02.052. Epub 2021 Feb 25. PMID: 33639283.
12. Tewarie IA, Hulsbergen AFC, Gormley WB, Peul WC, Broekman MLD. Artificial Intelligence in Clinical Neurosurgery: More than Machinery. *World Neurosurg*. 2021 May;149:302-303. doi: 10.1016/j.wneu.2021.02.057. PMID: 33940691.
13. Persad A, Pham N, Moien-Afshari F, Gormley W, Yan S, Mannix R, Taghibiglou C. Plasma PrPC and ADAM-10 as novel biomarkers for traumatic brain injury and concussion: a pilot study. *Brain Inj*. 2021 May 12;35(6):734-741. doi: 10.1080/02699052.2021.1900602. Epub 2021 Mar 24. PMID: 33760683.
14. Calvachi-Prieto P, McAvoy MB, Cerecedo-Lopez CD, Lu Y, Chi JH, Aglio LS, Smith TR, Gormley WB, Groff MW, Mekary RA, Zaidi HA. Expandable Versus Static Cages in Minimally Invasive Lumbar Interbody Fusion: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2021 Jul;151. doi: 10.1016/j.wneu.2021.04.090. Epub 2021 Apr 30. PMID: 33940268.
15. McAvoy M, Prieto PC, Kaczmarzyk JR, Fernández IS, McNulty J, Smith T, Yu KH, Gormley WB, Arnaout O. Classification of glioblastoma versus primary central nervous system lymphoma using convolutional neural networks. *Sci Rep*. 2021 Jul 26;11(1):15219. doi: 10.1038/s41598-021-94733-0. PMID: 34312463; PMCID: PMC8313677.
16. Tewarie IA, Senders JT, Kremer S, Devi S, Gormley WB, Arnaout O, Smith TR, Broekman MLD. Survival prediction of glioblastoma patients-are we there yet? A systematic review of prognostic modeling for glioblastoma and its clinical potential. *Neurosurg Rev*. 2021 Aug;44(4):2047-2057. doi: 10.1007/s10143-020-01430-z. Epub 2020 Nov 6. PMID: 33156423; PMCID: PMC8338817.
17. Stopa BM, Harary M, Jhun R, Job A, Izzy S, Smith TR, Gormley WB. Divergence in the epidemiological estimates of traumatic brain injury in the United States: comparison of two national databases. *J Neurosurg*. 2020 Nov 20;135(2):584-593. doi: 10.3171/2020.7.JNS201896. PMID: 33254146.
18. Blitz SE, Bernstock JD, Dmytriw AA, Ditoro DF, Kappel AD, Gormley WB, Peruzzi P. Ruptured Suprasellar Dermoid Cyst Treated With Lumbar Drain to Prevent Postoperative Hydrocephalus: Case Report and Focused Review of Literature. *Front Surg*. 2021 Aug 11;8:714771. doi: 10.3389/fsurg.2021.714771. PMID: 34458316; PMCID: PMC8385128.
19. Lai PMR, Ng I, Gormley WB, Patel N, Frerichs KU, Aziz-Sultan MA, Du R. Cannabis Use and Increased Nonaneurysmal Subarachnoid Hemorrhage in the Past Decade. *World Neurosurg*. 2021 Oct;154. doi: 10.1016/j.wneu.2021.07.079. Epub 2021 Jul 27. PMID: 34325028.
20. Stopa BM, Tahir Z, Mezzalana E, Boaro A, Khawaja A, Grashow R, Zafonte RD, Smith TR, Gormley WB, Izzy S. The Impact of Age and Severity on Dementia After Traumatic Brain Injury: A Comparison Study. *Neurosurgery*. 2021 Oct 13;89(5):810-818. doi: 10.1093/neuros/nyab297. PMID: 34392366.
21. Senders JT, Maas SLN, Draaisma K, McNulty JJ, Ashby JL, Hofer I, van Solinge WW, Berg MT, Snijders TJ, Seute T, Robe PA, Gormley WB, Smith TR, Broekman MLD. International practice variation in perioperative laboratory testing in glioblastoma patients-a retrospective cohort study. *Acta Neurochir (Wien)*. 2022 Feb;164(2):385-392. doi: 10.1007/s00701-021-05090-w. Epub 2022 Jan 7. PMID: 34997355; PMCID: PMC8854260.
22. Stopa BM, Leyva OA, Harper CN, Truman KA, Corrales CE, Smith TR, Gormley WB. Decreased Incidence of CSF Leaks after Skull Base Fractures in the 21st Century: An Institutional Report. *J Neurol Surg B Skull Base*. 2020 Oct 16;83(1):59-65. doi: 10.1055/s-0040-1716689. PMID: 35155071; PMCID: PMC8824620.
23. Hulsbergen AFC, Siddi F, McAvoy M, Lynch BT, Karsten MB, Stopa BM, Ashby J, McNulty J, Broekman MLD, Gormley WB, Stone SSD, Warf BC, Proctor MR. The low utility of routine cranial imaging after pediatric shunt revision. *J Neurosurg Pediatr*. 2021 Nov 19;29(3):276-282. doi: 10.3171/2021.9.PEDS21261. PMID: 34798615.
24. Chawla S, Devi S, Calvachi P, Gormley WB, Rueda-Esteban R. Evaluation of simulation models in neurosurgical training according to face, content, and construct validity: a systematic review. *Acta Neurochir (Wien)*. 2022 Apr;164(4):947-966. doi: 10.1007/s00701-021-05003-x. Epub 2022 Feb 4. PMID: 35122126; PMCID: PMC8815386.
25. Lak AM, Cerecedo-Lopez CD, Cha J, Aziz-Sultan MA, Frerichs KU, Gormley WB, Mekary RA, Du R, Patel NJ. Seizure Outcomes After Interventional Treatment in Cerebral Arteriovenous Malformation-Associated Epilepsy: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2022 Apr;160. doi: 10.1016/j.wneu.2021.09.063. PMID: 35364673.
26. Robertson FC, Sha RM, Amich JM, Essayed W, Lal A, Lee BH, Calvachi Prieto P, Tokuda J, Weaver JC, Kirolos RW, Chen MW, Gormley WB. Frameless neuronavigation with computer vision and real-time tracking for bedside external ventricular drain placement: a cadaveric study. *J Neurosurg*. 2021 Oct 15;136(5):1475-1484. doi: 10.3171/2021.5.JNS211033. PMID: 34653985.
27. Ali AB, Khawaja AM, Reilly A, Tahir Z, Rao SS, Bernstock JD, Chen P, Molino J, Gormley W, Izzy S. Venous Thromboembolism Risk and Outcomes Following Decompressive Craniectomy in Severe Traumatic Brain Injury: An Analysis of the Nationwide Inpatient Sample Database. *World Neurosurg*. 2022 May;161. doi: 10.1016/j.wneu.2022.02.069. Epub 2022 Feb 20. PMID: 35196589.
28. Clark D, Joannides A, Adeleye AO, Bajamal AH, Bashford T, Biluts H, Budohoski K, Ercole A, Fernández-Méndez R, Figaji A, Gupta DK, Härtl R, Iaccarino C, Khan T, Laeke T, Rubiano A, Shabani HK, Sichizya K, Tewari M, Tirsit A, Thu M, Tripathi M, Trivedi R, Devi BI, Servadei F, Menon D, Koliass A, Hutchinson P; Global Neurotrauma Outcomes Study collaborative. Casemix, management, and mortality of patients receiving emergency neurosurgery for traumatic brain injury in the Global Neurotrauma Outcomes Study: a prospective observational cohort study. *Lancet Neurol*. 2022 May;21(5):438-449. doi: 10.1016/S1474-4422(22)00037-0. Epub 2022 Mar 16. PMID: 35305318.
29. Cerecedo-Lopez CD, Ng I, Nguyen HB, Lai PMR, Gormley WB, Patel N, Frerichs KU, Aziz-Sultan MA, Du R. Incidence and Outcomes of Registry-Based Acute Myocardial Infarction After Aneurysmal Subarachnoid Hemorrhage. *Neurocrit Care*. 2022 Jun;36(3):772-780. doi: 10.1007/s12028-021-01365-3. Epub 2021 Oct 25. PMID: 34697769.
30. Robertson FC, Wu KC, Sha RM, Amich JM, Lal A, Lee BH, Kirolos RW, Chen MW, Gormley WB. Stereotactic Neurosurgical Robotics With Real-Time Patient Tracking: A Cadaveric Study. *Oper Neurosurg (Hagerstown)*. 2022 Jun 1;22(6):425-432. doi: 10.1227/ons.0000000000000155. Epub 2022 Apr 14. PMID: 35867082.
31. Amadon S, Gormley WT, Claessens A, Magnuson K, Hummel-Price D, Romm K. Does early childhood education help to improve high school outcomes? Results from Tulsa. *Child Dev*. 2022 Jul;93(4). doi: 10.1111/cdev.13752. Epub 2022 Mar 18. PMID: 35302656.
32. Nawabi NLA, Stopa BM, Lassarén P, Mekary RA, Gormley W. Commentary: Response to "Systematic review and meta-analysis of external ventricular drain placement accuracy and narrative review of guidance devices". *J Clin Neurosci*. 2022 Dec;106:238-239. doi: 10.1016/j.jocn.2022.04.032. Epub 2022 May 9. PMID: 35537913.
33. Khawaja AM, McNulty J, Thakur UV, Chawla S, Devi S, Liew A, Mirshahi S, Du R, Mekary RA, Gormley W. Transcranial Doppler and computed tomography angiography for detecting cerebral vasospasm post-aneurysmal subarachnoid hemorrhage. *Neurosurg Rev*. 2022 Dec 6;46(1):3. doi: 10.1007/s10143-022-01913-1. PMID: 36471088.

34. Amadon S, Gormley WT, Claessens A, Magnuson K, Hummel-Price D, Romm K. Does early childhood education help to improve high school outcomes? Results from Tulsa. *Child Dev.* 2022 Jul;93(4). doi: 10.1111/cdev.13752. Epub 2022 Mar 18. PMID: 35302656.
35. Nawabi NLA, Stopa BM, Lassarén P, Mekary RA, Gormley W. Commentary: Response to "Systematic review and meta-analysis of external ventricular drain placement accuracy and narrative review of guidance devices". *J Clin Neurosci.* 2022 Dec;106:238-239. doi: 10.1016/j.jocn.2022.04.032. Epub 2022 May 9. PMID: 35537913.
36. Khawaja AM, McNulty J, Thakur UV, Chawla S, Devi S, Liew A, Mirshahi S, Du R, Mekary RA, Gormley W. Transcranial Doppler and computed tomography angiography for detecting cerebral vasospasm post-aneurysmal subarachnoid hemorrhage. *Neurosurg Rev.* 2022 Dec 6;46(1):3. doi: 10.1007/s10143-022-01913-1. PMID: 36471088.
37. Reilly AS, Khawaja AM, Ali AB, Madsen T, Molino-Bacic J, Heffernan DS, Zonfrillo MR, Vaitkevicius H, Gormley WB, Izzy S, Rao SS. Disparities in Decompressive Cranial Surgery Utilization in Severe Traumatic Brain Injury Patients without a Primary Extra-Axial Hematoma: A U.S. Nationwide Study. *World Neurosurg.* 2023 Jan;169. doi: 10.1016/j.wneu.2022.09.113. Epub 2022 Oct 4. PMID: 36202343.
38. Nawabi NLA, Stopa BM, Lassarén P, Bain PA, Mekary RA, Gormley WB. External ventricular drains and risk of freehand placement: A systematic review and meta-analysis. *Clin Neurol Neurosurg.* 2023 Aug;231:107852. doi: 10.1016/j.clineuro.2023.107852. Epub 2023 Jun 29. PMID: 37399698.
39. Dolmans RGF, Harary M, Nawabi N, Taros T, Kilgallon JL, Mekary RA, Izzy S, Dawood HY, Stopa BM, Broekman MLD, Gormley WB. External Ventricular Drains versus Intraparenchymal Pressure Monitors in the Management of Moderate to Severe Traumatic Brain Injury: Experience at Two Academic Centers over a Decade. *World Neurosurg.* 2023 Oct;178. doi: 10.1016/j.wneu.2023.07.037. Epub 2023 Jul 17. PMID: 37467955.
40. Zhao A, Varady S, O'Kelley-Bangsberg M, Deng V, Platenkamp A, Wijngaard P, Bern M, Gormley W, Kushkowsky E, Thompson K, Tibbetts L, Conner AT,

Noeckel D, Teran A, Ritz A, Applewhite DA. From network analysis to experimental validation: identification of regulators of non-muscle myosin II contractility using the folded-gastrulation signaling pathway. *BMC Mol Cell Biol.* 2023 Oct 11;24(1):32. doi: 10.1186/s12860-023-00492-3. PMID: 37821823; PMCID: PMC10568788.

41. Chiurillo I, Sha RM, Robertson FC, Liu J, Li J, Le Mau H, Amich JM, Gormley WB, Stolyarov R. High-Accuracy Neuro-Navigation with Computer Vision for Frameless Registration and Real-Time Tracking. *Bioengineering (Basel).* 2023 Dec 7;10(12):1401. doi: 10.3390/bioengineering10121401. PMID: 38135992; PMCID: PMC10740492.



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PUBLICATIONS

- Huang KT, Shen YL, Lee CN, Chu KY, Ku WC, Liu CY, Huang RS. Using Differential Threshold Effects of Individual and Combined Periconceptional Methyl Donor Status on Maternal Genomic LINE-1 and Imprinted H19 DNA Methylation to Predict Birth Weight Variance in the Taiwan Pregnancy-Newborn Epigenetics (TPNE) Cohort Study. *J Nutr.* 2020 Jan 1;150(1):108-117. doi: 10.1093/jn/nxz204. PMID: 31504733.
- Zhu GZ, Liao XW, Wang XK, Gong YZ, Liu XG, Yu L, Han CY, Yang CK, Su H, Huang KT, Yu TD, Huang JL, Li J, Zeng ZM, Qin W, Liu ZQ, Zhou X, Liu JQ, Lu L, Han QF, Shang LM, Ye XP, Peng T. Comprehensive investigation of p53, p21, nm23, and VEGF expression in hepatitis B virus-related hepatocellular carcinoma overall survival after hepatectomy. *J Cancer.* 2020 Jan 1;11(4):906-918. doi: 10.7150/jca.33766. PMID: 31949494; PMCID: PMC6959013.
- Hsu LW, Huang KT, Nakano T, Chiu KW, Chen KD, Goto S, Chen CL. MicroRNA-301a inhibition enhances the immunomodulatory functions of adipose-derived mesenchymal stem cells by induction of macrophage M2 polarization. *Int J Immunopathol Pharmacol.* 2020 Jan-Dec;34:2058738420966092. doi: 10.1177/2058738420966092. PMID: 33121303; PMCID: PMC7607751.
- Huang KT, Chen KD, Hsu LW, Kung CP, Li SR, Chen CC, Chiu KW, Goto S, Chen CL. Decreased PEDF Promotes Hepatic Fatty Acid Uptake and Lipid Droplet Formation in the Pathogenesis of NAFLD. *Nutrients.* 2020 Jan 20;12(1):270. doi: 10.3390/nu12010270. PMID: 31968655; PMCID: PMC7019565.
- Huang KT, Chen YC, Tseng CC, Chang HC, Su MC, Wang TY, Lin YY, Zheng YX, Chang JC, Chin CH, Hsiao CC, Lin MC. Aberrant DNA methylation of the toll-like receptors 2 and 6 genes in patients with obstructive sleep apnea. *PLoS One.* 2020 Feb 18;15(2). doi: 10.1371/journal.pone.0228958. PMID: 32069296; PMCID: PMC7028278.
- Huang KT. Exergaming Executive Functions: An Immersive Virtual Reality-Based Cognitive Training for Adults Aged 50 and Older. *Cyberpsychol Behav Soc Netw.* 2020 Mar;23(3):143-149. doi: 10.1089/cyber.2019.0269. Epub 2019 Dec 2. PMID: 31794673.

7. Taner T, Martins PN, Ling Q, Ng KT, Huang KT, Eymard C, Bhat M, Bonaccorsi-Riani E, Mas VR, Selzner M, Ekser B. What Is Hot and New in Basic and Translational Science in Liver Transplantation in 2019? Report of the Basic and Translational Research Committee of the International Liver Transplantation Society. *Transplantation*. 2020 Mar;104(3):516-521. doi: 10.1097/TP.0000000000003058. PMID: 31815901.
8. Chavakula V, Yan SC, Huang KT, Liu J, Bi WL, Rozman P, Chi JH. Subdural Pneumocephalus Aspiration Reduces Recurrence of Chronic Subdural Hematoma. *Oper Neurosurg (Hagerstown)*. 2020 Apr 1;18(4):391-397. doi: 10.1093/ons/ozz193. PMID: 31313813.
9. Huang KT, Lu Y. Commentary: Protocolization of Post-Transforaminal Lumbar Interbody Fusion Pain Control with Elimination of Benzodiazepines and Long-Acting Opioids. *Neurosurgery*. 2020 May 1;86(5). doi: 10.1093/neuros/nyz295. PMID: 31334551.
10. Moses ZB, Lee TC, Huang KT, Guenette JP, Chi JH. MRI-guided cryoablation for metastatic spine disease: intermediate-term clinical outcomes in 14 consecutive patients. *J Neurosurg Spine*. 2020 Jan 17;32(5):676-681. doi: 10.3171/2019.11.SPINE19808. PMID: 31952035.
11. Chen PL, Huang KT, Cheng CY, Li JC, Chan HY, Lin TY, Su MP, Yang WY, Chang HC, Wang HD, Chen CH. Vesicular transport mediates the uptake of cytoplasmic proteins into mitochondria in *Drosophila melanogaster*. *Nat Commun*. 2020 May 22;11(1):2592. doi: 10.1038/s41467-020-16335-0. PMID: 32444642; PMCID: PMC7244744.
12. Ho DR, Chang PJ, Lin WY, Huang YC, Lin JH, Huang KT, Chan WN, Chen CS. Beneficial Effects of Inflammatory Cytokine-Targeting Aptamers in an Animal Model of Chronic Prostatitis. *Int J Mol Sci*. 2020 May 31;21(11):3953. doi: 10.3390/ijms21113953. PMID: 32486412; PMCID: PMC7312664.
13. Chen YC, Huang KT, Su MC, Hsu PY, Chin CH, Lin IC, Liou CW, Wang TY, Lin YY, Hsiao CC, Lin MC. Aberrant DNA methylation levels of the formyl peptide receptor 1/2/3 genes are associated with obstructive sleep apnea and its clinical phenotypes. *Am J Transl Res*. 2020 Jun 15;12(6):2521-2537. PMID: 32655788; PMCID: PMC7344102.
14. Lin YP, Mukhtar H, Huang KT, Petway JR, Lin CM, Chou CF, Liao SW. Real-Time Identification of Irrigation Water Pollution Sources and Pathways with a Wireless Sensor Network and Blockchain Framework. *Sensors (Basel)*. 2020 Jun 28;20(13):3634. doi: 10.3390/s20133634. PMID: 32605303; PMCID: PMC7374519.
15. Shang LM, Liao XW, Zhu GZ, Huang KT, Han CY, Yang CK, Wang XK, Zhou X, Su H, Ye XP, Peng T. Genome-wide RNA-sequencing dataset reveals the prognostic value and potential molecular mechanisms of lncRNA in non-homologous end joining pathway 1 in early stage Pancreatic Ductal Adenocarcinoma. *J Cancer*. 2020 Jul 20;11(19):5556-5567. doi: 10.7150/jca.39888. PMID: 32913451; PMCID: PMC7477440.
16. Fang WF, Fang YT, Huang CH, Chen YM, Chang YC, Lin CY, Hung KY, Chang YT, Chen HC, Huang KT, Chang HC, Chen YC, Wang YH, Wang CC, Lin MC. Risk factors and associated outcomes of ventilator-associated events developed in 28 days among sepsis patients admitted to intensive care unit. *Sci Rep*. 2020 Jul 29;10(1):12702. doi: 10.1038/s41598-020-69731-3. PMID: 32728165; PMCID: PMC7391677.
17. Huang KT, Hsieh PS, Dai LG, Huang CJ. Complete zwitterionic double network hydrogels with great toughness and resistance against foreign body reaction and thrombus. *J Mater Chem B*. 2020 Aug 26;8(33):7390-7402. doi: 10.1039/d0tb01163k. PMID: 32657299.
18. Chiang CK, Loh JZ, Yang TH, Huang KT, Wu CT, Guan SS, Liu SH, Hung KY. Prevention of acute kidney injury by low intensity pulsed ultrasound via anti-inflammation and anti-apoptosis. *Sci Rep*. 2020 Aug 31;10(1):14317. doi: 10.1038/s41598-020-71330-1. PMID: 32868865; PMCID: PMC7459306.
19. Adak AK, Huang KT, Li PJ, Fan CY, Lin PC, Hwang KC, Lin CC. Regioselective SN2-Type Reaction for the Oriented and Irreversible Immobilization of Antibodies to a Glass Surface Assisted by Boronate Formation. *ACS Appl Bio Mater*. 2020 Oct 19;3(10):6756-6767. doi: 10.1021/acsabm.0c00700. Epub 2020 Sep 14. PMID: 35019340.
20. Yu TW, Chen YM, Wang CC, Lin CC, Huang KT, Liu YW, Hsu LW, Li WF, Chan YC, Chen CL, Chen CC. Incidence and Risk Factors of Alcohol Relapse after Liver Transplantation: Analysis of Pre-Transplant Abstinence and Psychosocial Features. *J Clin Med*. 2020 Nov 19;9(11):3716. doi: 10.3390/jcm9113716. PMID: 33228157; PMCID: PMC7699606.
21. Chen YM, Yu TW, Wang CC, Huang KT, Hsu LW, Lin CC, Liu YW, Li WF, Chen CL, Chen CC. Characteristics of Psychosocial Factors in Liver Transplantation Candidates with Alcoholic Liver Disease before Transplantation: A Retrospective Study in a Single Center in Taiwan. *Int J Environ Res Public Health*. 2020 Nov 23;17(22):8696. doi: 10.3390/ijerph17228696. PMID: 33238532; PMCID: PMC7700481.
22. Chen CM, Chung YP, Liu CH, Huang KT, Guan SS, Chiang CK, Wu CT, Liu SH. Withaferin A protects against endoplasmic reticulum stress-associated apoptosis, inflammation, and fibrosis in the kidney of a mouse model of unilateral ureteral obstruction. *Phytomedicine*. 2020 Dec;79:153352. doi: 10.1016/j.phymed.2020.153352. Epub 2020 Sep 21. PMID: 33007732.
23. Huang KT. Mapping the Hazard: Visual Analysis of Flood Impact on Urban Mobility. *IEEE Comput Graph Appl*. 2021 Jan-Feb;41(1):26-34. doi: 10.1109/MCG.2020.3041371. Epub 2021 Jan 14. PMID: 33253115.
24. Driver J, Huang KT, Krag M, Bydon M, Nunley P, Lavoie S, Lu Y, Stone M, Chi JH. One Year Outcomes From a Prospective Multicenter Investigation Device Trial of a Novel Conformal Mesh Interbody Fusion Device. *Spine (Phila Pa 1976)*. 2021 Jan 15;46(2). doi: 10.1097/BRS.0000000000003710. PMID: 32991515.
25. Chen KD, Hsu CN, Wu YJ, Chu CH, Huang KT, Tsai MC, Chiu KW, Cheng BC, Chiu CH, Chen CL, Lin CC. The Perioperatively Altered Neutrophil-to-Lymphocyte Ratio Associates with Impaired DNA Damage Response in Liver Transplantation Recipients with Hepatocellular Carcinoma. *Diagnostics (Basel)*. 2021 Jan 30;11(2):209. doi: 10.3390/diagnostics11020209. PMID: 33573309; PMCID: PMC7912615.
26. Lee Y, Huang KT, Blom R, Schriener R, Ciccarelli CA. To Believe or Not to Believe: Framing Analysis of Content and Audience Response of Top 10 Deepfake Videos on YouTube. *Cyberpsychol Behav Soc Netw*. 2021 Mar;24(3):153-158. doi: 10.1089/cyber.2020.0176. Epub 2021 Feb 17. PMID: 33600225.
27. Yang CP, Huang KT, Chang CM, Yang CC, Wang SJ. Acute Treatment of Migraine: What has Changed in Pharmacotherapies? *Neurol India*. 2021 Mar-Apr;69(Supplement). doi: 10.4103/0028-3886.315995. PMID: 34003146.
28. Lin HC, Huang KT, Lin HL, Uang YS, Ho Y, Keller JJ, Wang LH. Use of gastric acid-suppressive agents increases the risk of dementia in patients with upper gastrointestinal disease: A population-based retrospective cohort study. *PLoS One*. 2021 Mar 25;16(3). doi: 10.1371/journal.pone.0249050. PMID: 33765029; PMCID: PMC7993796.
29. Huang JL, Wang XK, Liao XW, Han CY, Yu TD, Huang KT, Yang CK, Liu XG, Yu L, Zhu GZ, Su H, Qin W, Han QF, Liu ZQ, Zhou X, Liu JQ, Ye XP, Peng T. SOX4 as biomarker in hepatitis B virus-associated hepatocellular carcinoma. *J Cancer*. 2021 Apr 19;12(12):3486-3500. doi: 10.7150/jca.46579. PMID: 33995626; PMCID: PMC8120190.
30. Ho DR, Su SH, Chang PJ, Lin WY, Huang YC, Lin JH, Huang KT, Chan WN, Chen CS. Biodegradable Stent with mTOR Inhibitor-Eluting Reduces Progression of Ureteral Stricture. *Int J Mol Sci*. 2021 May 26;22(11):5664. doi: 10.3390/ijms22115664. PMID: 34073521; PMCID: PMC8199408.
31. Tsai YH, Lin CY, Chen YM, Chang YP, Hung KY, Chang YC, Chen HC, Huang KT, Chen YC, Wang YH, Wang CC, Lin MC, Fang WF. Impact of Body Mass Index on the Survival of Patients with Sepsis with Different Modified NUTRIC Scores. *Nutrients*. 2021 May 30;13(6):1873. doi: 10.3390/nu13061873. PMID: 34070883; PMCID: PMC8226650.
32. Huang KT, Lu Y. Traumatic Spinal Cord Disorders: Current Topics and Future Directions. *Semin Neurol*. 2021 Jun;41(3):247-255. doi: 10.1055/s-0041-1725125. Epub 2021 May 19. PMID: 34010969.
33. Zhang H, Wang X, Huang KT, Liang F, Yang YW. Green Synthesis of Leaning Tower[6]arene-Mediated Gold Nanoparticles for Label-Free Detection. *Org Lett*. 2021 Jun 18;23(12):4677-4682. doi: 10.1021/acs.orglett.1c01300. Epub 2021 May 28. PMID: 34048268.
34. Takano T, Wahl AM, Huang KT, Narita T, Rugis J, Sneyd J, Yule DI. Highly localized intracellular Ca²⁺ signals promote optimal salivary gland fluid secretion. *Elife*. 2021 Jul 9;10. doi: 10.7554/eLife.66170. PMID: 34240705; PMCID: PMC8352588.
35. Gong YZ, Ma H, Ruan GT, Zhu LC, Liao XW, Wang S, Yan L, Huang W, Huang KT, Xie H, Zhu GZ, Wang XK, Liao C, Gao F. Diagnosis and prognostic value of C-X-C motif chemokine ligand 1 in colon adenocarcinoma based on The Cancer Genome Atlas and Guangxi cohort. *J Cancer*. 2021 Jul 25;12(18):5506-5518. doi: 10.7150/jca.51524. PMID: 34405013; PMCID: PMC8364656.
36. Lin SH, Wu KT, Wang CC, Huang KT, Chen KD, Lin CC, Hsu LW, Chiu KW. HCV RNA in serum and liver samples of patients undergoing living donor liver transplantation. *J Int Med Res*. 2021 Aug;49(8):3000605211034945. doi: 10.1177/03000605211034945. PMID: 34344219; PMCID: PMC8358508.
37. Hsu CY, Tsai YH, Lin CY, Chang YC, Chen HC, Chang YP, Chen YM, Huang KT, Wang YH, Wang CC, Lin MC, Fang WF. Application of a 72 h National Early Warning Score and Incorporation with Sequential Organ Failure Assessment for Predicting Sepsis Outcomes and Risk Stratification in an Intensive Care Unit: A Derivation and Validation Cohort Study. *J Pers Med*. 2021 Sep 13;11(9):910. doi: 10.3390/jpm11090910. PMID: 34575690; PMCID: PMC8465191.

38. Poganik JR, Huang KT, Parvez S, Zhao Y, Raja S, Long MJC, Aye Y. Wdr1 and cofilin are necessary mediators of immune-cell-specific apoptosis triggered by Tecfidera. *Nat Commun.* 2021 Sep 30;12(1):5736. doi: 10.1038/s41467-021-25466-x. PMID: 34593792; PMCID: PMC8484674.
39. Kohlschmidt N, Elbracht M, Czech A, Häusler M, Phan V, Töpf A, Huang KT, Bartok A, Eggermann K, Zippel S, Eggermann T, Freier E, Groß C, Lochmüller H, Horvath R, Hajnóczky G, Weis J, Roos A. Molecular pathophysiology of human MICU1 deficiency. *Neuropathol Appl Neurobiol.* 2021 Oct;47(6):840-855. doi: 10.1111/nan.12694. Epub 2021 Feb 22. PMID: 33428302.
40. Kuo SY, Chen PC, Huang KT, Huang CJ. Bio-inspired zwitterionic polymeric chelating assembly for treatment of copper-induced cytotoxicity and hemolysis. *Mater Sci Eng C Mater Biol Appl.* 2021 Oct;129:112367. doi: 10.1016/j.msec.2021.112367. Epub 2021 Aug 20. PMID: 34579886.
41. Chen YM, Lai CH, Lin CY, Tsai YH, Chang YC, Chen HC, Tseng CC, Chang HC, Huang KT, Chen YC, Fang WF, Wang CC, Chao TY, Lin MC. Body Mass Index, Weight Loss, and Mortality Risk in Advanced-Stage Non-Small Cell Lung Cancer Patients: A Focus on EGFR Mutation. *Nutrients.* 2021 Oct 24;13(11):3761. doi: 10.3390/nu13113761. PMID: 34836017; PMCID: PMC8622618.
42. Ma Z, Huang KT, Yao L. Feasibility of a Computer Role-Playing Game to Promote Empathy in Nursing Students: The Role of Immersiveness and Perspective. *Cyberpsychol Behav Soc Netw.* 2021 Nov;24(11):750-755. doi: 10.1089/cyber.2020.0371. Epub 2021 May 14. PMID: 33989057.
43. Chen CM, Lin CY, Chung YP, Liu CH, Huang KT, Guan SS, Wu CT, Liu SH. Protective Effects of Nootkatone on Renal Inflammation, Apoptosis, and Fibrosis in a Unilateral Ureteral Obstructive Mouse Model. *Nutrients.* 2021 Nov 1;13(11):3921. doi: 10.3390/nu13113921. PMID: 34836176; PMCID: PMC8621682.
44. Robinson L, Schulz J, Ball C, Chiaraluce C, Dodel M, Francis J, Huang KT, Johnston E, Khilnani A, Kleinmann O, Kwon KH, McClain N, Ng YMM, Pait H, Ragnedda M, Reisdorf BC, Ruiu ML, Xavier da Silva C, Trammel JM, Wiborg ØN, Williams AA. Cascading Crises: Society in the Age of COVID-19. *Am Behav Sci.* 2021 Nov;65(12):1608-1622. doi: 10.1177/00027642211003156. PMID: 38602993; PMCID: PMC8047508.
45. Long MJC, Huang KT, Aye Y. The not so identical twins: (dis)similarities between reactive electrophile and oxidant sensing and signaling. *Chem Soc Rev.* 2021 Nov 15;50(22):12269-12291. doi: 10.1039/d1cs00467k. PMID: 34779447.
46. Hsu K, Liu YY, Tseng WC, Huang KT, Liu CY, Chen LY, Lee HL, Lin HJ, Tseng KW, Yeh HI. Comodulation of NO-Dependent Vasodilation by Erythroid Band 3 and Hemoglobin: A GP.Mur Athlete Study. *Front Cardiovasc Med.* 2021 Nov 29;8:740100. doi: 10.3389/fcvm.2021.740100. PMID: 34912857; PMCID: PMC8666951.
47. Chang TJ, Hsia CY, Chau GY, Hsiao LT, Huang KT, King KL, Lui WY, Li AF, Wang CL, Tsai PH, Chien Y, Lin TH. Characterization of Androgen Receptor Complex Associated Protein (ARCAP) in hepatocellular carcinoma and liver. *J Chin Med Assoc.* 2021 Dec 1;84(12):1100-1108. doi: 10.1097/JCMA.0000000000000628. PMID: 34596084.
48. Wang CC, Lai CH, Chang YP, Chang HC, Tseng CC, Huang KT, Lin MC. Comparing survival and treatment response of patients with acquired T790M mutation second-line osimertinib versus sequential treatment of chemotherapy followed by osimertinib: A real-world study. *Thorac Cancer.* 2021 Dec;12(23):3263-3272. doi: 10.1111/1759-7714.14198. Epub 2021 Oct 26. PMID: 34704378; PMCID: PMC8636197.
49. Al-Mufti F, Ogulnick J, Feldstein E, Damodara N, Bravo M, Alshammari H, Dominguez J, Cooper J, Huang KT, Marikunte S, Ali S, Patel V, Khandelwal P, Mayer SA, Amuluru K, Gandhi CD. Impact of pre-ictal antiplatelet therapy use in aneurysmal subarachnoid hemorrhage. *Clin Neurol Neurosurg.* 2021 Dec;211:107022. doi: 10.1016/j.clineuro.2021.107022. Epub 2021 Nov 10. PMID: 34781219.
50. Kaur G, Damodara N, Feldstein E, Dominguez J, Huang KT, Ogulnick JV, Nuoman R, Khandelwal P, El-Ghanem M, Gupta G, Mayer SA, Amuluru K, Gandhi CD, Al-Mufti F. Relation between brain natriuretic peptide and delayed cerebral ischemia in patients with aneurysmal subarachnoid hemorrhage. *Clin Neurol Neurosurg.* 2021 Dec;211:107031. doi: 10.1016/j.clineuro.2021.107031. Epub 2021 Nov 14. PMID: 34837820.
51. Ball C, Huang KT, Francis J. Virtual reality adoption during the COVID-19 pandemic: A uses and gratifications perspective. *Telemat Inform.* 2021 Dec;65:101728. doi: 10.1016/j.tele.2021.101728. Epub 2021 Oct 13. PMID: 34887619; PMCID: PMC8520656.
52. Chi JH, Nunley PD, Huang KT, Krag MH, Bydon M, Lavoie S, Lu Y, Driver J, Stone MB. Two-Year Outcomes From a Prospective Multicenter Investigation Device Trial of a Novel Conformal Mesh Interbody Fusion Device. *Int J Spine Surg.* 2021 Dec;15(6):1103-1114. doi: 10.14444/8169. Epub 2022 Jan 25. PMID: 35086867; PMCID: PMC9541662.
53. Liu YH, Huang KT, Chen WC, Li YW, Ke WM, Ho BR, Hsu MC, Li YH, Shieh M. Structure-Property Relationships of Inorganic-Organic Hybrid Semiconducting Se-Fe-Cu-CO Polymers. *Inorg Chem.* 2021 Dec 6;60(23):18270-18282. doi: 10.1021/acs.inorgchem.1c02902. Epub 2021 Nov 12. PMID: 34767721.
54. Chen CC, Hsu LW, Chen KD, Chiu KW, Kung CP, Li SR, Chen CL, Huang KT. Emerging Roles of Calcium Signaling in the Development of Non-Alcoholic Fatty Liver Disease. *Int J Mol Sci.* 2021 Dec 27;23(1):256. doi: 10.3390/ijms23010256. PMID: 35008682; PMCID: PMC8745268.
55. Wang CC, Huang KT, Chang HC, Tseng CC, Lai CH, Lan J, Liu TT, Huang CC, Lin MC. Comprehensive analysis of PD-L1 in non-small cell lung cancer with emphasis on survival benefit, impact of driver mutation and histological types, and archival tissue. *Thorac Cancer.* 2022 Jan;13(1):38-47. doi: 10.1111/1759-7714.14216. Epub 2021 Nov 28. PMID: 34841687; PMCID: PMC8720620.
56. Chen YL, Chen YC, Wang HT, Chang YT, Fang YN, Hsueh S, Liu WH, Lin PT, Hsu PY, Su MC, Huang KT, Lin MC. The Impact of Intermittent Hypoxemia on Left Atrial Remodeling in Patients with Obstructive Sleep Apnea Syndrome. *Life (Basel).* 2022 Jan 20;12(2):148. doi: 10.3390/life12020148. PMID: 35207436; PMCID: PMC8874769.
57. Chang YC, Fang YT, Chen HC, Lin CY, Chang YP, Tsai YH, Chen YM, Huang KT, Chang HC, Wang CC, Lin MC, Fang WF. The Survival of Septic Patients with Compensated Liver Cirrhosis Is Not Inferior to That of Septic Patients without Liver Cirrhosis: A Propensity Score Matching Analysis. *J Clin Med.* 2022 Mar 15;11(6):1629. doi: 10.3390/jcm11061629. PMID: 35329955; PMCID: PMC8951259.
58. Adak AK, Huang KT, Liao CY, Lee YJ, Kuo WH, Huo YR, Li PJ, Chen YJ, Chen BS, Chen YJ, Chu Hwang K, Wayne Chang WS, Lin CC. Investigating a Boronate-Affinity-Guided Acylation Reaction for Labelling Native Antibodies. *Chemistry.* 2022 Mar 22;28(17). doi: 10.1002/chem.202104178. Epub 2022 Feb 19. PMID: 35143090.
59. Chen CC, Nakano T, Hsu LW, Chu CY, Huang KT. Early Lipid Metabolic Effects of the Anti-Psychotic Drug Olanzapine on Weight Gain and the Associated Gene Expression. *Neuropsychiatr Dis Treat.* 2022 Mar 23;18:645-657. doi: 10.2147/NDT.S345046. PMID: 35355504; PMCID: PMC8958728.
60. Lin SH, Wang CC, Huang KT, Chen KD, Hsu LW, Eng HL, Chiu KW. Liver Graft Pathology and Low Serum 25-Hydroxyvitamin D after Living Donor Liver Transplantation. *Metabolites.* 2022 Apr 25;12(5):388. doi: 10.3390/metabo12050388. PMID: 35629892; PMCID: PMC9147938.
61. Chen YC, Chang YP, Huang KT, Hsu PY, Hsiao CC, Lin MC. Unraveling the Pathogenesis of Asthma and Chronic Obstructive Pulmonary Disease Overlap: Focusing on Epigenetic Mechanisms. *Cells.* 2022 May 24;11(11):1728. doi: 10.3390/cells11111728. PMID: 35681424; PMCID: PMC9179497.
62. Chan WN, Chen CS, Ho DR, Huang YC, Lin JH, Huang KT, Liu YL. Pulmonary Embolism after Moderna Vaccination in Kidney Transplant Patients: Two Case Reports and Literature Review. *Vaccines (Basel).* 2022 May 29;10(6):868. doi: 10.3390/vaccines10060868. PMID: 35746476; PMCID: PMC9229759.
63. Huang KT, Wu CT, Chang Y, Ho FM, Chiang CK, Liu SH. Therapeutic effect of quercetin polymeric nanoparticles on ischemia/reperfusion-induced acute kidney injury in mice. *Biochem Biophys Res Commun.* 2022 Jun 11;608:122-127. doi: 10.1016/j.bbrc.2022.03.159. Epub 2022 Apr 4. PMID: 35397424.
64. Paillard M, Huang KT, Weaver D, Lambert JP, Elrod JW, Hajnóczky G. Altered composition of the mitochondrial Ca²⁺ uniporter in the failing human heart. *Cell Calcium.* 2022 Jul;105:102618. doi: 10.1016/j.ceca.2022.102618. Epub 2022 Jun 22. PMID: 35779476; PMCID: PMC10446164.
65. Lin CY, Wang YH, Chen YM, Hung KY, Chang YC, Fang YT, Chang YT, Chen HC, Huang KT, Chang HC, Chen YC, Wang CC, Lin MC, Fang WF. Dynamic monitoring of kidney injury status over 3 days in the intensive care unit as a sepsis phenotype associated with hospital mortality and hyperinflammation. *Biomed J.* 2022 Aug;45(4):665-674. doi: 10.1016/j.bj.2021.08.006. Epub 2021 Sep 3. PMID: 34482015; PMCID: PMC9486242.
66. Huang A, Huang SY, Shah P, Ku WC, Huang KT, Liu YF, Su CL, Huang RS. Suboptimal folic acid exposure rewires oncogenic metabolism and proteomics signatures to mediate human breast cancer malignancy. *J Nutr Biochem.* 2022 Aug;106:109000. doi: 10.1016/j.jnutbio.2022.109000. Epub 2022 Apr 20. PMID: 35460832.

67. Lin SH, Wu KT, Wang CC, Huang KT, Chen KD, Hsu LW, Eng HL, Chiu KW. Liver Graft MicroRNAs Expression in Different Etiology of Acute Jaundice after Living Donor Liver Transplantation. *Biology (Basel)*. 2022 Aug 17;11(8):1228. doi: 10.3390/biology11081228. PMID: 36009855; PMCID: PMC9404977.
68. Huang SP, Lin YY, Kuo YS, Huang YF, Wu SC, Huang KT, Lu CH, Chiu PW, Lin IC, Chang YH, Chin CW, Chang HC, Lin CH. Adequacy of care during interfacility transfer in Taiwan: A pilot study. *J Formos Med Assoc*. 2022 Sep;121(9):1864-1871. doi: 10.1016/j.jfma.2022.03.018. Epub 2022 Apr 7. PMID: 35400581.
69. DU Y, Wang ZW, Xi JH, Li JY, Liang KK, Huang KT, Luo HY. [Effects of Angelicae Sinensis Radix on cAMP/Epac signaling pathway in the treatment of chronically infected cough mice with Yin deficiency syndrome]. *Zhongguo Ying Yong Sheng Li Xue Za Zhi*. 2022 Sep;38(5):475-479. Chinese. doi: 10.12047/j.cjap.6296.2022.089. PMID: 37088755.
70. Van Hall-Beauvais A, Poganik JR, Huang KT, Parvez S, Zhao Y, Lin HY, Liu X, Long MJC, Aye Y. Z-REX uncovers a bifurcation in function of Keap1 paralogs. *Elife*. 2022 Oct 27;11. doi: 10.7554/eLife.83373. PMID: 36300632; PMCID: PMC9754640.
71. Lin KC, Fang WF, Sung PH, Huang KT, Chiang JY, Chen YL, Huang CR, Li YC, Lee MS, Yip HK. Early and Dose-Dependent Xenogeneic Mesenchymal Stem Cell Therapy Improved Outcomes in Acute Respiratory Distress Syndrome Rodent Through Ameliorating Inflammation, Oxidative Stress, and Immune Reaction. *Cell Transplant*. 2023 Jan-Dec;32:9636897231190178. doi: 10.1177/09636897231190178. PMID: 37592717; PMCID: PMC10469224.
72. Weber DS, Huang KT, See AP. Fractal analysis of healthy and diseased vasculature in pediatric Moyamoya disease. *Interv Neuroradiol*. 2023 Jan 26:15910199231152513. doi: 10.1177/15910199231152513. Epub ahead of print. PMID: 36703285.
73. Huang KT, Poganik JR, Parvez S, Raja S, Miller B, Long MJC, Fetcho JR, Aye Y. Z-REX: shepherding reactive electrophiles to specific proteins expressed tissue specifically or ubiquitously, and recording the resultant functional electrophile-induced redox responses in larval fish. *Nat Protoc*. 2023 May;18(5):1379-1415. doi: 10.1038/s41596-023-00809-8. Epub 2023 Apr 5. Erratum in: *Nat Protoc*. 2023 Oct;18(10):3155. doi: 10.1038/s41596-023-00858-z. PMID: 37340167; PMCID: PMC11150335.
74. Emani S, Swaminathan A, Grobman B, Duvall JB, Lopez I, Arnaout O, Huang KT. Critically reading machine learning literature in neurosurgery: a reader's guide and checklist for appraising prediction models. *Neurosurg Focus*. 2023 Jun;54(6). doi: 10.3171/2023.3.FOCUS2352. PMID: 37283326.
75. Huang KT, Ly P, Poganik JR, Parvez S, Long MJC, Aye Y. Monitoring On-Target Signaling Responses in Larval Zebrafish - Z-REX Unmasks Precise Mechanisms of Electrophilic Drugs and Metabolites. *J Vis Exp*. 2023 Jun 2;(196). doi: 10.3791/64846. PMID: 37335096.
76. Rodríguez-Prados M, Huang KT, Márta K, Paillard M, Csordás G, Joseph SK, Hajnóczky G. MICU1 controls the sensitivity of the mitochondrial Ca²⁺ uniporter to activators and inhibitors. *Cell Chem Biol*. 2023 Jun 15;30(6):606-617.e4. doi: 10.1016/j.chembiol.2023.05.002. Epub 2023 May 26. PMID: 37244260; PMCID: PMC10370359.
77. Chang YP, Huang GK, Chen YC, Huang KT, Chen YM, Lin CY, Huang CC, Lin MC, Wang CC. E-cadherin expression in the tumor microenvironment of advanced epidermal growth factor receptor-mutant lung adenocarcinoma and the association with prognosis. *BMC Cancer*. 2023 Jun 20;23(1):569. doi: 10.1186/s12885-023-10980-6. PMID: 37340370; PMCID: PMC10283306.
78. Huang CL, Huang KT, Lee TM. The biological responses of osteoblasts on titanium: Effect of oxygen level and surface roughness. *J Formos Med Assoc*. 2023 Jul;122(7):584-592. doi: 10.1016/j.jfma.2023.01.009. Epub 2023 Jan 31. PMID: 36732135.
79. Ku YL, Tang MH, Chen SM, Kuo WY, Huang KT. Delirium Care by Intensive Care Unit Nurses: Focus Group Studies in a Medical Center of Southern Taiwan. *Dimens Crit Care Nurs*. 2023 Sep-Oct 01;42(5):255-262. doi: 10.1097/DCC.0000000000000568. PMID: 37523724.
80. Huang KT, Poganik JR, Parvez S, Raja S, Miller B, Long MJC, Fetcho JR, Aye Y. Author Correction: Z-REX: shepherding reactive electrophiles to specific proteins expressed tissue specifically or ubiquitously, and recording the resultant functional electrophile-induced redox responses in larval fish. *Nat Protoc*. 2023 Oct;18(10):3155. doi: 10.1038/s41596-023-00858-z. PMID: 37340167.
81. Chaudhari P, Chau LK, Ngo LT, Chang TC, Chen YL, Huang KT. Competitive Assay for the Ultrasensitive Detection of Organophosphate Pesticides Based on a Fiber-Optic Particle Plasmon Resonance Biosensor and an Acetylcholinesterase Binding Peptide. *Anal Chem*. 2023 Oct 3;95(39):14600-14607. doi: 10.1021/acs.analchem.3c01960. Epub 2023 Sep 19. PMID: 37726976.
82. Chang HC, Huang KT, Tseng CC, Chen YM, Lai CH, Chang YP, Chen YC, Chuang HY, Wang CC. Survival outcomes of east Asian patients with advanced non-small cell lung cancer treated with first-line EGFR tyrosine kinase inhibitors: A network meta-analysis of real-world evidence. *Thorac Cancer*. 2023 Nov;14(32):3217-3225. doi: 10.1111/1759-7714.15112. Epub 2023 Sep 13. PMID: 37704454; PMCID: PMC10643793.
83. Chang HC, Wang CC, Tseng CC, Huang KT, Chen YM, Chang YP, Lai CH, Fang WF, Lin MC, Chuang HY. Do patient characteristics affect EGFR tyrosine kinase inhibitor treatment outcomes? A network meta-analysis of real-world survival outcomes of East Asian patients with advanced non-small cell lung cancer treated with first-line EGFR-TKIs. *Thorac Cancer*. 2023 Nov;14(32):3208-3216. doi: 10.1111/1759-7714.15111. Epub 2023 Sep 22. PMID: 37737541; PMCID: PMC10643796.
84. Anil Kumar Vaidhyam S, Huang KT. Social Determinants of Health and Patients' Technology Acceptance of Telehealth During the COVID-19 Pandemic: Pilot Survey. *JMIR Hum Factors*. 2023 Nov 7;10. doi: 10.2196/47982. PMID: 37934556; PMCID: PMC10631497.
85. Lan L, Yang Y, Xu ZQ, Jin XC, Huang KT, Chen YX, Yang CX, Zhou M. Clinical Evaluation of Cystic Renal Masses With Bosniak Classification by Contrast-Enhanced Ultrasound and Contrast-Enhanced Computer Tomography. *J Ultrasound Med*. 2023 Dec;42(12):2845-2858. doi: 10.1002/jum.16324. Epub 2023 Sep 21. PMID: 37732901.
86. Chen PL, Huang KT, Chen LY, Hsu K. Erythroid anion Exchanger-1 (band 3) transports nitrite for nitric oxide metabolism. *Free Radic Biol Med*. 2024 Jan;210:237-245. doi: 10.1016/j.freeradbiomed.2023.11.028. Epub 2023 Nov 30. PMID: 38042224.
87. Son GY, Zou A, Wahl A, Huang KT, Vinu M, Zorgit S, Zhou F, Wagner L, Idaghdour Y, Yule DI, Feske S, Lacruz RS. Loss of STIM1 and STIM2 in salivary glands disrupts ANO1 function but does not induce Sjogren's disease. *bioRxiv [Preprint]*. 2024 Jan 8:2024.01.08.574702. doi: 10.1101/2024.01.08.574702. Update in: *Function (Oxf)*. 2024 Oct 30. doi: 10.1093/function/zqae047. PMID: 38260625; PMCID: PMC10802497.
88. Mori MP, Lozoya O, Brooks AM, Grenet D, Nadalutti CA, Ryback B, Huang KT, Hasan P, Hajnóczky G, Santos JH. Mitochondrial membrane potential regulates nuclear DNA methylation and gene expression through phospholipid remodeling. *bioRxiv [Preprint]*. 2024 Jan 13:2024.01.12.575075. doi: 10.1101/2024.01.12.575075. PMID: 38260521; PMCID: PMC10802563.
89. Lin SH, Wu KT, Wang CC, Huang KT, Hsu LW, Eng HL, Chiu KW. Immune Responses to Anti-Hepatitis C Virus Antibodies during Pre-Liver Transplantation Direct-Acting Antiviral Therapy in Hepatitis C Virus-Infected Recipients Associated with Post-Liver Transplantation Allograft Injury. *Antibodies (Basel)*. 2024 Jan 16;13(1):7. doi: 10.3390/antib13010007. PMID: 38247571; PMCID: PMC10801541.
90. Li A, Ling L, Qin H, Arabi YM, Myatra SN, Egi M, Kim JH, Nor MBM, Son DN, Fang WF, Wahyuprajitno B, Hashmi M, Faruq MO, Patjanasontorn B, Al Bahrani MJ, Shrestha BR, Shrestha U, Nafees KMK, Sann KK, Palo JEM, Mendsaikhan N, Konkayev A, Detleuxay K, Chan YH, Du B, Divatia JV, Koh Y, Phua J; MOSAICS II Study Group; Asian Critical Care Clinical Trials Group. Prognostic evaluation of quick sequential organ failure assessment score in ICU patients with sepsis across different income settings. *Crit Care*. 2024 Jan 23;28(1):30. doi: 10.1186/s13054-024-04804-7. PMID: 38263076; PMCID: PMC10804657.
91. Yang CK, Huang KT, Qin W, Wu QY, Huang XL, Peng K, Lao Q, Ye XP, Zhu GZ, Li TM, Peng T. Prognostic value of geriatric nutritional risk index and prognostic nutritional index in hepatocellular carcinoma. *Clin Nutr ESPEN*. 2024 Feb;59:355-364. doi: 10.1016/j.clnesp.2023.12.148. Epub 2023 Dec 30. PMID: 38220397.
92. Chang YP, Tsai YH, Chen YM, Huang KT, Lee CP, Hsu PY, Chen HC, Lin MC, Chen YC. Upregulated microRNA-125b-5p in patients with asthma-COPD overlap mediates oxidative stress and late apoptosis via targeting IL6R/TRIAP1 signaling. *Respir Res*. 2024 Feb 1;25(1):64. doi: 10.1186/s12931-024-02703-7. PMID: 38302925; PMCID: PMC10835813.
93. Lo CM, Chen WH, Tsai MY, Lu HI, Hsiao YH, Chuang KH, Chen Y, Wu HF, Huang KT, Wang YH. A case report of drug interaction between co-packaged nirmatrelvir-ritonavir and tacrolimus causing hyponatremia in a lung transplant recipient. *J Cardiothorac Surg*. 2024 Mar 15;19(1):132. doi: 10.1186/s13019-024-02599-w. PMID: 38491538; PMCID: PMC10941613.
94. Fang YC, Cheng WH, Lu HI, Wang YS, Chuang KH, Lai HH, Chen Y, Chen LC, Tsai MY, Chang YP, Huang KT, Lo CM. Double lung transplantation is better than single lung transplantation for end-stage chronic obstructive pulmonary disease: a meta-analysis. *J Cardiothorac Surg*. 2024 Mar 30;19(1):162. doi: 10.1186/s13019-024-02654-6. PMID: 38555450; PMCID: PMC10981328.

95. Fang YC, Cheng WH, Lu HI, Wang YS, Chuang KH, Lai HH, Chen Y, Chen LC, Tsai MY, Chang YP, Huang KT, Lo CM. Double lung transplantation is better than single lung transplantation for end-stage chronic obstructive pulmonary disease: a meta-analysis. *J Cardiothorac Surg.* 2024 Mar 30;19(1):162. doi: 10.1186/s13019-024-02654-6. PMID: 38555450; PMCID: PMC10981328.

96. Amani Room S, Huang KT, Pan SY, Chen PJ, Hsu YC, Chi KH. Health assessment of emerging persistent organic pollutants (POPs) in PM2.5 in northern and central Taiwan. *Chemosphere.* 2024 Apr;353:141573. doi: 10.1016/j.chemosphere.2024.141573. Epub 2024 Feb 28. PMID: 38428532.

97. Huang KT, Mehta NH, Gupta S, See AP, Arnaout O. Evaluation of the safety, accuracy, and helpfulness of the GPT-4.0 Large Language Model in neurosurgery. *J Clin Neurosci.* 2024 May;123:151-156. doi: 10.1016/j.jocn.2024.03.021. Epub 2024 Apr 4. PMID: 38574687.

98. Lee LC, Huang KT, Lin YT, Jeng US, Wang CH, Tung SH, Huang CJ, Liu CL. A pH-Sensitive Stretchable Zwitterionic Hydrogel with Bipolar Thermoelectricity. *Small.* 2024 Jun;20(24). doi: 10.1002/sml.202311811. Epub 2024 Feb 19. PMID: 38372500.

99. Chen JY, Huang KT, Yau S, Huang CJ. Rationale Design for Anchoring Pendant Groups of Zwitterionic Polymeric Medical Coatings. *Langmuir.* 2024 Jun 25;40(25):13236-13246. doi: 10.1021/acs.langmuir.4c01395. Epub 2024 Jun 12. PMID: 38864376; PMCID: PMC11210289.

100. Huang KT, Wagner LE, Takano T, Lin XX, Bagavant H, Deshmukh U, Yule DI. Dysregulated Ca²⁺ signaling, fluid secretion, and mitochondrial function in a mouse model of early Sjögren's syndrome. *bioRxiv [Preprint].* 2024 Jun 26:2024.03.19.585719. doi: 10.1101/2024.03.19.585719. Update in: *Elife.* 2024 Sep 11;13. doi: 10.7554/eLife.97069. PMID: 38562738; PMCID: PMC10983907.

101. Chen CC, Hsu LW, Chen KD, Chiu KW, Kung CP, Li SR, Chen CL, Huang KT. Calreticulin regulates hepatic stellate cell activation through modulating TGF-beta-induced Smad signaling. *Cell Calcium.* 2024 Jul;121:102895. doi: 10.1016/j.ceca.2024.102895. Epub 2024 Apr 30. PMID: 38703416.

102. Chang YW, Tsai MY, Chang YP, Liao CC, Lin YT, Lai CH, Lin MC, Huang KT. Enhancing Outcomes in Chronic Fibrotic Interstitial Lung Disease Through Aggressive Management of Nintedanib-Induced Adverse Drug Reactions: A Retrospective Analysis. *Drugs Real World Outcomes.* 2024 Sep;11(3):521-527. doi: 10.1007/s40801-024-00443-0. Epub 2024 Aug 5. PMID: 39102100; PMCID:

PMC11365896.

103. Huang KT, Aye Y. Toward decoding spatiotemporal signaling activities of reactive immunometabolites with precision immuno-chemical biology tools. *Commun Chem.* 2024 Sep 2;7(1):195. doi: 10.1038/s42004-024-01282-4. PMID: 39223329; PMCID: PMC11369232.

104. Huang KT, Wagner LE, Takano T, Lin XX, Bagavant H, Deshmukh U, Yule DI. Dysregulated Ca²⁺ signaling, fluid secretion, and mitochondrial function in a mouse model of early Sjögren's disease. *Elife.* 2024 Sep 11;13. doi: 10.7554/eLife.97069. PMID: 39259200; PMCID: PMC11390111.

105. Huang KT, McNulty J, Hussein H, Klinger N, Chua MMJ, Ng PR, Chalif J, Mehta NH, Arnaout O. Automated ventricular segmentation and shunt failure detection using convolutional neural networks. *Sci Rep.* 2024 Sep 27;14(1):22166. doi: 10.1038/s41598-024-73167-4. PMID: 39333724; PMCID: PMC11436930.

106. Tseng CC, Hung KY, Chang HC, Huang KT, Wang CC, Chen YM, Lin CY, Lin MC, Fang WF. The importance of high total body water/fat free mass ratio and serial changes in body composition for predicting hospital mortality in patients with severe pneumonia: a prospective cohort study. *BMC Pulm Med.* 2024 Sep 27;24(1):470. doi: 10.1186/s12890-024-03302-4. PMID: 39333963; PMCID: PMC11437920.

107. Huang KT, Tsai HI, Kao SC. Supra-inguinal fascia iliaca block versus peri-capsular nerve group (PNEG) block for pain management in patients with hip fracture: A double-blind randomised comparative trial. *Injury.* 2024 Oct 8;55(12):111936. doi: 10.1016/j.injury.2024.111936. Epub ahead of print. PMID: 39405739.

108. Habboub G, Huang KT, Shost MD, Meade S, Shah AK, Lapin B, Patel AA, Salas-Vega S, Sundar SJ, Steinmetz MP, Mroz TE. Using Resource Utilization in Spine Healthcare to Complement Patient-Reported Outcome Measurements in Assessing Surgical Success. *World Neurosurg.* 2024 Oct 14(24):01712-1. doi: 10.1016/j.wneu.2024.10.019. Epub ahead of print. PMID: 39414142.

109. Son GY, Zou A, Wahl A, Huang KT, Zorgit S, Vinu M, Zhou F, Wagner L, Idaghdour Y, Yule DI, Feske S, Lacruz RS. Loss of STIM1 and STIM2 in salivary glands disrupts ANO1 function but does not induce Sjogren's disease. *Function (Oxf).* 2024 Oct 30. doi: 10.1093/function/zqae047. Epub ahead of print. PMID: 39479800.



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minimally invasive surgery, myelopathy, peripheral
nerve disease, scoliosis, slipped disc, spinal cord
injury, spinal cord tumors, spinal deformity, spinal
disorders, spinal fracture reconstruction, spinal
fusion, spine tumors, spondylolisthesis, tethered
cord, thoracic outlet syndrome

PUBLICATIONS

- Lak AM, Rahimi A, Abunimer AM, Tafel I, Devi S, Premkumar A, Ida F, Lu Y, Chi JH, Tanguturi S, Groff MW, Zaidi HA. Quantifying the impact of surgical decompression on quality of life and identification of factors associated with outcomes in patients with symptomatic metastatic spinal cord compression. *J Neurosurg Spine.* 2020 Apr 3:1-8. doi: 10.3171/2020.1.SPINE191326. Epub ahead of print. PMID: 32244218.
- Lu T, Lu Y. Interlaminar stabilization offers greater biomechanical advantage compared to interspinous stabilization after lumbar decompression: a finite element analysis. *J Orthop Surg Res.* 2020 Jul 29;15(1):291. doi: 10.1186/s13018-020-01812-5. PMID: 32727615; PMCID: PMC7392677.
- Huynh MA, Roldan C, Nunes P, Kelly A, Taylor A, Richards C, Fareed MM, Gorman D, Groff M, Ferrone M, Lu Y, Chi JH, Spektor A, Balboni T. Characteristics of patients and treatment recommendations from a multidisciplinary spinal tumor program, Palliative Medicine Reports 1:1, 1-6, DOI: 10.1089/pmr.2020.0070.
- Boaro A, Wells M, Chi J, Lu Y, Smith TR, Groff MW, Zaidi H. A National Surgical Quality Improvement Program Analysis of Postoperative Major and Minor Complications in Patients with Spinal Metastatic Disease. *World Neurosurg.* 2020 Aug;140. doi: 10.1016/j.wneu.2020.04.225. Epub 2020 May 8. PMID: 32389869.
- Lak AM, Abunimer AM, Rahimi A, Tafel I, Chi J, Lu Y, Groff M, Zaidi HA. Outcomes of Minimally Invasive versus Open Surgery for Intermediate to High-grade Spondylolisthesis: A 10-Year Retrospective, Multicenter Experience. *Spine (Phila Pa 1976).* 2020 Oct 15;45(20):1451-1458. doi: 10.1097/BRS.0000000000003573. PMID: 32453240.
- Huang KT, Lu Y. Commentary: Protocolization of Post-Transforaminal Lumbar Interbody Fusion Pain Control with Elimination of Benzodiazepines and Long-Acting Opioids. *Neurosurgery.* 2020 May 1;86(5). doi: 10.1093/neuros/nyz295. PMID: 31334551.
- Fan G, Liu H, Wang D, Feng C, Li Y, Yin B, Zhou Z, Gu X, Zhang H, Lu Y, He S. Deep learning-based lumbosacral reconstruction for difficulty prediction of percutaneous endoscopic transforaminal discectomy at L5/S1 level: A retrospective cohort study. *Int J Surg.* 2020 Oct;82:162-169. doi: 10.1016/j.ijsu.2020.08.036. Epub 2020 Sep 1. PMID: 32882401.

8. Rezvan M, Meknatkhan S, Hassannejad Z, Sharif-Alhoseini M, Zadegan SA, Shokraneh F, Vaccaro AR, Lu Y, Rahimi-Movaghar V. Time-dependent microglia and macrophages response after traumatic spinal cord injury in rat: a systematic review. *Injury*. 2020 Nov;51(11):2390-2401. doi: 10.1016/j.injury.2020.07.007. Epub 2020 Jul 7. PMID: 32665068.
9. Susano MJ, Grasfield RH, Friese M, Rosner B, Crosby G, Bader AM, Kang JD, Smith TR, Lu Y, Groff MW, Chi JH, Grodstein F, Culley DJ. Brief Preoperative Screening for Frailty and Cognitive Impairment Predicts Delirium after Spine Surgery. *Anesthesiology*. 2020 Dec 1;133(6):1184-1191. doi: 10.1097/ALN.0000000000003523. PMID: 32898243; PMCID: PMC7657972.
10. Driver J, Huang KT, Krag M, Bydon M, Nunley P, Lavoie S, Lu Y, Stone M, Chi JH. One Year Outcomes From a Prospective Multicenter Investigation Device Trial of a Novel Conformal Mesh Interbody Fusion Device. *Spine (Phila Pa 1976)*. 2021 Jan 15;46(2). doi: 10.1097/BRS.0000000000003710. PMID: 32991515.
11. Kappel AD, Bernstock JD, Ditoro DF, Lu Y. Radiation-induced intracranial osteosarcoma of the anterior skull base after treatment of esthesioneuroblastoma. *BMJ Case Rep*. 2021 Jan 18;14(1). doi: 10.1136/bcr-2020-238928. PMID: 33462035; PMCID: PMC7813314.
12. Miskin N, Isaac Z, Lu Y, Makhni MC, Sarno DL, Smith TR, Zampini JM, Mandell JC. Simplified Universal Grading of Lumbar Spine MRI Degenerative Findings: Inter-reader agreement of non-radiologist spine experts. *Pain Med*. 2021 Mar 13. doi: 10.1093/pm/pnab098. Epub ahead of print. PMID: 33713135.
13. Huang KT, Lu Y. Traumatic Spinal Cord Disorders: Current Topics and Future Directions. *Semin Neurol*. 2021 Jun;41(3):247-255. doi: 10.1055/s-0041-1725125. Epub 2021 May 19. PMID: 34010969.
14. Calvachi-Prieto P, McAvoy MB, Cerecedo-Lopez CD, Lu Y, Chi JH, Aglio LS, Smith TR, Gormley WB, Groff MW, Mekary RA, Zaidi HA. Expandable Versus Static Cages in Minimally Invasive Lumbar Interbody Fusion: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2021 Jul;151. doi: 10.1016/j.wneu.2021.04.090. Epub 2021 Apr 30. PMID: 33940268.
15. Hauser BM, Gupta S, Hoffman SE, Zaki MM, Roffler AA, Cote DJ, Lu Y, Chi JH, Groff MW, Khawaja AM, Smith TR, Zaidi HA. Adult sports-related traumatic spinal injuries: do different activities predispose to certain injuries? *J Neurosurg Spine*. 2021 Aug 24:1-7. doi: 10.3171/2021.1.SPINE201860. Epub ahead of print. PMID: 35354117.
16. Lak, A., Siddi, F., Ida, F., Zaidi, H., Smith, T., & Lu, Y. Failure to achieve pelvic balance following hip replacement surgery may be a risk factor for development of degenerative scoliosis. *Interdisciplinary Neurosurgery*, 25, 101242.
17. Hoffman SE, Gupta S, Huang K, Klinger N, Lu Y. Three-dimensional Navigation-guided, Prone, Single-position, Lateral Lumbar Interbody Fusion Technique. *J Vis Exp*. 2021 Jul 15;(173). doi: 10.3791/62662. PMID: 34338679.
18. Boaro A, Leung J, Reeder HT, Siddi F, Mezzalana E, Liu G, Mekary RA, Lu Y, Groff MW, Onnela JP, Smith TR. Smartphone GPS signatures of patients undergoing spine surgery correlate with mobility and current gold standard outcome measures. *J Neurosurg Spine*. 2021 Aug 27;35(6):796-806. doi: 10.3171/2021.2.SPINE202181. PMID: 34450590; PMCID: PMC9012532.
19. Cerecedo-Lopez CD, Bernstock JD, Dmytriw AA, Chen JA, Chalif JI, Gupta S, Driver J, Huang K, Stanley SE, Li JZ, Chi J, Lu Y. Spontaneous intramedullary abscesses caused by *Streptococcus anginosus*: two case reports and review of the literature. *BMC Infect Dis*. 2022 Feb 10;22(1):141. doi: 10.1186/s12879-022-07099-7. PMID: 35144555; PMCID: PMC8830018.
20. Blitz SE, Kappel AD, Gessler FA, Klinger NV, Arnaout O, Lu Y, Peruzzi PP, Smith TR, Chiocca EA, Friedman GK, Bernstock JD. Tumor-Associated Macrophages/Microglia in Glioblastoma Oncolytic Virotherapy: A Double-Edged Sword. *Int J Mol Sci*. 2022 Feb 4;23(3):1808. doi: 10.3390/ijms23031808. PMID: 35163730; PMCID: PMC8836356.
21. Hauser BM, McNulty J, Zaki MM, Gupta S, Cote DJ, Bernstock JD, Lu Y, Chi JH, Groff MW, Khawaja AM, Smith TR, Zaidi HA. Predictors of thoracic and lumbar spine injuries in patients with TBI: A nationwide analysis. *Injury*. 2022 Mar;53(3):1087-1093. doi: 10.1016/j.injury.2021.09.060. Epub 2021 Oct 2. PMID: 34625238; PMCID: PMC8863622.
22. Chua MMJ, Vasudeva VS, Lu Y. Intraoperative Ultrasound in Spinal Surgery. *J Vis Exp*. 2022 Aug 17;(186). doi: 10.3791/58080. PMID: 36062998.
23. Yousefifard M, Askarian-Amiri S, Nasser Maleki S, Rafiei Alavi SN, Madani Neishaboori A, Haghani L, Vaccaro AR, Harrop JS, Lu Y, Rahimi-Movaghar V, Hosseini M. Combined application of neural stem/progenitor cells and scaffolds on locomotion recovery following spinal cord injury in rodents: a systematic review and meta-analysis. *Neurosurg Rev*. 2022 Sep 17. doi: 10.1007/s10143-022-

01859-4. Epub ahead of print. PMID: 36114918.

24. Expert Panel on Musculoskeletal Imaging, Stanborough R, Demertzis JL, Wessell DE, Lenchik L, Ahlawat S, Baker JC, Banks J, Caracciolo JT, Garner HW, Hentz C, Lewis VO, Lu Y, Maynard JR, Pierce JL, Scott JA, Sharma A, Beaman FD. ACR Appropriateness Criteria® Malignant or Aggressive Primary Musculoskeletal Tumor-Staging and Surveillance: 2022 Update. *J Am Coll Radiol*. 2022 Nov;19(11S). doi: 10.1016/j.jacr.2022.09.015. PMID: 36436964.



ADVANCED MULTIMODALITY IMAGE GUIDED OPERATING (AMIGO) SUITE

25. Ghodsi Z, Jazayeri SB, Pourrashidi A, Sadeghi-Naeini M, Azadmanjir Z, Baigi V, Maroufi SF, Azarhomayoun A, Faghih-Jouybari M, Amirjamshidi A, Naghdi K, Habibi Arejan R, Shabani M, Sepahdoost A, Dehghanbanadaki H, Habibi R, Mohammadzadeh M, Bahreini M, O'Reilly GM, Vaccaro AR, Harrop JS, Davies BM, Yi L, Ghodsi SM, Rahimi-Movaghar V. Development of a comprehensive assessment tool to measure the quality of care for individuals with traumatic spinal cord injuries. *Spinal Cord Ser Cases*. 2023 Apr 1;9(1):12. doi: 10.1038/s41394-023-00569-3. Erratum in: *Spinal Cord Ser Cases*. 2023 Sep 6;9(1):47. PMID: 37005413; PMCID: PMC10067818.
26. Jha R, Bernstock JD, Chalif JI, Hoffman SE, Gupta S, Guo H, Lu Y. Updates on Pathophysiology of Discogenic Back Pain. *J Clin Med*. 2023 Nov 2;12(21):6907. doi: 10.3390/jcm12216907. PMID: 37959372; PMCID: PMC10647359.
27. Fehlings MG, Tetreault LA, Hachem L, Evaniew N, Ganau M, McKenna SL, Neal CJ, Nagoshi N, Rahimi-Movaghar V, Aarabi B, Hofstetter CP, Wengel VT, Nakashima H, Martin AR, Kirshblum S, Rodrigues Pinto R, Marco RAW, Wilson JR, Kahn DE, Newcombe VFJ, Zipser CM, Douglas S, Kurpad SN, Lu Y, Saigal R, Samadani U, Arnold PM, Hawryluk GWJ, Skelly AC, Kwon BK. An Update of a Clinical Practice Guideline for the Management of Patients With Acute Spinal Cord Injury: Recommendations on the Role and Timing of Decompressive Surgery. *Global Spine J*. 2024 Mar;14(3_suppl):174S-186S. doi: 10.1177/21925682231181883. PMID: 38526922; PMCID: PMC10964895.
28. Lu T, Sun Z, Xia H, Qing J, Rashad A, Lu Y, He X. Comparing the osteogenesis outcomes of different lumbar interbody fusions (A/O/X/T/PLIF) by evaluating their mechano-driven fusion processes. *Comput Biol Med*. 2024 Mar;171:108215. doi: 10.1016/j.compbiomed.2024.108215. Epub 2024 Feb 27. PMID: 38422963.
29. Jha R, Chalif JI, Lu Y. Evaluating the Need for Durotomy and Duraplasty in Adults Undergoing Suboccipital Craniectomy for Chiari Decompression: A Case Series Analysis of Radiographic and Clinical Outcomes. *Cureus*. 2024 May 20;16(5). doi: 10.7759/cureus.60694. PMID: 38899249; PMCID: PMC11186607.
30. Joshua D, Bernstock, Jakob V. E, Gerstl, Jason A, Chen, Benjamin R, Johnston, Leo F, Nonnenbroich, Pablo A, Valdes, Yi Lu, John D, Rolston, G, Rees Cosgrove, E, Antonio Chiocca. The case for neurosurgical intervention in cancer neuroscience. Accepted. *Journal of Neurosurgery*.
31. Yusuf Mehkri, Cathleen Kuo, Julian Gendreau, Eli Johnson,

- Christine Park, Melissa Erickson, Khoi Than, C. Rory Goodwin, Yi Lu, Muhammad M. Abd-El-Barr. Comparison of Intraoperative and Postoperative Outcomes Between Open vs Wiltse vs Percutaneous Approach to Instrumentation of Traumatic Spine Fractures. Accepted at NASSJ.
32. Rohan Jha SB, Joshua I. Chalif MD PhD, Sarah E. Blitz BS, Alexander G. Yearley BA, Velina Chavarro MD, Yi Lu. Expandable cages lead to improved clinical and radiographic outcomes in transforaminal lumbar interbody fusion: a propensity matched cohort analysis. *JNS Spine*. Accepted.
33. Chalif JI, Chavarro VS, Mensah E, Johnston B, Fields DP, Chalif EJ, Chiang M, Sutton O, Yong R, Trumbower R, Lu Y. Epidural Spinal Cord Stimulation for Spinal Cord Injury in Humans: A Systematic Review. *J Clin Med*. 2024 Feb 14;13(4):1090. doi: 10.3390/jcm13041090. PMID: 38398403.
34. Prevalence, risk factors, natural history, and prognostic significance of Modic changes in the cervical spine: a comprehensive systematic review and meta-analysis of 12,754 participants. *Neurosurgical Review*. Accepted.
35. Aging Brain-to-Vision Nexus: Molecular Insights, Neuroimaging Advances and Therapeutic Perspectives. Umar Raza; Shun Yao; Shaolei Guo; Yuxing Su; Ruchit Patel; Yaqiong Xiao; Yong-Gao Mou; Yi Lu. Submitted to *Neuroscience and Biobehavioral Reviews*.
36. Pure Titanium and Titanium Polyetheretherketone Cages versus Polyetheretherketone for Transforaminal Lumbar Interbody Fusion: A Systematic Review and Meta-Analysis. Submitted.
37. Transcranial Direct Current Stimulation in Postoperative Pain Following Spine Surgery: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Submitted to *JCS spine*.
38. Gabapentinoids confer benefit in TSP-1 positive human glioblastoma. Submitted to *Nature Medicine*.
39. Perioperative Nefopam Improves Pain Management After Spine Surgery: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Submitted to *Global Spine Journal*.
40. 3D Technologies for Retinal Disease Modeling and Regeneration. Submitted to *Bioengineering and Translational Medicine*.
41. American College of Radiology ACR Appropriateness Criteria® Suspected Primary Bone Tumors.



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PUBLICATIONS

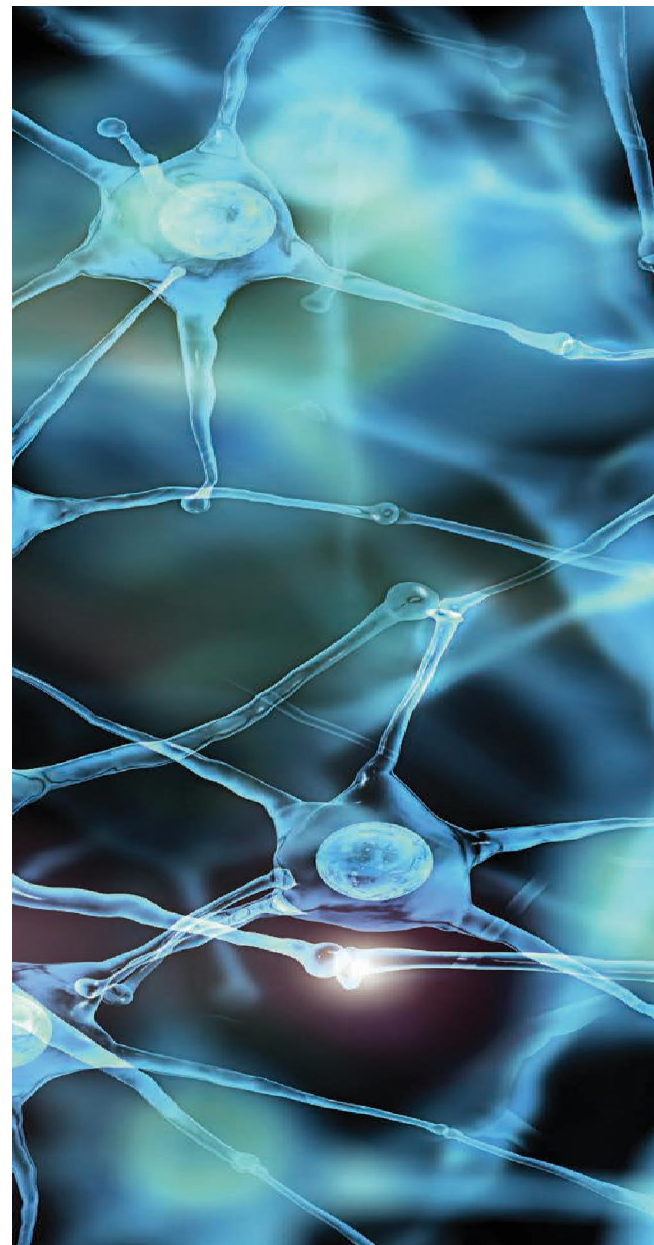
1. Little AS, Chicoine MR, Kelly DF, Sarris CE, Mooney MA, White WL, Gardner PA, Fernandez-Miranda JC, Barkhoudarian G, Chandler JP, Prevedello DM, Liebelt BD, Sfondouris J, Mayberg MR; TRANSSPHER Study Group. Evaluation of Surgical Resection Goal and Its Relationship to Extent of Resection and Patient Outcomes in a Multicenter Prospective Study of Patients With Surgically Treated, Nonfunctioning Pituitary Adenomas: A Case Series. *Oper Neurosurg (Hagerstown)*. 2020 Jan 1;18(1):26-33. doi: 10.1093/ons/opz085. PMID: 31079156.
2. Mooney MA, Bi WL, Cantalino JM, Wu KC, Harris TC, Possatti LL, Juvekar P, Hsu L, Dunn IF, Al-Mefty O, Devlin PM. Brachytherapy with surgical resection as salvage treatment for recurrent high-grade meningiomas: a matched cohort study. *J Neurooncol*. 2020 Jan;146(1):111-120. doi: 10.1007/s11060-019-03342-5. Epub 2019 Nov 19. PMID: 31745706.
3. Xie G, Zhang F, Leung L, Mooney MA, Epprecht L, Norton I, Rathi Y, Kikinis R, Al-Mefty O, Makris N, Golby AJ, O'Donnell LJ. Anatomical assessment of trigeminal nerve tractography using diffusion MRI: A comparison of acquisition b-values and single- and multi-fiber tracking strategies. *Neuroimage Clin*. 2020;25:102160. doi: 10.1016/j.nicl.2019.102160. Epub 2020 Jan 8. PMID: 31954337; PMCID: PMC6962690.
4. Mooney MA, Ryabinin P, Wilmot B, Bhatt P, Mill J, Nigg JT. Large epigenome-wide association study of childhood ADHD identifies peripheral DNA methylation associated with disease and polygenic risk burden. *Transl Psychiatry*. 2020 Jan 21;10(1):8. doi: 10.1038/s41398-020-0710-4. PMID: 32066674; PMCID: PMC7026179.
5. Mooney MA, Cavallo C, Zhou JJ, Bohl MA, Belykh E, Gandhi S, McBryan S, Stevens SM, Lawton MT, Almefty KK, Nakaji P. Three-Dimensional Printed Models for Lateral Skull Base Surgical Training: Anatomy and Simulation of the Transtemporal Approaches. *Oper Neurosurg (Hagerstown)*. 2020 Feb 1;18(2):193-201. doi: 10.1093/ons/opz120. PMID: 31172189.
6. Mooney MA, Almefty KK. Endoscope-Assisted, Transmastoid, High Cervical Approach for Resection of a Jugular Foramen Schwannoma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2020 Feb 1;18(2). doi: 10.1093/ons/opz149. PMID: 31214698.

7. Nigg JT, Karalunas SL, Gustafsson HC, Bhatt P, Ryabinin P, Mooney MA, Faraone SV, Fair DA, Wilmot B. Evaluating chronic emotional dysregulation and irritability in relation to ADHD and depression genetic risk in children with ADHD. *J Child Psychol Psychiatry*. 2020 Feb;61(2):205-214. doi: 10.1111/jcpp.13132. Epub 2019 Oct 12. PMID: 31605387; PMCID: PMC6980250.
8. Catapano JS, Mezher AW, Wang DJ, Whiting AC, Mooney MA, Bohl MA, Sheehy JP, DiDomenico JD, Sarris CE, Smith KA, Lawton MT, Zabramski JM. Laparoscopic-Assisted Ventriculoperitoneal Shunt Placement and Reduction in Operative Time and Total Hospital Charges. *World Neurosurg*. 2020 Mar;135. doi: 10.1016/j.wneu.2019.12.086. Epub 2019 Dec 24. PMID: 31874294.
9. Herosillo RJM, Mooney MA, Fezcko E, Earl E, Marr M, Sturgeon D, Perrone A, Dominguez OM, Faraone SV, Wilmot B, Nigg JT, Fair DA. Polygenic Risk Score-Derived Subcortical Connectivity Mediates Attention-Deficit/Hyperactivity Disorder Diagnosis. *Biol Psychiatry Cogn Neurosci Neuroimaging*. 2020 Mar;5(3):330-341. doi: 10.1016/j.bpsc.2019.11.014. Epub 2019 Dec 13. PMID: 32033925; PMCID: PMC7147985.
10. Graham JB, Swarts JL, Menachery VD, Gralinski LE, Schäfer A, Plante KS, Morrison CR, Voss KM, Green R, Choonoo G, Jeng S, Miller DR, Mooney MA, McWeeney SK, Ferris MT, Pardo-Manuel de Villena F, Gale M, Heise MT, Baric RS, Lund JM. Immune Predictors of Mortality After Ribonucleic Acid Virus Infection. *J Infect Dis*. 2020 Mar 2;221(6):882-889. doi: 10.1093/infdis/jiz531. PMID: 31621854; PMCID: PMC7107456.
11. Nisson PL, Fard SA, Walter CM, Johnstone CM, Mooney MA, Tayebi Meybodi A, Lang M, Kim H, Jahnke H, Roe DJ, Dumont TM, Lemole GM, Spetzler RF, Lawton MT. A novel proposed grading system for cerebellar arteriovenous malformations. *J Neurosurg*. 2019 Mar 8;132(4):1105-1115. doi: 10.3171/2018.12.JNS181677. PMID: 30849761; PMCID: PMC6856412.
12. Barber SR, Jain S, Mooney MA, Almefty KK, Lawton MT, Son YJ, Stevens SM. Combining Stereoscopic Video and Virtual Reality Simulation to Maximize Education in Lateral Skull Base Surgery. *Otolaryngol Head Neck Surg*. 2020 Jun;162(6):922-925. doi: 10.1177/0194599820907866. Epub 2020 Mar 17. PMID: 32180502.
13. Catapano JS, Mezher AW, Wang DJ, Whiting AC, Mooney MA, Bohl MA, Sheehy JP, DiDomenico JD, Sarris CE, Smith KA, Lawton MT, Zabramski JM. In Reply to the Letter to the Editor Regarding "Laparoscopic-Assisted Ventriculoperitoneal Shunt Placement and Reduction in Operative Time and Total Hospital Charges". *World Neurosurg*. 2020 Aug;140:442. doi: 10.1016/j.wneu.2020.06.054. PMID: 32797965.
14. Labib MA, Gandhi S, Cavallo C, Nisson PL, Mooney MA, Catapano JS, Lang MJ, Chen T, Lawton MT. Anterior Cerebral Artery Bypass for Complex Aneurysms: Advances in Intracranial-Intracranial Bypass Techniques. *World Neurosurg*. 2020 Sep;141. doi: 10.1016/j.wneu.2020.04.124. Epub 2020 Apr 28. PMID: 32360674.
15. Graham JB, Swarts JL, Leist SR, Schäfer A, Menachery VD, Gralinski LE, Jeng S, Miller DR, Mooney MA, McWeeney SK, Ferris MT, de Villena FP, Heise MT, Baric RS, Lund JM. Baseline T cell immune phenotypes predict virologic and disease control upon SARS-CoV infection. *bioRxiv [Preprint]*. 2020 Sep 21:2020.09.21.306837. doi: 10.1101/2020.09.21.306837. Update in: *PLoS Pathog*. 2021 Jan 29;17(1). doi: 10.1371/journal.ppat.1009287. PMID: 32995791; PMCID: PMC7523117.
16. Belykh E, Ngo B, Farhadi DS, Zhao X, Mooney MA, White WL, Daniels JK, Little AS, Eschbacher JM, Preul MC. Confocal Laser Endomicroscopy Assessment of Pituitary Tumor Microstructure: A Feasibility Study. *J Clin Med*. 2020 Sep 29;9(10):3146. doi: 10.3390/jcm9103146. PMID: 33003336; PMCID: PMC7600847.
17. Mooney MA, Abolfotoh M, Bi WL, Tavanaiepour D, Almefty RO, Bassiouni H, Pravdenkova S, Dunn IF, Al-Mefty O. Is Falcine Meningioma a Diffuse Disease of the Falx? Case Series and Analysis of a "Grade Zero" Resection. *Neurosurgery*. 2020 Oct 15;87(5):900-909. doi: 10.1093/neuros/nyaa038. PMID: 32294205.
18. Zhang F, Xie G, Leung L, Mooney MA, Epprecht L, Norton I, Rathi Y, Kikinis R, Al-Mefty O, Makris N, Golby AJ, O'Donnell LJ. Creation of a novel trigeminal tractography atlas for automated trigeminal nerve identification. *Neuroimage*. 2020 Oct 15;220:117063. doi: 10.1016/j.neuroimage.2020.117063. Epub 2020 Jun 20. PMID: 32574805; PMCID: PMC7572753.
19. Graham JB, Swarts JL, Leist SR, Schäfer A, Menachery VD, Gralinski LE, Jeng S, Miller DR, Mooney MA, McWeeney SK, Ferris MT, Pardo-Manuel de Villena F, Heise MT, Baric RS, Lund JM. Baseline T cell immune phenotypes predict virologic and disease control upon SARS-CoV infection in Collaborative Cross mice. *PLoS Pathog*. 2021 Jan 29;17(1). doi: 10.1371/journal.ppat.1009287. PMID: 33513210; PMCID: PMC7875398.
20. Wang Q, Xie X, Yu H, Mooney MA. Predicting Slurry Pressure Balance with a Long Short-Term Memory Recurrent Neural Network in Difficult Ground Condition. *Comput Intell Neurosci*. 2021 Feb 20;2021:6678355. doi: 10.1155/2021/6678355. PMID: 33708249; PMCID: PMC7930917.
21. Graham JB, Swarts JL, Edwards KR, Voss KM, Green R, Jeng S, Miller DR, Mooney MA, McWeeney SK, Ferris MT, Pardo-Manuel de Villena F, Gale M Jr, Lund JM. Correlation of Regulatory T Cell Numbers with Disease Tolerance upon Virus Infection. *Immunohorizons*. 2021 Apr 23;5(4):157-169. doi: 10.4049/immunohorizons.2100009. PMID: 33893179; PMCID: PMC8281504.
22. Essayed WIBN, Mooney MA, Al-Mefty O. Venous Anatomy Influence on the Approach Selection of a Petroclival Clear Cell Meningioma With Associated Multiple Spinal Meningiomas: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 May 13;20(6). doi: 10.1093/ons/opab072. PMID: 33928378.
23. Essayed W, Mooney MA, Al-Mefty O. Transcavernous Resection of an Upper Clival Chondrosarcoma: "Cavernous Sinus as a Route": 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 May 13;20(6). doi: 10.1093/ons/opab043. PMID: 33940624.
24. Schäfer A, Gralinski LE, Leist SR, Winkler ES, Hampton BK, Mooney MA, Jensen KL, Graham RL, Agnihothram S, Jeng S, Chamberlin S, Bell TA, Scobey DT, VanBlargan LA, Thackray LB, Hock P, Miller DR, Shaw GD, de Villena FPM, McWeeney SK, Montgomery SA, Diamond MS, Heise MT, Menachery VD, Ferris MT, Baric RS. Common Mechanism of SARS-CoV and SARS-CoV-2 Pathogenesis across Species. *bioRxiv [Preprint]*. 2021 May 14:2021.05.14.444205. doi: 10.1101/2021.05.14.444205. PMID: 34013261; PMCID: PMC8132217.
25. Harman G, Kliamovich D, Morales AM, Gilbert S, Barch DM, Mooney MA, Feldstein Ewing SW, Fair DA, Nagel BJ. Prediction of suicidal ideation and attempt in 9 and 10 year-old children using transdiagnostic risk features. *PLoS One*. 2021 May 25;16(5). doi: 10.1371/journal.pone.0252114. PMID: 34033672; PMCID: PMC8148349.
26. Mooney MA, Bhatt P, Herosillo RJM, Ryabinin P, Nikolas M, Faraone SV, Fair DA, Wilmot B, Nigg JT. Smaller total brain volume but not subcortical structure volume related to common genetic risk for ADHD. *Psychol Med*. 2021 Jun;51(8):1279-1288. doi: 10.1017/S0033291719004148. Epub 2020 Jan 24. PMID: 31973781; PMCID: PMC7461955.
27. Almefty RO, Xu DS, Mooney MA, Montoure A, Naeem K, Coons SW, Spetzler RF, Porter RW. Comparison of Surgical Outcomes and Recurrence Rates of Cystic and Solid Vestibular Schwannomas. *J Neurol Surg B Skull Base*. 2021 Jun;82(3):333-337. doi: 10.1055/s-0039-1697039. Epub 2019 Oct 21. PMID: 34026409; PMCID: PMC8133812.
28. Mauler DJ, Mooney MA, Sheehy JP, Kakarla UK, Bohl MA. Hospital use following anterior cervical discectomy and fusion. *J Clin Neurosci*. 2021 Jul;89:128-132. doi: 10.1016/j.jocn.2021.03.008. Epub 2021 May 11. PMID: 34119255.
29. Frisoli FA, Catapano JS, Farber SH, Baranoski JF, Singh R, Benet A, Cole TS, Mooney MA, Lawton MT. Thrombectomy and Clip Occlusion of a Giant, Stent-Coiled Basilar Bifurcation Aneurysm: 3-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jul 15;21(2). doi: 10.1093/ons/opab108. Erratum in: *Oper Neurosurg (Hagerstown)*. 2021 Sep 15;21(4):276. doi: 10.1093/ons/opab279. PMID: 33929027.
30. Mooney MA, Ibn Essayed W, Aziz-Sultan MA, Al-Mefty O. Concomitant Embolization and Microsurgical Resection of a Giant, Hypervascular Skull Base Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jul 15;21(2). doi: 10.1093/ons/opab128. PMID: 33930164.
31. Mooney MA, Ibn Essayed W, Al-Mefty O. Simpson Grade I Removal of Tuberculoma Sella Meningioma Through the Supraorbital Approach: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Jul 15;21(2). doi: 10.1093/ons/opab133. PMID: 33989424.
32. Hardesty DA, Mooney MA, Hendricks BK, Catapano JS, Brigeman ST, Bohl MA, Sheehy JP, Little AS. Postoperative 30-day emergency department utilization after 7294 cranial neurosurgery procedures at a tertiary neuroscience center. *J Neurosurg*. 2021 Jan 29;135(3):934-942. doi: 10.3171/2020.8.JNS202404. PMID: 33513573.
33. Mooney MA, Ibn Essayed W, Al-Mefty O. Nuances of Olfactory Groove Meningioma Surgery: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Sep 15;21(4). doi: 10.1093/ons/opab233. PMID: 34195839.
34. Srinivasan VM, Catapano JS, Frisoli FA, Mooney MA, Lawton MT. Microsurgical Management of a Marginal Sinus Dural Arteriovenous Fistula: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2021 Oct 13;21(5). doi: 10.1093/ons/opab287. PMID: 34423838.

35. Hoffman C, Siddiqui NY, Fields I, Gregory WT, Simon HM, Mooney MA, Wolfe AJ, Karstens L. Species-Level Resolution of Female Bladder Microbiota from 16S rRNA Amplicon Sequencing. *mSystems*. 2021 Oct 26;6(5). doi: 10.1128/mSystems.00518-21. Epub 2021 Sep 14. PMID: 34519534; PMCID: PMC8547459.
36. Belykh E, Giovani A, Abramov I, Ngo B, Bardanova L, Zhao X, Loymak T, Mooney MA, Sheehy JP, McBryan S, Tanikawa R, Lawton MT, Preul MC. Novel System of Simulation Models for Aneurysm Clipping Training: Description of Models and Assessment of Face, Content, and Construct Validity. *Oper Neurosurg (Hagerstown)*. 2021 Nov 15;21(6):558-569. doi: 10.1093/ons/opab357. PMID: 34662910.
37. Mooney MA, Al-Mefty O. Syringomyelia From Extramedullary Compression: Resolution After Microsurgical Resection of a High-Cervical Spine Schwannoma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2022 Jan 1;22(1). doi: 10.1227/ONS.0000000000000003. PMID: 34982911.
38. Mooney MA, Al-Mefty O. Sugita-Kobayashi Maneuver for Preservation of Large Bridging Veins in the Interhemispheric Approach: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2022 Jan 1;22(1). doi: 10.1227/ONS.0000000000000022. PMID: 34982916.
39. Tam EK, Laver NV, Thakore-James M, Mooney MA, Daly MK, Lefebvre DR. ARHGEF-10 gene mutation presenting as orbital inflammatory syndrome. *BMJ Case Rep*. 2022 Mar 8;15(3). doi: 10.1136/bcr-2021-245475. PMID: 35260397; PMCID: PMC8905991.
40. Mooney MA, Aboud E, Essayed W, Al-Mefty O. "Grade Zero" Removal of a Falcine Meningioma: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2022 Apr 1;22(4). doi: 10.1227/ONS.0000000000000093. PMID: 35156944.
41. Wu KC, Cantalino JM, Dee EC, Hsu L, Harris TC, Rawal B, Juvekar PR, Mooney MA, Dunn IF, Aizer AA, Devlin PM, Bi WL. Salvage brachytherapy for multiply recurrent metastatic brain tumors: A matched case analysis. *Neurooncol Adv*. 2022 Apr 22;4(1). doi: 10.1093/oaajnl/vdac039. PMID: 35571989; PMCID: PMC9092639.
42. Mooney MA, Essayed W, Patel V, Devlin PM, Al-Mefty O. Brachytherapy as Salvage Treatment for Meningioma With Malignant Progression After Exhausting Other Treatment Options: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*. 2022 May 1;22(5). doi: 10.1227/ons.000000000000129. PMID: 35426879.
43. Yearley AG, Iorgulescu JB, Chiocca EA, Peruzzi PP, Smith TR, Reardon DA, Mooney MA. The current state of glioma data registries. *Neurooncol Adv*. 2022 Jun 24;4(1). doi: 10.1093/oaajnl/vdac099. PMID: 36196363; PMCID: PMC9521197.
44. Martel MM, Elkins AR, Eng AG, Goh PK, Bansal PS, Smith-Thomas TE, Thaxton MH, Ryabinin P, Mooney MA, Gustafsson HC, Karalunas SL, Nigg JT. Longitudinal Temperament Pathways to ADHD Between Childhood and Adolescence. *Res Child Adolesc Psychopathol*. 2022 Aug;50(8):1055-1066. doi: 10.1007/s10802-022-00902-8. Epub 2022 Feb 1. PMID: 35102487; PMCID: PMC9680910.
45. Cordova MM, Antovich DM, Ryabinin P, Neighbor C, Mooney MA, Dieckmann NF, Miranda-Dominguez O, Nagel BJ, Fair DA, Nigg JT. Attention-Deficit/Hyperactivity Disorder: Restricted Phenotypes Prevalence, Comorbidity, and Polygenic Risk Sensitivity in the ABCD Baseline Cohort. *J Am Acad Child Adolesc Psychiatry*. 2022 Oct;61(10):1273-1284. doi: 10.1016/j.jaac.2022.03.030. Epub 2022 Apr 12. PMID: 35427730; PMCID: PMC9677584.
46. Yearley AG, Ng PR, Gupta S, Cosgrove GR, Mooney MA. Utility of a Pilot Neurosurgical Operative Skills Boot Camp in Medical Student Training. *World Neurosurg*. 2022 Oct;166. doi: 10.1016/j.wneu.2022.07.065. Epub 2022 Jul 20. PMID: 35870784.
47. Ng PR, Yearley AG, Mooney MA. In Reply to the Letter to the Editor Regarding "Utility of a Pilot Neurosurgical Operative Skills Boot Camp in Medical Student Training". *World Neurosurg*. 2022 Nov;167:251. doi: 10.1016/j.wneu.2022.09.054. PMID: 36793176.
48. Almefty KK, Mooney MA, Al-Mefty O, Essayed W, Bi WL, Cai L, Kadri PAS. Intracranial Facial Schwannomas: Multiple Distinct Entities Necessitating Tailored Management. *World Neurosurg*. 2022 Dec;168. doi: 10.1016/j.wneu.2022.09.082. Epub 2022 Sep 20. PMID: 36150600.
49. Abo KM, Kane J, Druckenbrod RC, Mooney MA, Rachlin J. Intraoperative hypovolemia as a possible precipitating factor for pituitary apoplexy: a case report. *J Med Case Rep*. 2023 Feb 10;17(1):53. doi: 10.1186/s13256-022-03738-4. PMID: 36759850; PMCID: PMC9912690.
50. Nigg JT, Karalunas SL, Mooney MA, Wilmot B, Nikolas MA, Martel MM, Tipsord J, Nousen EK, Schmitt C, Ryabinin P, Musser ED, Nagel BJ, Fair DA. The Oregon ADHD-1000: A new longitudinal data resource enriched for clinical cases and multiple levels of analysis. *Dev Cogn Neurosci*. 2023 Apr;60:101222. doi: 10.1016/j.dcn.2023.101222. Epub 2023 Feb 24. PMID: 36848718; PMCID: PMC9984785.
51. Byington N, Grimsrud G, Mooney MA, Cordova M, Doyle O, Hermsillo RJM, Earl E, Houghton A, Conan G, Hendrickson TJ, Ragothaman A, Carrasco CM, Rueter A, Perrone A, Moore LA, Graham A, Nigg JT, Thompson WK, Nelson SM, Feczko E, Fair DA, Miranda-Dominguez O. Polyneuro risk scores capture widely distributed connectivity patterns of cognition. *Dev Cogn Neurosci*. 2023 Apr;60:101231. doi: 10.1016/j.dcn.2023.101231. Epub 2023 Mar 15. PMID: 36934605; PMCID: PMC10031023.
52. de la Paz L, Mooney MA, Ryabinin P, Neighbor C, Antovich D, Nigg JT, Nikolas MA. Youth Polygenic Scores, Youth ADHD Symptoms, and Parenting Dimensions: An Evocative Gene-Environment Correlation Study. *Res Child Adolesc Psychopathol*. 2023 May;51(5):665-677. doi: 10.1007/s10802-023-01024-5. Epub 2023 Jan 16. PMID: 36645612; PMCID: PMC10560546.
53. Dash GF, Karalunas SL, Kenyon EA, Carter EK, Mooney MA, Nigg JT, Feldstein Ewing SW. Gene-by-Environment Interaction Effects of Social Adversity on Externalizing Behavior in ABCD Youth. *Behav Genet*. 2023 May;53(3):219-231. doi: 10.1007/s10519-023-10136-z. Epub 2023 Feb 16. PMID: 36795263; PMCID: PMC9933005.
54. Mooney MA, Neighbor C, Karalunas S, Dieckmann NF, Nikolas M, Nousen E, Tipsord J, Song X, Nigg JT. Prediction of Attention-Deficit/Hyperactivity Disorder Diagnosis Using Brief, Low-Cost Clinical Measures: A Competitive Model Evaluation. *Clin Psychol Sci*. 2023 May;11(3):458-475. doi: 10.1177/21677026221120236. Epub 2022 Dec 22. PMID: 37205171; PMCID: PMC10191260.
55. Yearley AG, Patel RV, Rachlin JR, Gupta S, King JT Jr, Cosgrove GR, Mooney MA. Integration of Veterans Affairs Medical Centers Into Neurosurgical Residency Programs. *Neurosurgery*. 2023 Jun 1;92(6). doi: 10.1227/neu.0000000000002362. Epub 2023 Jan 16. PMID: 36728276.
56. Yearley AG, Patel RV, Mooney MA. In Reply: Integration of Veterans Affairs Medical Centers into Neurosurgical Residency Programs. *Neurosurgery*. 2023 Jun 1;92(6). doi: 10.1227/neu.0000000000002471. Epub 2023 Mar 30. PMID: 36995089.
57. Mooney MA, Ryabinin P, Morton H, Selah K, Gonoud R, Kozlowski M, Nousen E, Tipsord J, Antovich D, Schwartz J, Herting MM, Faraone SV, Nigg JT. Joint polygenic and environmental risks for childhood attention-deficit/hyperactivity disorder (ADHD) and ADHD symptom dimensions. *JCPP Adv*. 2023 Mar 16;3(2). doi: 10.1002/jcv2.12152. PMID: 37753156; PMCID: PMC10519744.
58. Yoon JS, Ng PR, Hoffman SE, Gupta S, Mooney MA. Price Transparency for Cervical Spinal Fusion Among High-Performing Spine Centers in the United States. *Neurosurgery*. 2023 Nov 20. doi: 10.1227/neu.0000000000002770. Epub ahead of print. PMID: 37982614.
59. Vaz N, Dietsche E, Mooney MA, Choudhury AD, Jacene HA. Late Subacute Cerebral Hematoma Mimicking a Metastasis on PSMA PET/CT. *Clin Nucl Med*. 2024 Feb 1;49(2). doi: 10.1097/RLU.00000000000005011. Epub 2023 Dec 16. PMID: 38108822.
60. Bihn JR, Cioffi G, Waite KA, Kruchko C, Neff C, Price M, Ostrom QT, Swinnerton KN, Elbers DC, Mooney MA, Rachlin J, Stein TD, Brophy MT, Do NV, Ferguson RE, Priemer DS, Perl DP, Hickman RA, Nabors B, Rusiecki J, Barnholtz-Sloan JS, Fillmore NR. Brain tumors in United States military veterans. *Neuro Oncol*. 2024 Feb 2;26(2):387-396. doi: 10.1093/neuonc/noad182. PMID: 37738677; PMCID: PMC10836768.
61. Chen JA, Mooney MA, Rachlin JR. Landmine Injury Resulting in Comminuted Lumbar Facet Fracture as a Cause of Lumbar Stenosis and Spondylolisthesis. *Mil Med*. 2024 Feb 27;189(3-4). doi: 10.1093/milmed/usad358. PMID: 37675860.
62. Mooney MA, Hermsillo RJM, Feczko E, Miranda-Dominguez O, Moore LA, Perrone A, Byington N, Grimsrud G, Rueter A, Nousen E, Antovich D, Feldstein Ewing SW, Nagel BJ, Nigg JT, Fair DA. Cumulative Effects of Resting-State Connectivity Across All Brain Networks Significantly Correlate with Attention-Deficit Hyperactivity Disorder Symptoms. *J Neurosci*. 2024 Mar 6;44(10)
63. Tobochnik S, Regan MS, Dorotan MKC, Reich D, Lapinskas E, Hossain MA, Stopka S, Santagata S, Murphy MM, Arnaout O, Bi WL, Antonio Chiocca E, Golby AJ, Mooney MA, Smith TR, Ligon KL, Wen PY, Agar NYR, Lee JW. Pilot trial of perampanel on peritumoral hyperexcitability and clinical outcomes in newly diagnosed high-grade glioma. medRxiv [Preprint]. 2024 Apr 18:2024.04.11.24305666. doi: 10.1101/2024.04.11.24305666. PMID: 38645003; PMCID: PMC11030478.

64. Hermsillo RJM, Moore LA, Feczko E, Miranda-Domínguez Ó, Pines A, Dworetzky A, Conan G, Mooney MA, Randolph A, Graham A, Adeyemo B, Earl E, Perrone A, Carrasco CM, Uriarte-Lopez J, Snider K, Doyle O, Cordova M, Koirala S, Grimsrud GJ, Byington N, Nelson SM, Gratton C, Petersen S, Feldstein Ewing SW, Nagel BJ, Dosenbach NUF, Satterthwaite TD, Fair DA. A precision functional atlas of personalized network topography and probabilities. *Nat Neurosci*. 2024 May;27(5):1000-1013. doi: 10.1038/s41593-024-01596-5. Epub 2024 Mar 26. PMID: 38532024; PMCID: PMC11089006.
65. Schäfer A, Gralinski LE, Leist SR, Hampton BK, Mooney MA, Jensen KL, Graham RL, Agnihothram S, Jeng S, Chamberlin S, Bell TA, Scobey DT, Linnertz CL, VanBlargan LA, Thackray LB, Hock P, Miller DR, Shaw GD, Diamond MS, de Villena FPM, McWeeney SK, Heise MT, Menachery VD, Ferris MT, Baric RS. Genetic loci regulate Sarbecovirus pathogenesis: A comparison across mice and humans. *Virus Res*. 2024 Jun;344:199357. doi: 10.1016/j.virusres.2024.199357. Epub 2024 Mar 23. PMID: 38508400; PMCID: PMC10981091.
66. Gerstl JVE, Gupta S, Stenberg CE, Chabros J, Nonnenbroich LF, Lindberg R, Altshuler MS, Seaver D, Mooney MA, Frerichs KU, Smith TR, Arnaout O. From Operating Room to Courtroom: Analyzing Malpractice Trajectories in Cranial Neurosurgery. *Neurosurgery*. 2024 Jun 25. doi: 10.1227/neu.0000000000003052. Epub ahead of print. PMID: 38916340.
67. Schuurmans IK, Mulder RH, Baltramonaityte V, Lahtinen A, Qiuyu F, Rothmann LM, Staginns M, Tuulari J, Burt SA, Buss C, Craig JM, Donald KA, Felix JF, Freeman TP, Grassi-Oliveira R, Huels A, Hyde LW, Jones SA, Karlsson H, Karlsson L, Koen N, Lawn W, Mitchell C, Monk CS, Mooney MA, Muetzel R, Nigg JT, Belangero SIN, Notterman D, O'Connor T, O'Donnell KJ, Pan PM, Paunio T, Ryabinin P, Saffery R, Salum GA, Seal M, Silk TJ, Stein DJ, Zar H, Walton E, Cecil CAM. Consortium Profile: The Methylation, Imaging and NeuroDevelopment (MIND) Consortium. *medRxiv* [Preprint]. 2024 Jun 25:2024.06.23.24309353. doi: 10.1101/2024.06.23.24309353. PMID: 38978656; PMCID: PMC11230303.
68. Yearley AG, Altshuler M, Patel RV, Rachlin JR, Mooney MA. Neurosurgical Residency Training at Veterans Affairs Medical Centers, the Resident Perspective. *Oper Neurosurg (Hagerstown)*. 2024 Sep 27. doi: 10.1227/ons.0000000000001390. Epub ahead of print. PMID: 39329497.

69. Koirala S, Grimsrud G, Mooney MA, Larsen B, Feczko E, Elison JT, Nelson SM, Nigg JT, Tervo-Clemmens B, Fair DA. Neurobiology of attention-deficit hyperactivity disorder: historical challenges and emerging frontiers. *Nat Rev Neurosci*. 2024 Oct 24. doi: 10.1038/s41583-024-00869-z. Epub ahead of print. PMID: 39448818.
70. Tobochnik S, Regan MS, Dorotan MKC, Reich D, Lapinskas E, Hossain MA, Stopka S, Meredith DM, Santagata S, Murphy MM, Arnaout O, Bi WL, Chiocca EA, Golby AJ, Mooney MA, Smith TR, Ligon KL, Wen PY, Agar NYR, Lee JW. Pilot Trial of Perampanel on Peritumoral Hyperexcitability in Newly Diagnosed High-grade Glioma. *Clin Cancer Res*. 2024 Nov 5. doi: 10.1158/1078-0432.CCR-24-1849. Epub ahead of print. PMID: 39499201.



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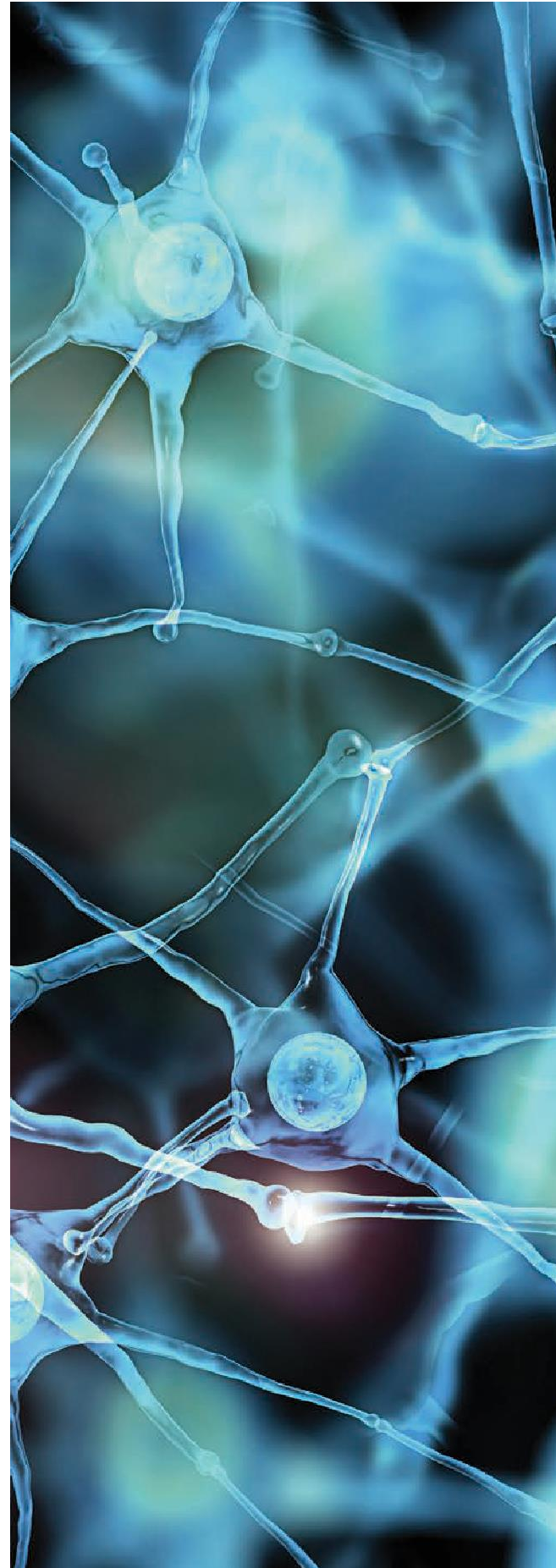
Acoustic neuroma, aneurysms, arteriovenous malformations, astrocytoma, brain tumors, bypass, carotid artery disease, cavernous malformations, cerebral revascularization, endovascular neurosurgery, meningiomas, Moyamoya disease, radiosurgery, skull base neurosurgery, trigeminal neuralgia

PUBLICATIONS

- Patel NJ, Hogan KJ, Rizk E, Stewart K, Madrid A, Meethal SV, Alisch R, Borth L, Papale LA, Ondoma S, Gorges LR, Weber K, Lake W, Bauer A, Hariharan N, Kuehn T, Cook T, Keles S, Newton MA, Iskandar BJ. Ancestral Folate Promotes Neuronal Regeneration in Serial Generations of Progeny. *Molecular Neurobiology*. October 2019. <https://doi.org/10.1007/s12035-019-01812-5>.
- Hormuzdiyar H, Dasenbrock, Timothy R Smith, William B Gormley, Joseph P Castlen, Nirav J Patel, Kai U Frerichs, M Ali Aziz-Sultan, Rose Du. Predictive Score of Adverse Events After Carotid Endarterectomy: The NSQIP Registry Carotid Endarterectomy Scale. November 2019. PMID: 31662028 PMCID: PMC6898838 DOI: 10.1161/JAHA.119.013412.
- Cerecedo-Lopez CD, Cantu-Aldana A, Patel NJ, Aziz-Sultan MA, Frerichs KU, Du R. Insulin in the Management of Acute Ischemic Stroke: A Systematic Review and Meta-Analysis. *World Neurosurgery*. January 2020.
- Cikla U, Rowley P, Jennings Simoes EL, Ozaydin B, Goodman SL, Avic E, Baskaya MK, Patel NJ. Grapefruit Training Model for Distal Anterior Cerebral Artery Side-to-Side Bypass. *World Neurosurgery*. June 2020.
- Michael A Silva, Pui Man Rosalind Lai, Rose Du, Mohammad A Aziz-Sultan, Nirav J Patel. The Ruptured Arteriovenous Malformation Grading Scale (RAGS): An Extension of the Hunt and Hess Scale to Predict Clinical Outcome for Patients With Ruptured Brain Arteriovenous Malformations. August 2020. DOI: 10.1093/neuros/nyz404. PMID: 31586199.
- Melissa Ming Jie Chua, Alvin S Das, Julie Aurore Losman, Nirav J Patel, Saef Izzy. Spontaneous hemorrhage after external ventricular drain placement in the setting of low factor VII secondary to liver cirrhosis. November 2020. PMID: 33365166 PMCID: PMC7749959 DOI: 10.25259/SNI_446_2020.
- Asad Mehmood Lak, MD, Christian D Cerecedo Lopez, MD, Julia Cha, Timothy R Smith, MD, PhD, MPH, Mohammad A Aziz-Sultan, MD, William Gormley, Rose Du, MD, PhD, Nirav J Patel, MD, MA. Interventional Management of Epileptic Seizures Associated with Arteriovenous Malformations: A Systematic Review and Meta-Analysis. 16 November 2020.
- Das A, Regenhardt R, Patel NJ, Feske SK, Bevers MB, Vaitkevicius H, Saef I. Diffuse Cerebral Edema After Moyamoya Disease-Related Intracerebral Hemorrhage: A Case Report. *The Neurohospitalist*. December 2020.

9. Lai PRM, Ng I, Gormley WB, Patel Nirav J, Frerichs KU, Aziz-Sultan MA, Du R. Familial Predisposition and Differences in Radiographic Patterns in Spontaneous Nonaneurysmal Subarachnoid Hemorrhage. *Neurosurgery*. 2021 Jan 13; PMID 33017030.
10. Bernier TD, Schontz MJ, Izzy S, Chung DY, Nelson SE, Leslie-Mazwi TM, Henderson GV, Dasenbrock H, Patel Nirav J, Aziz-Sultan MA, Feske S, Du R, Abulhasan YB, Angle, MR. Treatment of Subarachnoid Hemorrhage-associated Delayed Cerebral Ischemia with Milrinone: A Review and Proposal. *J Neurosurg Anesthesiol*. 2021 Jan 20; PMID 33480639.
11. Wu KC, Sunwoo J, Sheriff F, Farzam P, Farzam PY, Orihuela-Espina F, Larose S, Monk A, Aziz-Sultan MA, Patel Nirav J, Vaitkevicius H, Franceschini MA. Validation of diffuse correlation spectroscopy measures of critical closing pressure against transcranial Doppler ultrasound in stroke patients. *Journal of Biomedical Optics*. 2021 March 26; PMID 33774980.
12. Pui Man Rosalind Lai, MD, Nirav J Patel, MD, Kai U Frerichs, MD, Aman B Patel, MD, M Ali Aziz-Sultan, MD, Christopher S Ogilvy, MD, Rose Du, MD, PhD. Direct vs Indirect Revascularization in a North American Cohort of Moyamoya Disease. May 2021. PMID 33957674.
13. Bernier, Thomas D. PharmD, MBA; Schontz, Michael J. PharmD; Izzy, Saef MD, Chung, David Y. MD, PhD, Nelson, Sarah E. MD, Leslie-Mazwi, Thabele M. MD, Henderson, Galen V. MD, Dasenbrock, Hormuzdiyar MD, Patel, Nirav MD, Aziz-Sultan, Mohammad A. MD, Feske, Steven MD, Du, Rose MD, PhD, Abulhasan, Yasser B., Angle, Mark R. MD. Treatment of Subarachnoid Hemorrhage-associated Delayed Cerebral Ischemia With Milrinone: A Review and Proposal, *Journal of Neurosurgical Anesthesiology*: July 2021 - Volume 33 - Issue 3 - p 195-202 doi: 10.1097/ANA.0000000000000755.
14. Lai PMR, Caragher S, Patel NJ, Du R, Ali Aziz-Sultan M. Safety Profile and Factors Associated with Good Outcome for Endovascularly Treated Infectious Intracranial Aneurysms. *Neurosurgery*. 2022 Feb 1;90(2):233-239. doi: 10.1227/NEU.0000000000001785. PMID: 34995237.
15. Gupta S, Vicenty-Padilla J, Lai PMR, Zhou X, Bernstock JD, Chua M, Izzy S, Aziz-Sultan MA, Du R, Patel NJ. Posterior Cerebral Artery Aneurysm Re-Rupture Following Revascularization for Moyamoya Disease. *J Stroke Cerebrovascular*. 2021 Sept 14; PMID: 34534774.
16. Pui Man Rosalind Lai, Isaac Ng, William B. Gormley, Nirav J Patel, Kai U. Frerichs, M. Ali Aziz-Sultan, Rose Du. Cannabis Use and Increased Nonaneurysmal Subarachnoid Hemorrhage in the Past Decade: *World Neurosurgery*. Volume 154, Pages e580-e589. October 2021.
17. Christian D. Cerecedo-Lopez, Issac Ng, Hillary B. Nguyen, Pui Man Rosalind Lai, William B. Gormley, Nirav Patel, Kai U. Frerichs, M. Ali Aziz-Sultan & Rose Du. Incidence and Outcomes of Registry-Based Acute Myocardial Infarction After Aneurysmal Subarachnoid Hemorrhage. *Neurocrit Care*. October 2021. <https://doi.org/10.1007/s12028-021-01365-3>.
18. Kappel AD, Bernstock JD, Patel NJ. Cerebral Hyperperfusion After Double Barrel Superficial Temporal Artery-Middle Cerebral Artery Bypass. *Stroke*. 2022 May 3 doi: 10.1161/STROKEAHA.122.039227. Epub ahead of print. PMID: 35502661.
19. Lak AM, Cerecedo-Lopez CD, Cha J, Aziz-Sultan MA, Frerichs KU, Gormley WB, Mekary RA, Du R, Patel NJ. Seizure Outcomes After Interventional Treatment in Cerebral Arteriovenous Malformation-Associated Epilepsy: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2022 April 16; PMID 35364673.
20. "Recycling" a Failed Superficial Temporal Artery Indirect Bypass into a Double Barrel Direct Bypass in Moyamoya Disease. *Journal of Stroke and Cerebrovascular Diseases*. (May 2022).
21. Lai PMR, Gomez-Paz S, Patel NJ, Frerichs KU, Thomas AJ, Aziz-Sultan, MA, Patel AB, Ogilvy CS, Du R. Asymptomatic Moyamoya Disease in a North American Adult Cohort. *World Neurosurg*. 2022 Jan 29; PMID 35092810.
22. Jason A Chen, Shervin Mirshahi, Yasser Jeelani, Joshua D Bernstock, Christopher Stapleton, Nirav J Patel. Delayed Rupture of an Anterior Communicating Artery Aneurysm After Elective Woven Endobridge Embolization, Re-Treated With Microsurgical Clipping: Operative Technique and Systematic Review. PMID: 35697227.
23. Lai PMR, Ryu JY, Park SC, Gross BA, Dickinson LD, Dagen S, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Blackburn S, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Frerichs KU, Niemela M, Ojemann SG, Patel NJ, Shi X, Valle-Giler EP, Wang AC, Welch BG, Zusman EE, Weiss ST, Du R. Somatic Variants in SVIL in Cerebral Aneurysms. *Neurol Genet*. 2022 Nov 28. PMID: 36475054.
24. Gerstl JVE, Blitz SE, Qu QR, Yearley AG, Lassarén P, Lindberg R, Gupta S, Kappel AD, Vicenty-Padilla JC, Gaude E, Atchaneeyasakul KC, Desai SM, Yavagal DR, Peruzzotti-Jametti L, Patel NJ, Aziz-Sultan MA, Du R, Smith TR, Bernstock JD. Global, Regional, and National Economic Consequences of Stroke. *Stroke*. 2023 Sep;54(9):2380-2389. doi: 10.1161/STROKEAHA.123.043131. Epub 2023 Jul 27. PMID: 37497672; PMCID: PMC7614992.
25. Chen JA, Kappel AD, Torio EF, Bass DI, Feroze A, Patel NJ. Combination endovascular and microsurgical treatment of partially thrombosed ruptured ICA terminus aneurysm, with common carotid artery to MCA bypass via saphenous vein graft and parent vessel sacrifice after coil embolization. *J Clin Neurosci*. 2024 Jan;119:62-63. doi: 10.1016/j.jocn.2023.11.011. Epub 2023 Nov 18. PMID: 37984189.
26. Kappel AD, Chen JA, Chalif JI, Bass DI, Torio EF, Feroze AH, Patel NJ. Craniocervical dural arteriovenous fistula: Microsurgical clipping and technical nuances with ICG. *J Clin Neurosci*. 2024 Jan;119:64-65. doi: 10.1016/j.jocn.2023.11.017. Epub 2023 Nov 18. PMID: 37984190.
27. Kappel AD, Chen JA, Torio EF, Gal ZT, Bass DI, Feroze A, Vaca SD, Kuzli J, Patel NJ. Brain AVM surgery without endovascular embolization in a low to middle income country. *J Clin Neurosci*. 2024 Jan;119:68-69. doi: 10.1016/j.jocn.2023.11.009. Epub 2023 Nov 20. PMID: 37988974.
28. Kappel AD, Nguyen HB, Frerichs KU, Patel NJ, Aziz-Sultan MA, Du R. Randomized Clinical Trials in Cerebrovascular Neurosurgery From 2018 to 2022. *Cureus*. 2024 Jan 16;16(1). doi: 10.7759/cureus.52397. PMID: 38361699; PMCID: PMC10869144.
29. Kawano Y, Wang X, Patel NJ, Qian G, Kowalski E, Bade KJ, Vanni KMM, Jonsson AH, Williams ZK, Cook CE, Srivatsan S, Wallace ZS, Sparks JA. Breakthrough COVID-19 After Tixagevimab/Cilgavimab Among Patients With Systemic Autoimmune Rheumatic Diseases. *J Rheumatol*. 2024 Mar 1;51(3):305-312. doi: 10.3899/jrheum.2023-0742. PMID: 37839812; PMCID: PMC10925916.
30. Schiff AE, Wang X, Patel NJ, Kawano Y, Hanberg JL, Kowalski EN, Cook CE, Vanni KM, Qian G, Bade KJ, Saavedra AA, Srivatsan S, Williams ZK, Venkat RK, Wallace ZS, Sparks JA. Immunomodulators and risk for breakthrough COVID-19 after third SARS-CoV-2 mRNA vaccine among patients with rheumatoid arthritis: a cohort study. *Ann Rheum Dis*. 2024 Apr 11;83(5):680-682. doi: 10.1136/ard-2023-225162. PMID: 38199795; PMCID: PMC11009046.
31. Pradilla G, Ratcliff JJ, Hall AJ, Saville BR, Allen JW, Paulon G, McGlothlin A, Lewis RJ, Fitzgerald M, Caveney AF, Li XT, Bain M, Gomes J, Jankowitz B, Zenonos G, Molyneaux BJ, Davies J, Siddiqui A, Chicoine MR, Keyrouz SG, Grossberg JA, Shah MV, Singh R, Bohnstedt BN, Frankel M, Wright DW, Barrow DL; ENRICH trial investigators; ENRICH Trial Investigators. Trial of Early Minimally Invasive Removal of Intracerebral Hemorrhage. *N Engl J Med*. 2024 Apr 11;390(14):1277-1289. doi: 10.1056/NEJMoa2308440. PMID: 38598795.
32. Kappel AD, Jha R, Guggilapu S, Smith WJ, Feroze AH, Dmytriw AA, Vicenty-Padilla J, Alcedo Guardia RE, Gessler FA, Patel NJ, Du R, See AP, Peruzzi PP, Aziz-Sultan MA, Bernstock JD. Endovascular Applications for the Management of High-Grade Gliomas in the Modern Era. *Cancers (Basel)*. 2024 Apr 22;16(8):1594. doi: 10.3390/cancers16081594. PMID: 38672676; PMCID: PMC11049132.
33. Patel NJ, Wang X, Lin M, Kowalski EN, Cook CE, Vanni KMM, Guzzo K, Qian G, Bade KJ, Saavedra A, Venkat R, Srivatsan S, Williams ZK, Hanberg JS, Kawano Y, Schiff AE, Sparks JA, Wallace ZS. Factors Associated With an Electronic Health Record-Based Definition of Postacute Sequelae of COVID-19 in Patients With Systemic Autoimmune Rheumatic Disease. *J Rheumatol*. 2024 May 1;51(5):529-537. doi: 10.3899/jrheum.2023-1092. PMID: 38428964; PMCID: PMC11065568.
34. Walton ZE, Patel NJ. Improvement of a giant cell arteritis prediction model. *Lancet Rheumatol*. 2024 May;6(5). doi: 10.1016/S2665-9913(24)00083-3. Epub 2024 Mar 27. PMID: 38554719.
35. Patel NJ, Thippani S, Jathan J, Gaur G, Sawant JY, Pandya JM, Sapi E. Evidence for the presence of *Borrelia burgdorferi* in invasive breast cancer tissues. *Eur J Microbiol Immunol (Bp)*. 2024 Mar 7;14(2):143-153. doi: 10.1556/1886.2024.00021. PMID: 38451280; PMCID: PMC11097788.
36. El Naamani K, Mastorakos P, Adeeb N, Lan M, Castiglione J, Khanna O, Diestro JDB, McLellan RM, Dibas M, Vranic JE, Aslan A, Cuellar-Saenz HH, Guenego A, Carnevale J, Saliou G, Ulfert C, Möhlenbruch M, Foreman PM, Vachhani JA, Hafeez MU, Waqas M, Tutino VM, Rabinov JD, Ren Y, Michelozzi C, Spears J, Panni P, Griessenauer CJ, Asadi H, Regenhardt RW, Stapleton CJ, Ghozy S, Siddiqui A, Patel NJ, Kan P, Boddu S, Knopman J, Aziz-Sultan MA, Zanaty M, Ghosh R, Abbas R, Amlay A, Tjoumakaris SI, Gooch MR, Cancelliere NM, Herial NA, Rosenwasser RH, Zarzour H, Schmidt RF, Pereira VM, Patel AB, Jabbour P, Dmytriw AA; WorldWideWEB Consortium. Long-Term Follow-Up of Cerebral Aneurysms Completely Occluded at 6 Months After Intervention with the Woven EndoBridge (WEB) Device: a Retrospective Multicenter Observational Study. *Transl Stroke Res*. 2024 Jun;15(3):591-598. doi: 10.1007/s12975-023-01153-5. Epub 2023 May 11. PMID: 37165289.

37. El Naamani K, Mastorakos P, Adeeb N, Lan M, Castiglione J, Khanna O, Diestro JDB, McLellan RM, Dibas M, Vranic JE, Aslan A, Cuellar-Saenz HH, Guenego A, Carnevale J, Saliou G, Ulfert C, Möhlenbruch M, Foreman PM, Vachhani JA, Hafeez MU, Waqas M, Tutino VM, Rabinov JD, Ren Y, Michelozzi C, Spears J, Panni P, Griessenauer CJ, Asadi H, Regenhardt RW, Stapleton CJ, Ghozy S, Siddiqui A, Patel NJ, Kan P, Boddu S, Knopman J, Aziz-Sultan MA, Zanaty M, Ghosh R, Abbas R, Amlly A, Tjounakaris SI, Gooch MR, Cancelliere NM, Herial NA, Rosenwasser RH, Zarzour H, Schmidt RF, Pereira VM, Patel AB, Jabbour P, Dmytriw AA; WorldWideWEB Consortium. Long-Term Follow-Up of Cerebral Aneurysms Completely Occluded at 6 Months After Intervention with the Woven EndoBridge (WEB) Device: a Retrospective Multicenter Observational Study. *Transl Stroke Res.* 2024 Jun;15(3):591-598. doi: 10.1007/s12975-023-01153-5. Epub 2023 May 11. PMID: 37165289.
38. Chen KS, Khawaja A, Xu E, Mekary RA, Vaitkevicius H, Aziz-Sultan A, Du R, Patel NJ. Changes in inpatient brain arteriovenous malformation management in the United States following the ARUBA trial: analysis of an interrupted time series design. *Clin Neurol Neurosurg.* 2024 Jul;242:108293. doi: 10.1016/j.clineuro.2024.108293. Epub 2024 May 6. PMID: 38728853.
39. Lai PMR, Beazer M, Frerichs KU, Patel NJ, Aziz-Sultan MA, Du R. Association Between Moyamoya Revascularization Surgery and Neurologic Events During Pregnancy: Systematic Review. *Neurosurgery.* 2024 Oct 2. doi: 10.1227/neu.0000000000003184. Epub ahead of print. PMID: 39356157.
40. Jha R, Kappel AD, Feroze AH, Essayed W, Patel NJ. Bilateral STA-MCA bypass for Moyamoya angiopathy associated with severe erythrodermic psoriasis. *J Stroke Cerebrovasc Dis.* 2024 Nov;33(11):107997. doi: 10.1016/j.jstrokecerebrovasdis.2024.107997. Epub 2024 Sep 5. PMID: 39243833.
41. Zhang J, Ryu JY, Tirado SR, Dickinson LD, Abosch A, Aziz-Sultan MA, Boulos AS, Barrow DL, Batjer HH, Binyamin TR, Blackburn SL, Chang EF, Chen PR, Colby GP, Cosgrove GR, David CA, Day AL, Folkerth RD, Frerichs KU, Howard BM, Jahromi BR, Niemela M, Ojemann SG, Patel NJ, Richardson RM, Shi X, Valle-Giler EP, Wang AC, Welch BG, Williams Z, Zusman EE, Weiss ST, Du R; GENIE Investigators. A Transcriptomic Comparative Study of Cranial Vasculature. *Transl Stroke Res.* 2024 Dec;15(6):1108-1122. doi: 10.1007/s12975-023-01186-w. Epub 2023 Aug 23. PMID: 37612482.



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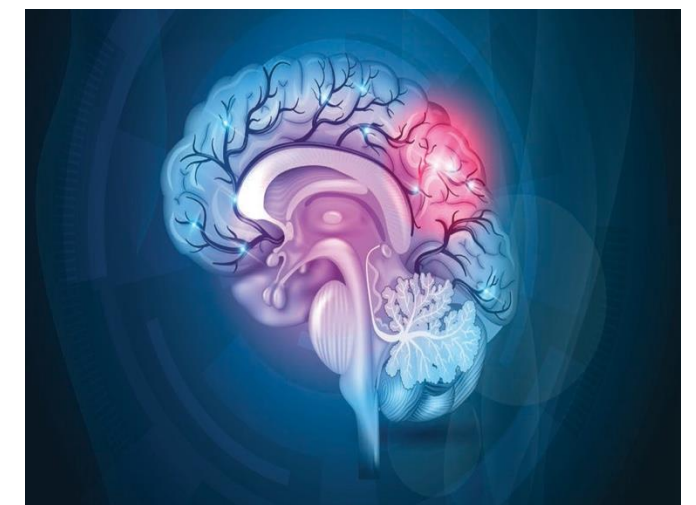
CLINICAL INTERESTS

Awake Surgery for Speech and Motor Monitoring, Brain Metastases, Brain tumors, Chiari malformation, endoscopic neurosurgery, gliomas, meningiomas, peripheral nerve disease, skull base neurosurgery, spinal cord tumors, spinal disorders

PUBLICATIONS

1. Stienen MN, Freyschlag CF, Schaller K, Meling T; EANS Young Neurosurgeons and EANS Training Committee. Procedures performed during neurosurgery residency in Europe. *Acta Neurochir (Wien).* 2020 Oct;162(10):2303-2311. doi: 10.1007/s00701-020-04513-4. Epub 2020 Aug 16. PMID: 32803372; PMCID: PMC7496021.
2. Bronisz A, Rooj AK, Krawczyński K, Peruzzi P, Salińska E, Nakano I, Purow B, Chiocca EA, Godlewski J. The nuclear DICER-circular RNA complex drives the deregulation of the glioblastoma cell microRNAome. *Sci Adv.* 2020 Dec 16;6(51). doi: 10.1126/sciadv.abc0221. PMID: 33328224; PMCID: PMC7744081.
3. Rigoard P, Billot M, Ingrand P, Durand-Zaleski I, Roulaud M, Peruzzi P, Dam Hieu P, Voirin J, Raoul S, Page P, Djian MC, Fontaine D, Lantéri-Minet M, Blond S, Buisset N, Cuny E, Cadenne M, Caire F, Ranoux D, Mertens P, Naous H, Simon E, Emery E, Béraud G, Debais F, Durand G, Serrie A, Diallo B, Bulsei J, Ounajim A, Nivole K, Durantou S, Naiditch N, Monlezun O, Bataille B. How Should we Use Multicolumn Spinal Cord Stimulation to Optimize Back Pain Spatial Neural Targeting? A Prospective, Multicenter, Randomized, Double-Blind, Controlled Trial (ESTIMET Study). *Neuromodulation.* 2021 Jan;24(1):86-101. doi: 10.1111/ner.13251. Epub 2020 Aug 31. PMID: 32865344.
4. Olsen HE, Lynn GM, Valdes PA, Cerecedo Lopez CD, Ishizuka AS, Arnaout O, Bi WL, Peruzzi PP, Chiocca EA, Friedman GK, Bernstock JD. Therapeutic cancer vaccines for pediatric malignancies: advances, challenges, and emerging technologies. *Neurooncol Adv.* 2021 Feb 11;3(1). doi: 10.1093/noajnl/vdab027. PMID: 33860227; PMCID: PMC8034661.
5. Amelot A, Nataloni A, François P, Cook AR, Lejeune JP, Baroncini M, Hénaux PL, Toussaint P, Peltier J, Buffenoir K, Hamel O, Hieu PD, Chibbaro S, Kehrl P, Lahlou MA, Menei P, Lonjon M, Mottolese C, Peruzzi P, Mahla K, Scarvada D, Le Guerinel C, Caillaud P, Nuti C, Pommier B, Faillot T, Iakovlev G, Goutagny S, Lonjon N, Cornu P, Bousquet P, Sabatier P, Debono B, Lescure JP, Vicaut E, Froelich S. Security and reliability of CUSTOMBONE cranioplasties: A prospective multicentric study. *Neurochirurgie.* 2021 Jul;67(4):301-309. doi: 10.1016/j.neuchi.2021.02.007. Epub 2021 Mar 2. PMID: 33667533.

6. Blitz SE, Bernstock JD, Dmytriw AA, Ditoro DF, Kappel AD, Gormley WB, Peruzzi P. Ruptured Suprasellar Dermoid Cyst Treated With Lumbar Drain to Prevent Postoperative Hydrocephalus: Case Report and Focused Review of Literature. *Front Surg.* 2021 Aug 11;8:714771. doi: 10.3389/fsurg.2021.714771. PMID: 34458316; PMCID: PMC8385128.
7. Dominas C, Bhagavatula S, Stover E, Deans K, Larocca C, Colson Y, Peruzzi P, Kibel A, Hata N, Tsai L, Hung Y, Packard R, Jonas O. The Translational and Regulatory Development of an Implantable Microdevice for Multiple Drug Sensitivity Measurements in Cancer Patients. *IEEE Trans Biomed Eng.* 2022 Jan;69(1):412-421. doi: 10.1109/TBME.2021.3096126. Epub 2021 Dec 23. PMID: 34242160; PMCID: PMC8702455.
8. Peruzzi P, Valdes PQ, Aghi MK, Berger M, Chiocca EA, Golby AJ. The Evolving Role of Neurosurgical Intervention for Central Nervous System Tumors. *Hematol Oncol Clin North Am.* 2022 Feb;36(1):63-75. doi: 10.1016/j.hoc.2021.08.003. Epub 2021 Sep 23. PMID: 34565649.
9. Blitz SE, Kappel AD, Gessler FA, Klinger NV, Arnaout O, Lu Y, Peruzzi PP, Smith TR, Chiocca EA, Friedman GK, Bernstock JD. Tumor-Associated Macrophages/Microglia in Glioblastoma Oncolytic Virotherapy: A Double-Edged Sword. *Int J Mol Sci.* 2022 Feb 4;23(3):1808. doi: 10.3390/ijms23031808. PMID: 35163730; PMCID: PMC8836356.
10. Chiocca EA, Gelb AB, Chen CC, Rao G, Reardon DA, Wen PY, Bi WL, Peruzzi P, Amidei C, Triggs D, Seften L, Park G, Grant J, Truman K, Buck JY, Hadar N, Demars N, Miao J, Estupinan T, Loewy J, Chadha K, Tringali J, Cooper L, Lukas RV. Combined immunotherapy with controlled interleukin-12 gene therapy and immune checkpoint blockade in recurrent glioblastoma: An open-label, multi-institutional phase I trial. *Neuro Oncol.* 2022 Jun 1;24(6):951-963. doi: 10.1093/neuonc/noab271. PMID: 34850166; PMCID: PMC9159462.
11. Yearley AG, Iorgulescu JB, Chiocca EA, Peruzzi PP, Smith TR, Reardon DA, Mooney MA. The current state of glioma data registries. *Neurooncol Adv.* 2022 Jun 24;4(1). doi: 10.1093/noonl/vdac099. PMID: 36196363; PMCID: PMC9521197.
12. Lim-Fat MJ, Youssef GC, Touat M, Iorgulescu JB, Whorral S, Allen M, Rahman R, Chukwueke U, McFaline-Figueroa JR, Nayak L, Lee EQ, Batchelor TT, Arnaout O, Peruzzi PP, Chiocca EA, Reardon DA, Meredith D, Santagata S, Beroukhim R, Bi WL, Ligon KL, Wen PY. Clinical utility of targeted next-generation sequencing assay in IDH-wildtype glioblastoma for therapy decision-making. *Neuro Oncol.* 2022 Jul 1;24(7):1140-1149. doi: 10.1093/neuonc/noab282. PMID: 34878541; PMCID: PMC9248387.
13. Rigoard P, Ounajim A, Goudman L, Wood C, Roulaud M, Page P, Lorgeoux B, Baron S, Nivole K, Many M, Cuny E, Voirin J, Fontaine D, Raoul S, Mertens P, Peruzzi P, Caire F, Buisset N, David R, Moens M, Billot M. Combining Awake Anesthesia with Minimal Invasive Surgery Optimizes Intraoperative Surgical Spinal Cord Stimulation Lead Placement. *J Clin Med.* 2022 Sep 22;11(19):5575. doi: 10.3390/jcm11195575. PMID: 36233439; PMCID: PMC9571566.
14. Raghunath ALB, Chen JA, Valdes PA, Essayed W, Claus E, Arnaout O, Smith TR, Chiocca EA, Peruzzi PP, Bernstock JD. Cerebellar High-Grade Glioma: A Translationally Oriented Review of the Literature. *Cancers (Basel).* 2022 Dec 28;15(1):174. doi: 10.3390/cancers15010174. PMID: 36612169; PMCID: PMC9818238.
15. Laigle-Donadey F, Metellus P, Guyotat J, Menei P, Proust F, Dufour H, Chinot O, Honnorat J, Faillot T, Paquis P, Peruzzi P, Emery E, Guillamo JS, Carpentier A, Wager M, Lebbah S, Hajage D, Delattre JY, Cornu P. Surgery for glioblastomas in the elderly: an Association des Neuro-oncologues d'Expression Française (ANOCEF) trial. *J Neurosurg.* 2022 Oct 14;138(5):1199-1205. doi: 10.3171/2022.8.JNS221068. PMID: 36242578.
16. Peruzzi P, Dominas C, Fell G, Bernstock JD, Blitz S, Mazzetti D, Zdioruk M, Dawood HY, Triggs DV, Ahn SW, Bhagavatula SK, Davidson SM, Tatarova Z, Pannell M, Truman K, Ball A, Gold MP, Pister V, Fraenkel E, Chiocca EA, Ligon KL, Wen PY, Jonas O. Intratumoral drug-releasing microdevices allow in situ high-throughput pharmacophenotyping in patients with gliomas. *Sci Transl Med.* 2023 Sep 6;15(712). doi: 10.1126/scitranslmed.adi0069. Epub 2023 Sep 6. PMID: 37672566; PMCID: PMC10754230.
17. Karandikar PV, Suh L, Gerstl JVE, Blitz SE, Qu QR, Won SY, Gessler FA, Arnaout O, Smith TR, Peruzzi PP, Yang W, Friedman GK, Bernstock JD. Positioning SUMO as an immunological facilitator of oncolytic viruses for high-grade glioma. *Front Cell Dev Biol.* 2023 Oct 4;11:1271575. doi: 10.3389/fcell.2023.1271575. PMID: 37860820; PMCID: PMC10582965.
18. Ling AL, Solomon IH, Landivar AM, Nakashima H, Woods JK, Santos A, Masud N, Fell G, Mo X, Yilmaz AS, Grant J, Zhang A, Bernstock JD, Torio E, Ito H, Liu J, Shono N, Nowicki MO, Triggs D, Halloran P, Piranlioglu R, Soni H, Stopa B, Bi WL, Peruzzi P, Chen E, Malinowski SW, Prabhu MC, Zeng Y, Carlisle A, Rodig SJ, Wen PY, Lee EQ, Nayak L, Chukwueke U, Gonzalez Castro LN, Dumont SD, Batchelor T, Kittelberger K, Tikhonova E, Mihecheva N, Tabakov D, Shin N, Gorbacheva A, Shumskiy A, Frenkel F, Aguilar-Cordova E, Aguilar LK, Krisky D, Wechuck J, Manzanera A, Matheny C, Tak PP, Barone F, Kovarsky D, Tirosh I, Suvà ML, Wucherpennig KW, Ligon K, Reardon DA, Chiocca EA. Clinical trial links oncolytic immunoactivation to survival in glioblastoma. *Nature.* 2023 Nov;623(7985):157-166. doi: 10.1038/s41586-023-06623-2. Epub 2023 Oct 18. PMID: 37853118; PMCID: PMC10620094.
19. Bernstock JD, Chalif JI, Jha R, Brown A, Essayed WI, Caplan A, Peruzzi P. Treating the dead; how far ought medicine go to obtain transplantable organs? *Front Transplant.* 2023 Nov 17;2:1297957. doi: 10.3389/frtra.2023.1297957. PMID: 38993929; PMCID: PMC11235357.
20. Rahman R, Trippa L, Lee EQ, Arrillaga-Romany I, Fell G, Touat M, McCluskey C, Wiley J, Gaffey S, Drappatz J, Welch MR, Galanis E, Ahluwalia MS, Colman H, Nabors LB, Hepel J, Elinzano H, Schiff D, Chukwueke UN, Beroukhim R, Nayak L, McFaline-Figueroa JR, Batchelor TT, Rinne ML, Kaley TJ, Lu-Emerson C, Mellinghoff IK, Bi WL, Arnaout O, Peruzzi PP, Haas-Kogan D, Tanguturi S, Cagney D, Aizer A, Doherty L, Lavalley M, Fisher-Longden B, Dowling S, Geduldig J, Watkinson F, Pisano W, Malinowski S, Ramkissoon S, Santagata S, Meredith DM, Chiocca EA, Reardon DA, Alexander BM, Ligon KL, Wen PY. Inaugural Results of the Individualized Screening Trial of Innovative Glioblastoma Therapy: A Phase II Platform Trial for Newly Diagnosed Glioblastoma Using Bayesian Adaptive Randomization. *J Clin Oncol.* 2023 Dec 20;41(36):5524-5535. doi: 10.1200/JCO.23.00493. Epub 2023 Sep 18. PMID: 37722087.
21. Kappel AD, Jha R, Guggilapu S, Smith WJ, Feroze AH, Dmytriw AA, Vicenty-Padilla J, Alcedo Guardia RE, Gessler FA, Patel NJ, Du R, See AP, Peruzzi PP, Aziz-Sultan MA, Bernstock JD. Endovascular Applications for the Management of High-Grade Gliomas in the Modern Era. *Cancers (Basel).* 2024 Apr 22;16(8):1594. doi: 10.3390/cancers16081594. PMID: 38672676; PMCID: PMC11049132.
22. Depond CC, Zouaoui S, Darlix A, Rigau V, Mathieu-Daudé H, Bauchet F, Khettab M, Trétarre B, Figarella-Branger D, Taillandier L, Boetto J, Pallud J, Zemmoura I, Roche PH, Bauchet L; French Brain Tumour DataBase (FBTDB) Participants, Investigators with the participation of the Société française de neurochirurgie (SFNC); Club de neuro-oncologie de la société française de neurochirurgie, Société française de neuropathologie (SFNP); Association des neuro-oncologues d'expression française (ANOCEF). Descriptive epidemiology of 30,223 histopathologically confirmed meningiomas in France: 2006-2015. *Acta Neurochir (Wien).* 2024 May 14;166(1):214. doi: 10.1007/s00701-024-06093-z. PMID: 38740641.
23. Bernstock JD, Karandikar PV, Chen JA, Seidlitz J, Friedman GK, Meredith DM, Liu KX, Haas-Kogan D, Reardon DA, Peruzzi PP. Case Report: Low-grade glioma with NF1 loss of function mimicking diffuse intrinsic pontine glioma. *Front Surg.* 2024 May 22;11:1356660. doi: 10.3389/fsurg.2024.1356660. PMID: 38840975; PMCID: PMC11150652.
24. Chang C, Chavarro VS, Gerstl JVE, Blitz SE, Spanehl L, Dubinski D, Valdes PA, Tran LN, Gupta S, Esposito L, Mazzetti D, Gessler FA, Arnaout O, Smith TR, Friedman GK, Peruzzi P, Bernstock JD. Recurrent Glioblastoma-Molecular Underpinnings and Evolving Treatment Paradigms. *Int J Mol Sci.* 2024 Jun 19;25(12):6733. doi: 10.3390/ijms25126733. PMID: 38928445; PMCID: PMC11203521.
25. Bernstock JD, Gerstl JVE, Chen JA, Johnston BR, Nonnenbroich LF, Spanehl L, Gessler FA, Valdes PA, Lu Y, Srinivasan SS, Smith TR, Peruzzi P, Rolston JD, Stone S, Chiocca EA. The Case for Neurosurgical Intervention in Cancer Neuroscience. *Neurosurgery.* 2024 Jun 21. doi: 10.1227/neu.0000000000003039. Epub ahead of print. PMID: 38904388.
26. Champeaux Depond C, Zouaoui S, Darlix A, Rigau V, Mathieu-Daudé H, Bauchet F, Khettab M, Trétarre B, Figarella-Branger D, Taillandier L, Boetto J, Pallud J, Peyre M, Lottin M, Bauchet L; French Brain Tumour DataBase (FBTDB) Participants and Investigators with the participation of the Société française de neurochirurgie (SFNC), Club de neuro-oncologie de la société française de neurochirurgie, Société française de neuropathologie (SFNP), Association des neuro-oncologues d'expression française (ANOCEF). Descriptive epidemiology of 399 histologically confirmed newly diagnosed meningeal solitary fibrous tumours and haemangiopericytomas in France: 2006-2015. *Acta Neurochir (Wien).* 2024 Aug 2;166(1):320. doi: 10.1007/s00701-024-06191-y. PMID: 39093339.





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MEDICAL SCHOOL

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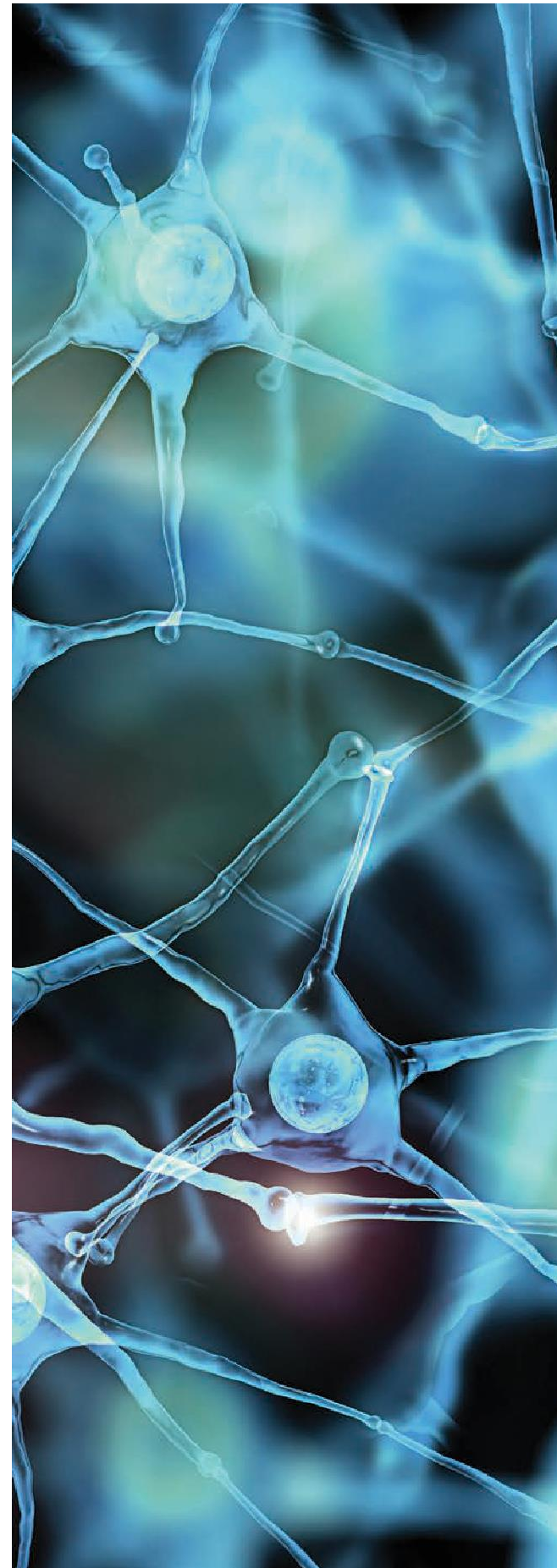
Tufts Medical Center 2014

BOARD CERTIFICATION

ABNS, Neurosurgery 2020

CLINICAL INTERESTS

Artificial Disc Replacement, Cervical Radiculopathy, Chiari Malformation, Degenerative Disc Disease, Endoscopic Neurosurgery, Image-Guided Surgery, Lumbar Radiculopathy, Neurological Oncology, Pituitary Tumors, Radiosurgery, Skull Base Neurosurgery, Spinal Disorders, Spinal Fusion, Spine Treatment, Cervical Stenosis, Lumbar Stenosis, Spinal Deformity, Spondylolisthesis



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BOARD CERTIFICATION

Neurological Surgery, 2020

CLINICAL INTERESTS

Deep Brain Stimulation, Dystonia, Epilepsy, Essential Tremor, Focused Ultrasound, Hemifacial Spasm, Laser Ablation, Microvascular, Decompression, Movement Disorder Surgery, Parkinson's Disease, Psychiatric Neurosurgery, Seizure Management, Trigeminal Neuralgia

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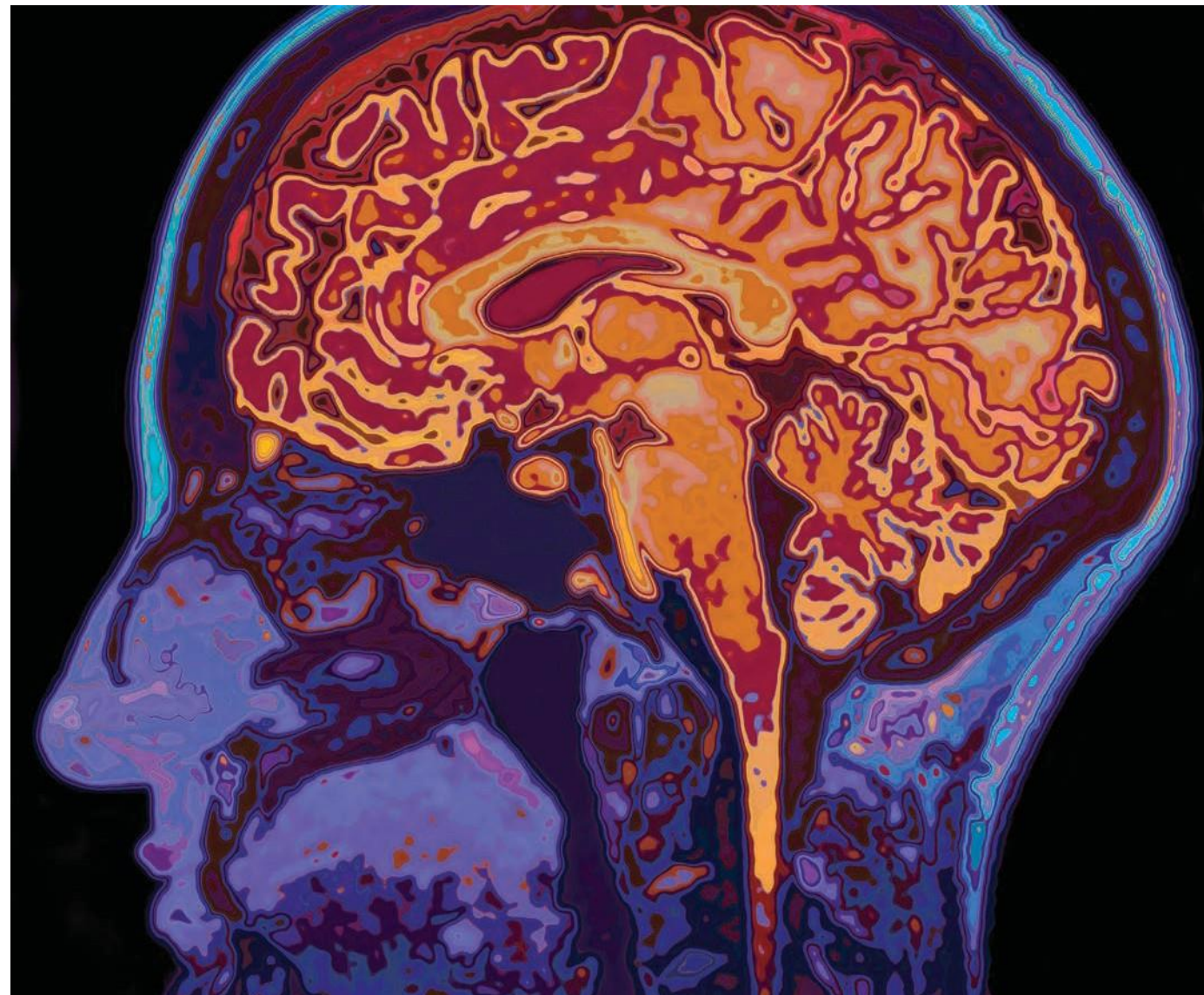
1. Kundu B, Davis TS, Philip B, Smith EH, Arain A, Peters A, Newman B, Butson CR, Rolston JD (2020). A systematic exploration of parameters affecting evoked intracranial potentials in patients with epilepsy. *Brain Stimul*, 13(5), 1232-1244.
2. Smith EH, Merricks EM, Liou JY, Casadei C, Melloni L, Thesen T, Friedman DJ, Doyle WK, Emerson RG, Goodman RR, McKhann GM 2nd, Sheth SA, Rolston JD, Schevon CA (2020). Dual mechanisms of ictal high frequency oscillations in human rhythmic onset seizures. *Sci Rep*, 10(1), 19166.
3. Narasimhan S, Kundassery KB, Gupta K, Johnson GW, Wills KE, Goodale SE, Haas K, Rolston JD, Naftel RP, Morgan VL, Dawant BM, González HFJ, Englot DJ (2020). Seizure-onset regions demonstrate high inward directed connectivity during resting-state: An SEEG study in focal epilepsy. *Epilepsia*, 61(11), 2534-2544.
4. Kim RB, Wilkerson C, Karsy M, Joyce E, Rolston JD, Couldwell WT, Mahan MA (2020). Prolonged Length of Stay and Risk of Unplanned 30-Day Readmission After Elective Spine Surgery: Propensity Score-Matched Analysis of 33,840 Patients. *Spine*, 45(18), 1260-1268.
5. Kundu B, Lucke-Wold B, Foster C, Englot DJ, Urhie O, Nwafor D, Rolston JD (2020). Fornicotomy for the Treatment of Epilepsy: An Examination of Historical Literature in the Setting of Modern Operative Techniques. *Neurosurgery*, 87(2), 157-165.
6. Holste K, Sahyouni R, Teton Z, Chan AY, Englot DJ, Rolston JD (2020). Spasm Freedom Following Microvascular Decompression for Hemifacial Spasm: Systematic Review and Meta-Analysis. *World Neurosurg*, 139, e383-e390.
7. Hale AT, Monsour MA, Rolston JD, Naftel RP, Englot DJ (2018). Deep brain stimulation in pediatric dystonia: a systematic review. *Neurosurg Rev*, 43(3), 873-880.
8. Goodale SE, González HFJ, Johnson GW, Gupta K, Rodriguez WJ, Shults R, Rogers BP, Rolston JD, Dawant BM, Morgan VL, Englot DJ (2020). Resting-State SEEG May Help Localize Epileptogenic Brain Regions. *Neurosurgery*, 86(6), 792-801.

9. Fernández E, Alfaro A, Soto-Sánchez C, González-López P, Lozano Ortega AM, Peña S, Grima MD, Rodil A, Gómez B, Chen X, Roelfsema PR, Rolston JD, Davis TS, Normann RA (2021). Visual percepts evoked with an Intracortical 96-channel microelectrode array inserted in human occipital cortex. *J Clin Invest*, 131(23).
10. Jehi L, Morita-Sherman M, Love TE, Bartolomei F, Bingaman W, Braun K, Busch RM, Duncan J, Hader WJ, Luan G, Rolston JD, Schuele S, Tassi L, Vadera S, Sheikh S, Najm I, Arain A, Bingaman J, Diehl B, de Tisi J, Rados M, Van Eijsden P, Wahby S, Wang X, Wiebe S (2021). Comparative Effectiveness of Stereotactic Electroencephalography Versus Subdural Grids in Epilepsy Surgery. *Ann Neurol*, 90(6):927-939.
11. Davis TS, Caston RM, Charlebois CM, Philip B, Anderson DN, Weaver KE, Smith EH, Rolston JD (2021). LeGUI: A fast and accurate graphical user interface for automated detection and anatomical localization of intracranial electrodes. *Frontiers in Neuroscience*, 15:769872.
12. Anderson DN, Charlebois CM, Smith EH, Arain AM, Davis TS, Rolston JD (2021). Probabilistic comparison of gray and white matter coverage between depth and surface intracranial electrodes in epilepsy. *Scientific Reports*, 11(1):24155.
13. Edlow BL, Sanz LRD, Polizzotto L, Pouratian N, Rolston JD, Snider SB, Thibaut A, Stevens RD, Gosseries O, Curing Coma Campaign and its contributing members (2021). Therapies to Restore Consciousness in Patients with Severe Brain Injuries: A Gap Analysis and Future Directions. *Neurocrit Care*, 35(Suppl 1), 68-85.
14. Scoville JP, Joyce E, Hunsaker J, Reese J, Wilde H, Arain A, Bollo RL, Rolston JD (2021). Stereotactic Electroencephalography Is Associated With Reduced Pain and Opioid Use When Compared with Subdural Grids: A Case Series. *Oper Neurosurg (Hagerstown)*, 21(1), 6-13.
15. Anderson DN, Dorval AD, Rolston JD, Pulst SM, Anderson CJ (2021). Computational investigation of the impact of deep brain stimulation contact size and shape on neural selectivity. *J Neural Eng*, 18(5):10.1088/1741-2552/abeeeaa.
16. Brock AA, Kundu B, Rolston JD (2021). Asleep Deep Brain Stimulator Placement in the Intraoperative Magnetic Resonance Imaging System Hybrid Operating Suite: 2-Dimensional Operative Video. *Oper Neurosurg (Hagerstown)*, 20(3), E217-E218.
17. Charlebois CM, Anderson DN, Johnson KA, Philip BJ, Davis TS, Newman BJ, Peters AY, Arain AM, Dorval AD, Rolston JD, Butson CR (2022). Patient-specific structural connectivity informs outcomes of responsive neurostimulation for temporal lobe epilepsy. *Epilepsia*, 63(8):2037-2055.
18. Campbell JM, Kundu B, Lee JN, Miranda M, Arain A, Taussky P, Grandhi R, Rolston JD (2022). Evaluating the concordance of functional MRI-based language lateralization and Wada testing in epilepsy patients: A single-center analysis. *Interventional Neuroradiology*, 15910199221121384.
19. Kundu B, Brock AA, Garry JG, Jensen RL, Burt LM, Cannon DM, Shrieve DC, Rolston JD (2022). Outcomes using linear accelerator stereotactic radiosurgery for the treatment of trigeminal neuralgia: A single-center, retrospective study. *Surgical Neurology International*, 13:246.
20. Hunsaker JC, Scoville JP, Joyce E, Harper J, Kurudza E, Sweney M, Bollo RJ, Rolston JD (2022). Stereotactic electroencephalography is associated with reduced opioid and nonsteroidal anti-inflammatory drug use when compared with subdural grids a pediatric case series. *Journal of Clinical Neuroscience*, 101:180-185.
21. Sherrod BA, Wilkerson CG, Rolston JD, Bisson EF, Mazur MD, Couldwell WT, Dailey AT (2022). Neurosurgery at Pearl Harbor: Ralph Cloward's legacy. *Neurosurgical Focus*, 53(3)
22. Touma L, Dansereau B, Chan AY, Jette N, Kwon CS, Braun KPJ, Friedman D, Jehi L, Rolston JD, Vadera S, Wong-Kisiel LC, Englot DJ, Keezer MR (2022). Neurostimulation in People with Drug-Resistant Epilepsy: Systematic Review and Meta-Analysis from the ILAE Surgical Therapies Commission. *Epilepsia*, 63(6):1314-1329.
23. Paulo DL, Wills KE, Johnson GW, Gonzalez HFJ, Rolston JD, Naftel RP, Reddy SB, Morgan VL, Kang H, Williams Roberson S, Narasimhan S, Englot DJ (2022). SEEG Functional Connectivity Measures to Identify Epileptogenic Zones: Stability, Medication Influence, and Recording Condition. *Neurology*, 98(20)
24. Smith EH, Liou JY, Merricks EM, Davis TS, Thomson K, Greger B, House PA, Emerson RG, Goodman RR, McKhann GM, Sheth SA, Schevon CA, Rolston JD (2022). Human interictal epileptiform discharges are bidirectional traveling waves echoing ictal discharges. *eLife*, 11
25. Campbell JM, Ballard J, Duff K, Zorn M, Moretti P, Alexander MD, Rolston JD (2022). Balance and cognitive impairments are prevalent and correlated with age in presurgical patients with essential tremor. *Clinical Parkinsonism & Related Disorders*, 6:100134.
26. Joshi RS, Pereira MP, Osorio RC, Oh T, Haddad AF, Pereira KM, Donohue KC, Peeran Z, Sudhir S, Jain S, Beniwal A, Chandra A, Han SJ, Rolston JD, Theodosopoulos PV, Kunwar S, Blevins LS, Aghi MK (2022). Identifying risk factors for postoperative diabetes insipidus in over 2,500 patients undergoing transsphenoidal surgery: a single institution experience. *J Neurosurgery*.
27. Brown MG, Sillau S, McDermott D, Ernst LD, Spencer DC, Englot DJ, Gonzalez HFJ, Datta P, Karakis I, Becker D, Rolston JD, Arain A, Rao VR, Doherty M, Urban A, Drees C (2022). Concurrent brain-responsive and vagus nerve stimulation for treatment of drug-resistant focal epilepsy. *Epilepsy & Behavior*, 129:108653.
28. Shlobin NA, Campbell JM, Rosenow JM, Rolston JD (2022). Ethical considerations in the surgical and neuromodulatory treatment of epilepsy. *Epilepsy & Behavior*, 127:108524.
29. Slominski E, Marchant J, Judd W, Alexander MD, Rolston JD, Odéen H, Rieke V, Christensen DA, Parker DL (in press). Influence of cerebrospinal fluid on power absorption during transcranial magnetic resonance-guided focused ultrasound treatment. *Medical Physics*.
30. Sperry AJ, Schwehr TJ, Pinegar EK, Richards OB, Rolston JD, Alexander MD, Coats B, Abbott JJ, Kuntz A (in press). Screw-tip Soft Magnetically Steerable Needles. *IEEE Transactions on Medical Robotics and Bionics*.
31. Caston RM, Davis TS, Smith EH, Rahimpour S, Rolston JD (2023). A novel thermoelectric device integrated with a psychophysical paradigm to study pain processing in human subjects. *Journal of Neuroscience Methods*, 386:109780.
32. Kundu B, Arain A, Davis T, Charlebois CM, Rolston JD (2023). Using chronic recordings from a closed-loop neurostimulation system to capture seizures across multiple thalamic nuclei. *Annals of Clinical and Translational Neurology*, 10(1):136-143.
33. Vehar JV, Duff K, Rahimpour S, Dunn D, Ballard DJ, Zorn MS, Moretti P, Rolston J (in press). The cognitive profile of essential tremor on the Repeatable Battery for the Assessment of Neuropsychological Status. *The Clinical Neuropsychologist*.
34. Kundu B, Charlebois CM, Anderson DN, Peters A, Rolston JD (2023). Chronic intracranial recordings after resection for epilepsy reveal a 'running down' of epileptiform activity. *Epilepsia*, 64(7)
35. Ernst LD, Raslan AM, Wabulya A, Shin HW, Cash SS, Yang JC, Sagi V, King-Stephens D, Damisah EC, Ramos A, Hussain B, Toprani S, Brandman DM, Shahlaie K, Kanth K, Arain A, Rolston JD, Berns M, Patel SI, Uysal U (in press). Responsive neurostimulation as a treatment for super-refractory focal status epilepticus: a systematic review and case series. *Journal of Neurosurgery*.
36. Chua MMJ, Vissani M, Liu DD, Schaper FLWVJ, Warren AEL, Caston R, Dworetzky BA, Bublick EJ, Sarkis RA, Cosgrove GR, Rolston JD (in press). Initial case series of a novel sensing deep brain stimulation device in drug-resistant epilepsy and consistent identification of alpha/beta oscillatory activity: A feasibility study. *Epilepsia*.
37. Chua MMJ, Blitz SE, Ng PR, Segar DJ, McDannold NJ, White PJ, Christie S, Hayes MT, Rolston JD, Cosgrove GR (in press). Focused Ultrasound Thalamotomy for Tremor in Parkinson's Disease: Outcomes in a Large, Prospective Cohort. *Mov. Disorders*.
38. Chua MMJ, Warren AEL, Cosgrove GR, Rolston JD (in press). Publication Rates and Characteristics of Clinical Trials in Deep Brain and Responsive Neurostimulation. *Stereotactic and Functional Neurosurgery*.
39. Yearley AG, Chua M, Horn A, Cosgrove GR, Rolston JD (2023). Deep Brain Stimulation Lead Localization Variability Comparing Intraoperative MRI Versus Postoperative Computed Tomography. *Operative Neurosurgery*, 25(5):441-448.
40. Caston RM, Campbell JM, Rahimpour S, Moretti P, Alexander MD, Rolston JD (2023). Hemorrhagic Safety of Magnetic Resonance-Guided Focused Ultrasound Thalamotomy for Tremor without Interruption of Antiplatelet or Anticoagulant Therapy. *Stereotactic and Functional Neurosurgery*, 101(5):314-318.

41. Blitz SE, Chua MMJ, Ng P, Segar DJ, Jha R, McDannold NJ, DeSalvo MN, Rolston JD, Cosgrove GR (2023). Longitudinal MR imaging after unilateral MR-guided focused ultrasound thalamotomy: clinical and radiological correlation. *Frontiers in Neurology*, 6:14:1272425.
42. Arain AM, Mirro EA, Brown D, Peters A, Newman B, Richards S, Rolston JD (in press). Long-Term Intracranial EEG Lateralization of Epileptogenicity in Patients With Confirmed or Suspected Bilateral Mesial Temporal Lobe Onsets During Epilepsy Surgical Evaluation. *Journal of Clinical Neurophysiology*.
43. Caston RM, Smith EH, Davis TS, Singh H, Rahimpour S, Rolston JD (2023). Characterization of

spatiotemporal dynamics of binary and graded tonic pain in humans using intracranial recordings. *PLoS ONE*, 18(10)

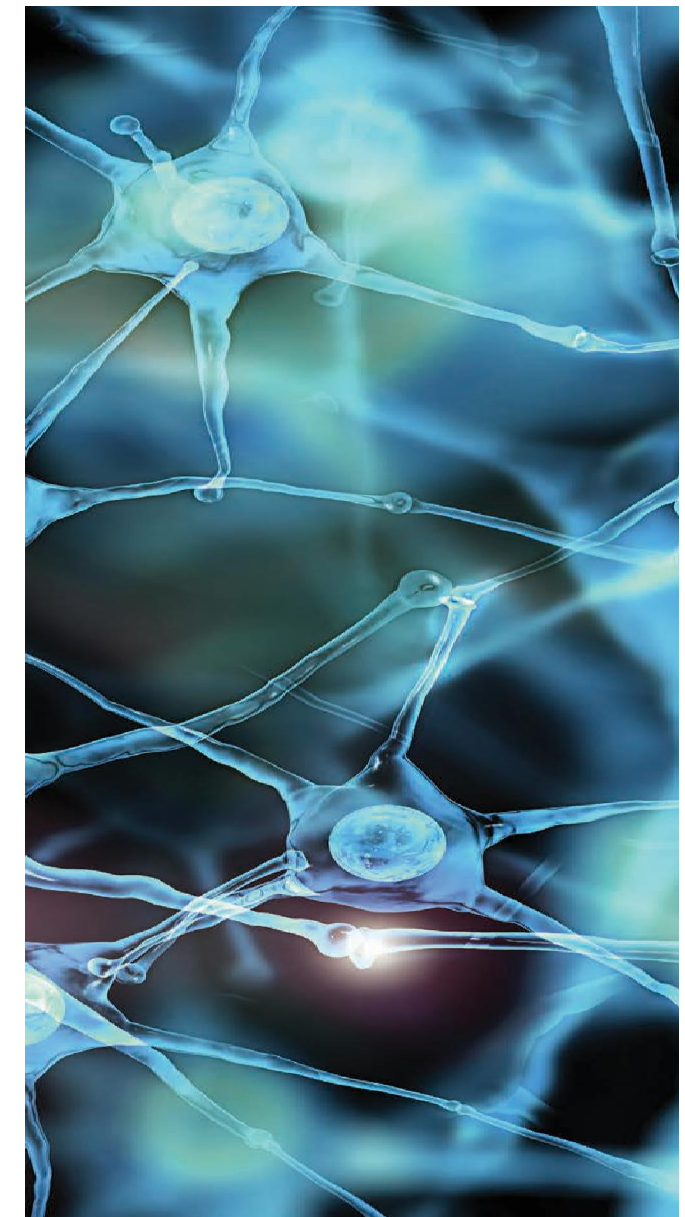
44. Singh H, Osswald CR, Rossman A, Knappe V, Schneider L, Floyd CL, Rolston JD (in press). Preclinical assessment of a noncooled MR thermometry-based neurosurgical laser therapy system. *Journal of Neurosurgery*.
45. Jha R, Liu DD, Gerstl JVE, Renauld S, Kilgallon JL, Blitz SE, Medeiros L, Nawabi NLA, Singh H, Chua MMJ, Tobochnik S, Cosgrove GR, Rolston JD (in press). Comparative effectiveness of stereotactic, subdural, or hybrid intracranial EEG monitoring in epilepsy surgery. *Journal of Neurosurgery*.



46. Clark AM, Ingold A, Reiche CF, Cundy D 3rd, Balsor JL, Federer F, McAlinden N, Cheng Y, Rolston JD, Rieth L, Dawson MD, Mathieson K, Blair S, Angelucci A (2024). An optrode array for spatiotemporally-precise large-scale optogenetic stimulation of deep cortical layers in non-human primates. *Communications Biology*, 7(1):329.
47. Charlebois CM, Anderson DN, Smith EH, Davis TS, Newman BJ, Peters AY, Arain AM, Dorval AD, Rolston JD, Butson CR (in press). Circadian changes in aperiodic activity are correlated with seizure reduction in patients with mesial temporal lobe epilepsy treated with responsive neurostimulation. *Epilepsia*.
48. Cornelissen C, Payne A, Parker DL, Alexander M, Merrill R, Senthilkumar S, Christensen J, Wilcox KS, Odéen H, Rolston JD (in press). Development of an MR-Guided Focused Ultrasound (MRgFUS) Lesioning Approach for the Fornix in the Rat Brain. *Ultrasound in Medicine and Biology*.
49. Yearley AG, Smith EH, Davis TS, Anderson D, Arain AM, Rolston JD (in press). Interictal discharge traveling waves recorded from stereoelectroencephalography electrodes. *Journal of Neurosurgery*.
50. Warren AEL, Butson CR, Hook MP, Dalic LJ, Archer JS, Macdonald-Laurs E, Schaper FLWVJ, Hart LA, Singh H, Johnson L, Bullinger KL, Gross RE, Morrell MJ, Rolston JD (in press). *Brain Communications*.
51. Jha R, Chua MMJ, Sarkis R, Tobochnik S, Rolston JD (in press). Predictors of SOZ localization, subsequent surgical intervention, and seizure outcomes in iEEG. *Annals of Clinical and Translational Neurology*.
52. Kwon CS, Chua MMJ, Jetté N, Rolston JD (in press). A knowledge synthesis of health research reporting standards relevant to epilepsy surgery. *Epilepsia*.
53. Chen JA, Warren AEL, Rolston JD (2024). Robot-assisted deep brain stimulation of the centromedian nucleus of the thalamus for generalized epilepsy: targeting and operative video. *Neurosurgical Focus Video*, 11(1)
54. Jha R, Chua MMJ, Liu DD, Cosgrove GR, Tobochnik S, Rolston JD (in press). Characterization of anti-seizure medication reduction and discontinuation rates

following epilepsy surgery. *Epilepsy & Behavior*.

55. Anderson DN, Charlebois CM, Smith EH, Davis TS, Peters AY, Newman BJ, Arain AM, Wilcox KS, Butson CR, Rolston JD (in press). Closed-loop stimulation in periods with less epileptiform activity drives improved epilepsy outcomes. *Brain*.
56. Singh H, Sawal N, Gupta VK, Jha R, Stamm M, Arjun S, Gupta V, Rolston JD (2024). Increased electrode impedance as an indicator for early detection of deep brain stimulation (DBS) hardware infection: Clinical experience and in vitro study. *Journal of Clinical Neuroscience*, 120:76-81.





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ACADEMIC TITLES

Lecturer, part-time, Harvard Medical School

MEDICAL SCHOOL

Boston University School of Medicine, 1979

RESIDENCY

Duke Hospital - Duke Medical School, Neurosurgery, 1985

FELLOWSHIP

Massachusetts General Hospital, Neurosurgery, 1981

National Institutes of Health, 1989

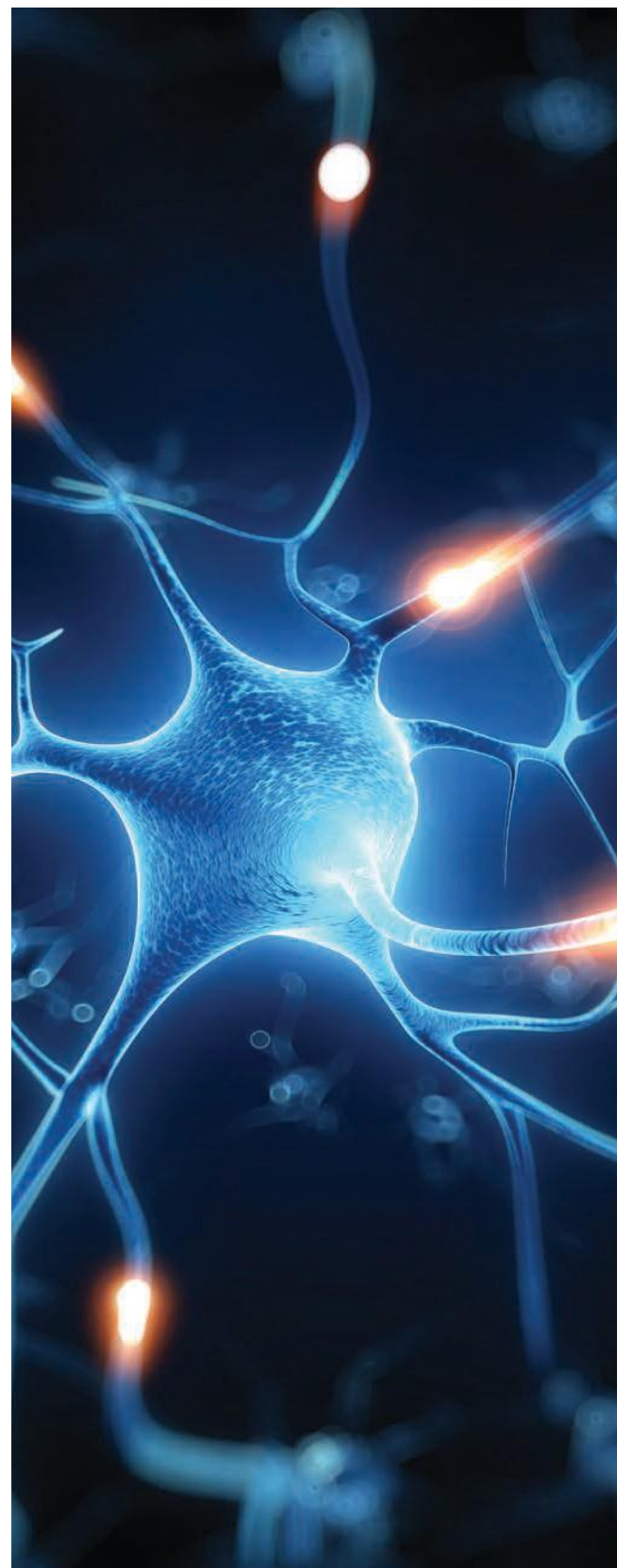
CERTIFICATIONS

Neurological Surgery, 1988

CLINICAL INTERESTS

Cervical radiculopathy, cervical stenosis, disc herniation, hydrocephalus, lumbar radiculopathy, lumbar stenosis, meningiomas, spinal fusion, spondylolisthesis

1. Chua M. J. M., Bazarek S. F., Meredith, D. M., Hsu, L., Saris, S., C. Falcine chondroma: illustrative case. *Journal of Neurosurgery: Case Lessons*, 2021



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DIRECTOR, INTERVENTIONAL PAIN MANAGEMENT

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ACADEMIC TITLE

Instructor in Physical Medicine and Rehabilitation, Harvard Medical School

MEDICAL SCHOOL

George Washington University School of Medicine, 2011

RESIDENCY

New York-Presbyterian/Columbia University and Weill Cornell Medical Center, Physical Medicine and Rehabilitation, 2015

FELLOWSHIP

Massachusetts General Hospital, Pain Management, 2016

CERTIFICATIONS

Physical Medicine & Rehabilitation, 2017
Pain Medicine, 2018

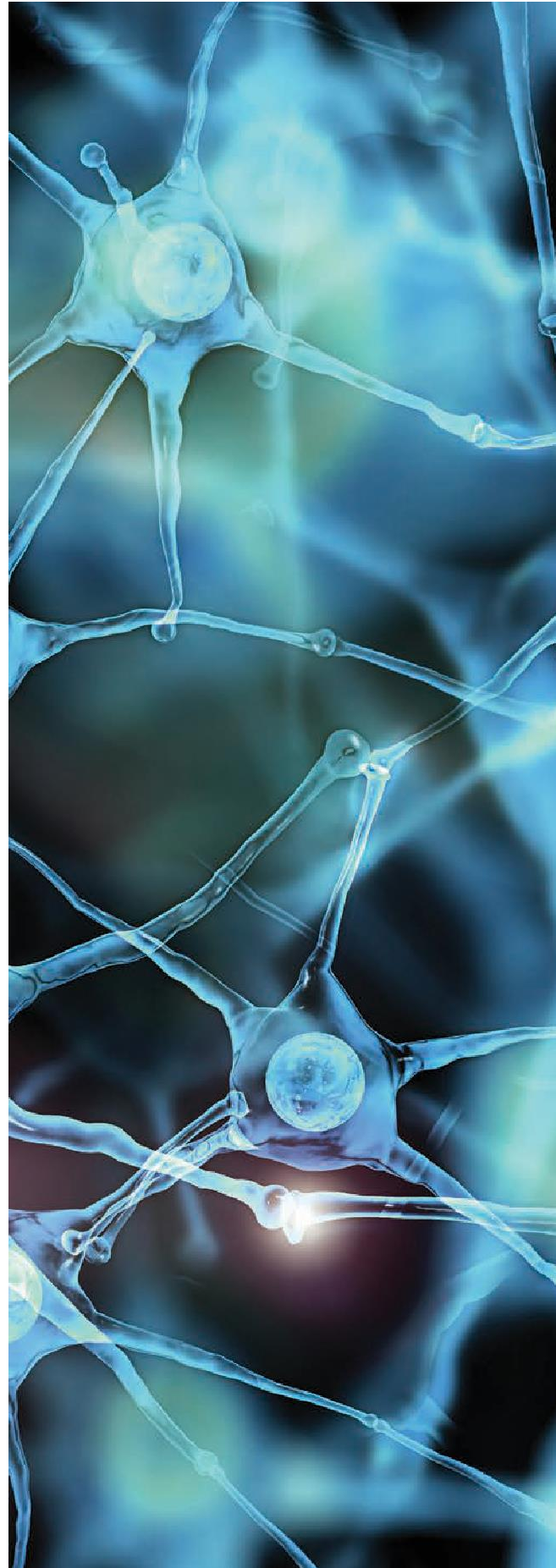
CLINICAL INTERESTS

Interventional Pain Management, Low Back Pain/ Lumbar Spine Disorders, Musculoskeletal Rehabilitation/Exercise Therapy, Myofascial Pain and Trigger Point Injections, Neck Pain/ Cervical Spine Disorders, Sacroiliac Joint Disorders, Sciatica, Spine Arthritis

PUBLICATIONS

1. Barton LB, Arant KR, Blucher JA, Sarno DL, Redmond KJ, Balboni TA, Colman M, Goodwin CR, Laufer I, Placide R, Shin JH, Sciubba DM, Losina E, Katz JN, Schoenfeld AJ. Clinician Experiences in Treatment Decision-Making for Patients with Spinal Metastases: A Qualitative Study. *J Bone Joint Surg Am.* 2021 Jan 6;103(1). doi: 10.2106/JBJS.20.00334. PMID: 33136698; PMCID: PMC8268460.
2. Sarno DL, Ulep RD, Katz NB, Jumreornvong O, Bryan KM, Verduzco-Gutierrez M. Letter to the Editor on "Trends in the Physical Medicine and Rehabilitation Match: Analysis of NRMP Data from 2007 to 2018". *PM R.* 2021 Jul;13(7):801-802. doi: 10.1002/pmrj.12621. Epub 2021 Jun 12. PMID: 33909953.
3. Katz NB, Bryan KM, Jumreornvong O, Sarno DL, Ulep RD, Englander MJ. Re: "Academic Productivity Differences by Gender and Child Age in Science, Technology, Engineering, Mathematics, and Medicine Faculty During the COVID-19 Pandemic" by Krukowski et al. *J Womens Health (Larchmt).* 2021 Jul;30(7):1052-1053. doi: 10.1089/jwh.2021.0238. Epub 2021 Jun 10. PMID: 34115546.
4. Miskin N, Isaac Z, Lu Y, Makhni MC, Sarno DL, Smith TR, Zampini JM, Mandell JC. Simplified Universal Grading of Lumbar Spine MRI Degenerative Findings: Inter-Reader Agreement of Non-Radiologist Spine Experts. *Pain Med.* 2021 Jul 25;22(7):1485-1495. doi: 10.1093/pm/pnab098. PMID: 33713135.
5. Bryan KM, Jumreornvong O, Katz NB, Sarno DL, Ulep RD, Verduzco-Gutierrez M. Reply: "The Physiatry Workforce in 2019 and Beyond Part 2: Modeling Results". *Am J Phys Med Rehabil.* 2021 Oct 1;100(10). doi: 10.1097/PHM.0000000000001765. PMID: 33843759.
6. Sarno DL, Yong RJ, Fields KG, Lim SM, Gilligan CJ, Khan L, Nelson ER. A novel interventional pain simulation-based education curriculum: Implementation to enhance procedural training. *Interv Pain Med.* 2022 Dec 15;1(4):100167. doi: 10.1016/j.inpm.2022.100167. PMID: 39238865; PMCID: PMC11373074.
7. Hunter TL, Sarno DL, Jumreornvong O, Esparza R, Flores LE, Silver JK. The Role of Surgical Prehabilitation During the COVID-19 Pandemic and Beyond. *Phys Med Rehabil Clin N Am.* 2023 Aug;34(3):523-538. doi: 10.1016/j.pmr.2023.03.002. Epub 2023 Apr 4. PMID: 37419529; PMCID: PMC10070767.

8. Fu M, Shen J, Gu C, Oliveira E, Shinchuk E, Isaac H, Isaac Z, Sarno DL, Kurz JL, Silbersweig DA, Onnela JP, Barron DS. The Pain Intervention & Digital Research Program: an operational report on combining digital research with outpatient chronic disease management. *Front Pain Res (Lausanne)*. 2024 Feb 2;5:1327859. doi: 10.3389/fpain.2024.1327859. PMID: 38371228; PMCID: PMC10869590.
9. Sarno DL, Silver EM, Goldstein R, Frontera WR, Silver JK. Rehabilitation clinical trials in global registries: reporting of participant inclusion by sex, age, race and ethnicity. *Disabil Rehabil*. 2024 Jun;46(13):2946-2954. doi: 10.1080/09638288.2023.2231844. Epub 2023 Jul 14. PMID: 37448349.
10. Sarno DL, Landry AI, Oxentenko AS. Letter to the Editor on "The Chief Wellness Officer: A long overdue catalyst for systemic change in Emergency Medicine". *Int J Health Plann Manage*. 2024 Jul;39(4):1195-1197. doi: 10.1002/hpm.3793. Epub 2024 Feb 27. PMID: 38412052.
11. Silver JK, Fleming TK, Ellinas EH, Silver EM, Verduzco-Gutierrez M, Bryan KM, Flores LE, Sarno DL. Individual, organizational, and policy strategies to enhance the retention and a sense of belonging for health care professionals in rehabilitation medicine. *PM R*. 2024 Jul;16(7):772-778. doi: 10.1002/pmrj.13152. Epub 2024 Mar 17. PMID: 38494596.
12. Al-Assi K, Silver EM, Chandrabose R, Ellinas EH, Ansari E, Sarno DL. Re: Friendship as Medicine. *J Am Board Fam Med*. 2024 Jul-Aug;37(4):804. doi: 10.3122/jabfm.2024.240076R0. PMID: 39455268.



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DIRECTOR, ENDOSCOPIC SKULLBASE
FELLOWSHIP

SURGICAL CO-DIRECTOR,
MULTIDISCIPLINARY PITUITARY CENTER

ACADEMIC TITLE

Assistant Professor, Harvard Medical School

MEDICAL SCHOOL

UCLA David Geffen School of Medicine, 2007

University of California, Los Angeles, Medicine, 2007

RESIDENCY

Northwestern Memorial
Hospital, Neurological Surgery,
2014

Northwestern
University/Feinberg Medical
School, 2014

FELLOWSHIP

Brigham and Women's
Hospital, Neurological
Surgery, 2015

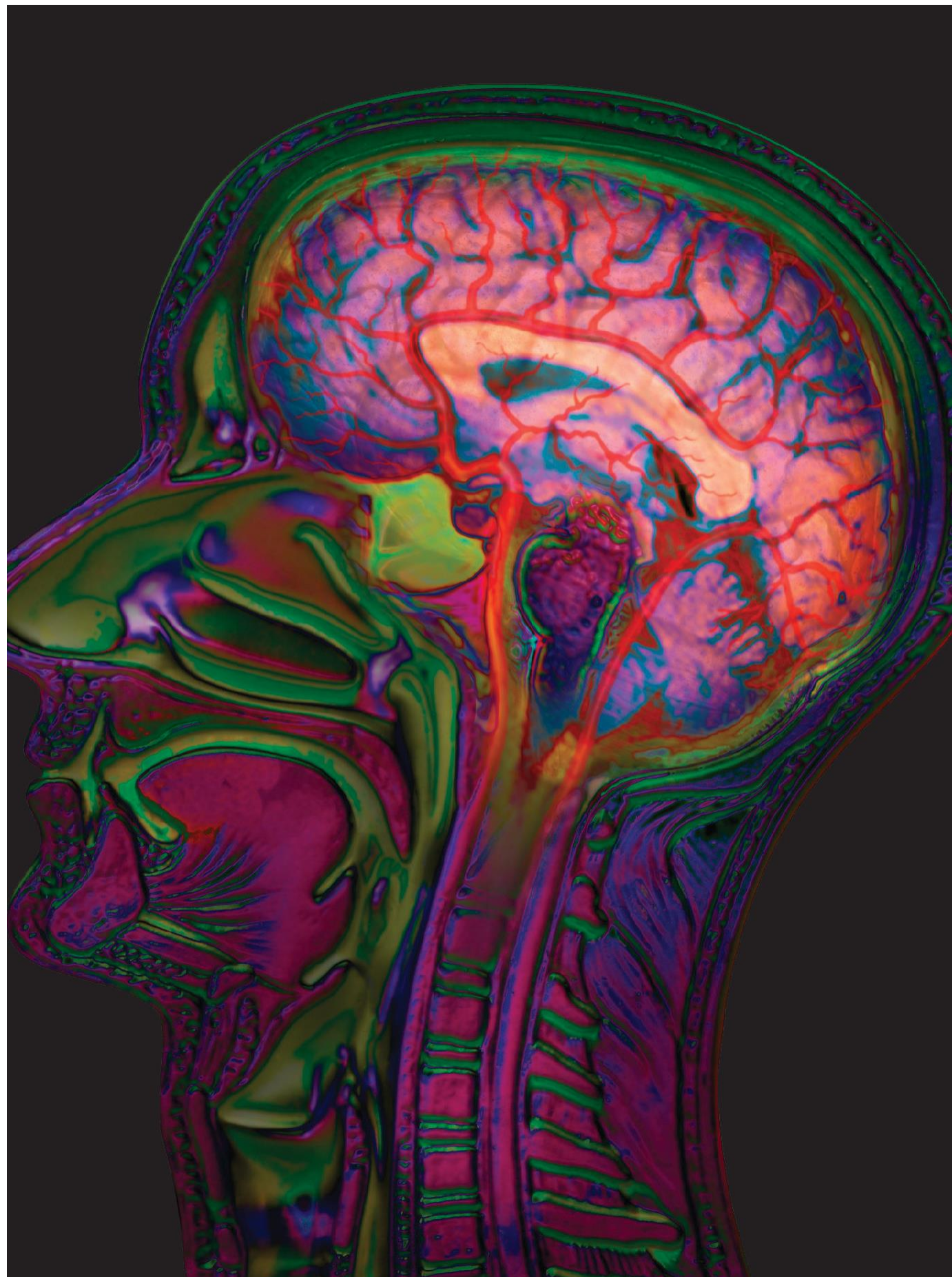
CLINICAL INTERESTS

Brain tumors, craniopharyngioma, disc herniation,
endoscopic neurosurgery, epilepsy, gliomas,
lumbar radiculopathy, lumbar stenosis,
meningiomas, minimally invasive surgery, pituitary
tumors,
skull base neurosurgery, skull base tumors,
spinal disorders, spinal fusion

PUBLICATIONS

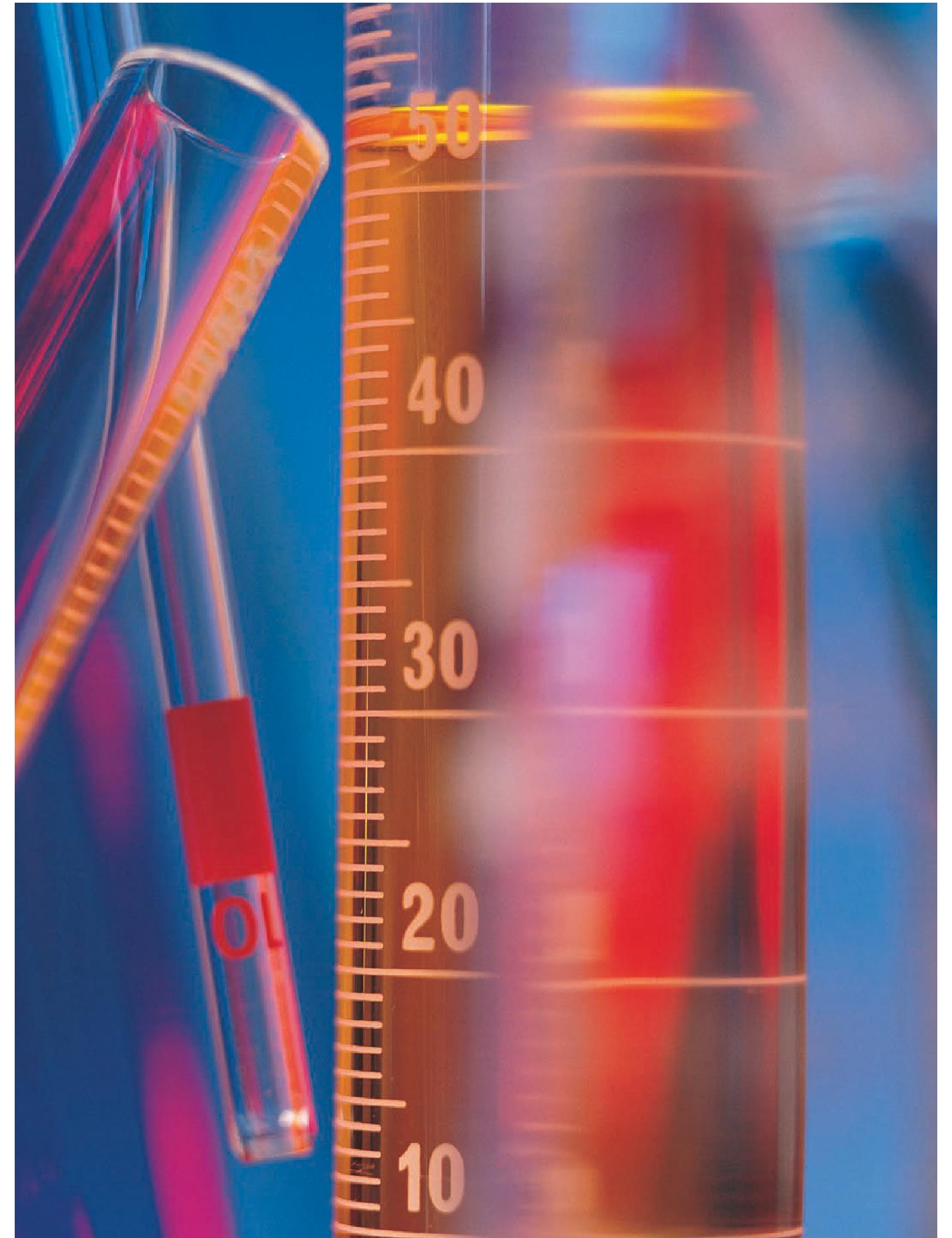
1. Davis FG, Smith TR, Gittleman HR, Ostrom QT, Kruchko C, Barnholtz-Sloan JS. Glioblastoma incidence rate trends in Canada and the United States compared with England, 1995-2015. *Neuro Oncol*. 2020;22(2):301-2. Epub 2019/12/02. doi: 10.1093/neuonc/noz203. PubMed PMID: 31786602; PMCID: PMC7032629.
2. Dobry A, Zogg C, Hodi S, Smith T, Ott P, Iorgulescu B. Management of advanced melanoma: improved survival and barriers to access in a national cohort following the approvals of checkpoint blockade immunotherapies and targeted therapies. *Cancer Immunology Research*. 2020;8(4_Supplement):A99-A.
3. Elledge C, LaVigne A, Wright J, Smith T, McNutt T, Fiksel J, Zeger S, DeWeese T, Alcorn S. Establishing the Prevalence of Complicated Bone Metastases in Community Radiation Oncology Clinics. *International Journal of Radiation Oncology, Biology, Physics*. 2020;108(3):e187-e8.
4. Fidelia I, Lamba N, Papatheodorou SI, Yunusa I, O'Neil K, Chun S, Wilson J, Maher T, Tafel I, Smith TR. Adult spinal deformity surgery: a systematic review of venous thromboprophylaxis and incidence of venous thromboembolic events. *Neurosurgical Review*. 2020;43:923-30.
5. Gupta S, Hulsbergen AFC, Segar DJ, Hauser BM, Bernstock JD, Nazarian RM, Lawrence DP, Nahed BV, Broekman MLD, Smith TR. Central Nervous System-Involving Eccrine Gland Carcinoma: A Clinicopathologic Case Series and Literature Review. *World Neurosurg*. 2020;138:e17-e25. Epub 2020/03/07. doi: 10.1016/j.wneu.2020.01.111. PubMed PMID: 32142948.
6. Gupta S, Iorgulescu JB, Hoffman S, Catalino M, Bernstock JD, Chua M, Segar DJ, Fandino LB, Laws ER, Smith TR. The diagnosis and management of primary and iatrogenic soft tissue sarcomas of the sella. *Pituitary*. 2020;23(5):558-72. Epub 2020/07/03. doi: 10.1007/s11102-020-01062-y. PubMed PMID: 32613388.
7. Harary M, Kavouridis VK, Torre M, Zaidi HA, Chukwueke UN, Reardon DA, Smith TR, Iorgulescu JB. Predictors and early survival outcomes of maximal resection in WHO grade II 1p/19q-codeleted oligodendrogliomas. *Neuro Oncol*. 2020;22(3):369-80. Epub 2019/09/21. doi: 10.1093/neuonc/noz168. PubMed PMID: 31538193; PMCID: PMC7442358.

8. Harary M, Tung JK, Sood S, Corrales CE, Smith T, Iorgulescu JB. Benign purely intraosseous meningioma of the skull: diagnosis and surgical outcomes. *Journal of Clinical Neuroscience*. 2020;82:36-42.
9. Hauser BM, Gupta S, Xu E, Wu K, Bernstock JD, Chua M, Khawaja AM, Smith TR, Dunn IF, Bergmark RW, Bi WL. Impact of insurance on hospital course and readmission after resection of benign meningioma. *J Neurooncol*. 2020;149(1):131-40. Epub 2020/07/13. doi: 10.1007/s11060-020-03581-x. PubMed PMID: 32654076; PMCID: PMC7484429.
10. Hulsbergen AFC, Cho LD, Mammi M, Lamba N, Smith TR, Brastianos PK, Broekman MLD, Lin NU. Systemic therapy following craniotomy in patients with a solitary breast cancer brain metastasis. *Breast Cancer Res Treat*. 2020;180(1):147-55. Epub 2020/01/19. doi: 10.1007/s10549-020-05531-7. PubMed PMID: 31953697; PMCID: PMC7031200.
11. Hulsbergen AFC, Claes A, Kavouridis VK, Ansaripour A, Nogarede C, Hughes ME, Smith TR, Brastianos PK, Verhoeff JJC, Lin NU, Broekman MLD. Subtype switching in breast cancer brain metastases: a multicenter analysis. *Neuro Oncol*. 2020;22(8):1173-81. Epub 2020/01/24. doi: 10.1093/neuonc/noaa013. PubMed PMID: 31970416; PMCID: PMC7471502.
12. Hulsbergen AFC, Mammi M, Nagtegaal SHJ, Lak AM, Kavouridis V, Smith TR, Iorgulescu JB, Mekary RA, Verhoeff JJC, Broekman MLD, Phillips JG. Programmed Death Receptor Ligand One Expression May Independently Predict Survival in Patients With Non-Small Cell Lung Carcinoma Brain Metastases Receiving Immunotherapy. *Int J Radiat Oncol Biol Phys*. 2020;108(1):258-67. Epub 2020/04/27. doi: 10.1016/j.ijrobp.2020.04.018. PubMed PMID: 32335185.
13. Job A, Hulsbergen A, Jhun R, Jessurun C, Smith T, Broekman M. INCREASED RISK OF BREAST CANCER BRAIN METASTASIS WITH EGFR AND Ki-67 EXPRESSION: A SYSTEMATIC REVIEW AND META-ANALYSIS. *Neuro-oncology Advances*. 2020;2(Suppl 2):ii14.
14. Kavouridis VK, Arnaout O, Smith TR. Considering the role of surgery for low-grade glioma in the molecular genetic era Response. *Journal of Neurosurgery*. 2020;133(5):1290-.
15. Lak AM, Abunimer AM, Devi S, Chawla S, Aydin L, Tafel I, Smith TR, Mekary RA, Zaidi HA. Reduction versus In Situ Fusion for Adult High-Grade Spondylolisthesis: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2020;138:512-20.e2. Epub 2020/03/18. doi: 10.1016/j.wneu.2020.03.030. PubMed PMID: 32179186.
16. Lak AM, Lopez CDC, Cha J, Smith TR, Aziz-Sultan MA, Gormley W, Du R, Patel NJ. Interventional Management of Epileptic Seizures Associated with Arteriovenous Malformations: A Systematic Review and Meta-Analysis. *Neurosurgery*. 2020;67(Supplement_1).
17. Lak AM, Zaidi HA, Smith TR. Commentary: Cottonoid Sliders: A Simple and Cost-Effective Tool for Retractorless Intracranial Surgery. *Oper Neurosurg (Hagerstown)*. 2020;19(4):E432-e3. Epub 2020/05/13. doi: 10.1093/ons/opaa129. PubMed PMID: 32396188.
18. Lamba N, Smith T, Iorgulescu B. Clinical and Prognostic Significance of KRAS Mutations For Brain Metastases From Colorectal Adenocarcinoma in the United States. *Neuro-Oncology*. 2020;22(Suppl 2):ii2
19. Lamba N, Smith T, Iorgulescu B. Brain Metastasis Among Female Patients Diagnosed with Stage IV Breast Cancer. *Neuro-oncology*. 2020.
20. Lee CW, Lo YT, Devi S, Seo Y, Simon A, Zborovancik K, Alsheikh MY, Lamba N, Smith TR, Mekary RA, Aglio LS. Gender Differences in Preoperative Opioid Use in Spine Surgery Patients: A Systematic Review and Meta-analysis. *Pain Med*. 2020;21(12):3292-300. Epub 2020/09/30. doi: 10.1093/pm/pnaa266. PubMed PMID: 32989460.
21. Lo YT, Lim-Watson M, Seo Y, Fluetsch N, Alasmari MM, Alsheikh MY, Lamba N, Smith TR, Aglio LS, Mekary RA. Long-Term Opioid Prescriptions After Spine Surgery: A Meta-Analysis of Prevalence and Risk Factors. *World Neurosurg*. 2020;141:e894-e920. Epub 2020/06/23. doi: 10.1016/j.wneu.2020.06.081. PubMed PMID: 32569762.
22. Lu VM, Graffeo CS, Perry A, Link MJ, Meyer FB, Dawood HY, Mekary RA, Smith TR. Pearls for Interpreting Neurosurgical Systematic Reviews and Meta-Analyses: Lessons From a Collaborative Effort. *Neurosurgery*. 2020;87(3):435-41. Epub 2020/03/07. doi: 10.1093/neuros/nyaa027. PubMed PMID: 32140720.
23. Lu VM, Ravindran K, Perry A, Graffeo CS, Dawood HY, Van Gompel JJ, Mekary RA, Smith TR. Recurrence of Rathke's cleft cysts based on gross total resection of cyst wall: a meta-analysis. *Neurosurg Rev*. 2020;43(3):957-66. Epub 2019/05/02. doi: 10.1007/s10143-019-01107-2. PubMed PMID: 31041618.
24. Mammi M, Boaro A, Kavouridis V, Hulsbergen AF, Senders JT, Gormley WB, Smith TR, Arnaout O. Artificial intelligence for management of patients with intracranial neoplasms. *Artificial Intelligence in Precision Health*. Academic Press; 2020. p. 203-30.
25. Meredith D, Chow KH, Kao P-L, Zeng Y, Sinha R, Shetty A, Tolstorukov M, Tran T, Yerrum S, Chukwueke U. Patient-Derived Xenograft and Cell Line Models Facilitate Novel Treatment Discovery in Central Nervous System Lymphomas. *Neuro-Oncology*. 2020;22(Supplement_2):ii235-ii.
26. Mjåset C, Zwart JA, Goedmakers CMW, Smith TR, Solberg TK, Grotle M. Criteria for success after surgery for cervical radiculopathy-estimates for a substantial amount of improvement in core outcome measures. *Spine J*. 2020;20(9):1413-21. Epub 2020/06/06. doi: 10.1016/j.spinee.2020.05.549. PubMed PMID: 32502657.
27. Nagtegaal SHJ, Hulsbergen AFC, van Dorst EBL, Kavouridis VK, Jessurun CAC, Broekman MLD, Smith TR, Verhoeff JJC. Age, pathology and CA-125 are prognostic factors for survival in patients with brain metastases from gynaecological tumours. *Clin Transl Radiat Oncol*. 2020;24:11-5. Epub 2020/07/01. doi: 10.1016/j.ctro.2020.05.001. PubMed PMID: 32596517; PMCID: PMC7306503.
28. Pande A, Lamba N, Mammi M, Gebrehiwet P, Trenary A, Doucette J, Papatheodorou S, Bunevicius A, Smith TR, Mekary RA. Endoscopic third ventriculostomy versus ventriculoperitoneal shunt in pediatric and adult population: a systematic review and meta-analysis. *Neurosurg Rev*. 2020. Epub 2020/06/02. doi: 10.1007/s10143-020-01320-4. PubMed PMID: 32476100.
29. Robertson FC, Esene IN, Koliass AG, Kamalo P, Fieggen G, Gormley WB, Broekman ML, Park KB, Rosenfeld J, Balak N. Task-shifting and task-sharing in neurosurgery: an international survey of current practices in low-and middle-income countries. *World neurosurgery*: X. 2020;6:100059.
30. Robertson FC, Esene IN, Koliass AG, Khan T, Rosseau G, Gormley WB, Park KB, Broekman ML, Rosenfeld J, Balak N. Global perspectives on task shifting and task sharing in neurosurgery. *World neurosurgery*: X. 2020;6:100060.
31. Senders JT, Cho LD, Calvachi P, McNulty JJ, Ashby JL, Schulte IS, Almekkawi AK, Mehrtash A, Gormley WB, Smith TR, Broekman MLD, Arnaout O. Automating Clinical Chart Review: An Open-Source Natural Language Processing Pipeline Developed on Free-Text Radiology Reports From Patients With Glioblastoma. *JCO Clin Cancer Inform*. 2020;4:25-34. Epub 2020/01/25. doi: 10.1200/cci.19.00060. PubMed PMID: 31977252.
32. Senders JT, Cote DJ, Mehrtash A, Wiemann R, Gormley WB, Smith TR, Broekman ML, Arnaout O. Deep learning for natural language processing of free-text pathology reports: a comparison of learning curves. *BMJ Innovations*. 2020;6(4).
33. Senders JT, Staples P, Mehrtash A, Cote DJ, Taphoorn MJB, Reardon DA, Gormley WB, Smith TR, Broekman ML, Arnaout O. An Online Calculator for the Prediction of Survival in Glioblastoma Patients Using Classical Statistics and Machine Learning. *Neurosurgery*. 2020;86(2):E184-e92. Epub 2019/10/06. doi: 10.1093/neuros/nyz403. PubMed PMID: 31586211; PMCID: PMC7061165.
34. Stopa BM, Harary M, Jhun R, Job A, Izzy S, Smith TR, Gormley WB. Divergence in the epidemiological estimates of traumatic brain injury in the United States: comparison of two national databases. *J Neurosurg*. 2020:1-10. Epub 2020/12/01. doi: 10.3171/2020.7.Jns.201896. PubMed PMID: 33254146.
35. Sultan I, Lamba N, Liew A, Doung P, Tewarie I, Amamoo JJ, Gannu L, Chawla S, Doucette J, Cerecedo-Lopez CD, Papatheodorou S, Tafel I, Aglio LS, Smith TR, Zaidi H, Mekary RA. The safety and efficacy of steroid treatment for acute spinal cord injury: A Systematic Review and meta-analysis. *Heliyon*. 2020;6(2):e03414. Epub 2020/02/26. doi: 10.1016/j.heliyon.2020.e03414. PubMed PMID: 32095652; PMCID: PMC7033344.
36. Susano MJ, Grasfield RH, Friese M, Rosner B, Crosby G, Bader AM, Kang JD, Smith TR, Lu Y, Groff MW, Chi JH, Grodstein F, Culley DJ. Brief Preoperative Screening for Frailty and Cognitive Impairment Predicts Delirium after Spine Surgery. *Anesthesiology*. 2020;133(6):1184-91. Epub 2020/09/09. doi: 10.1097/aln.0000000000003523. PubMed PMID: 32898243; PMCID: PMC7657972.
37. Torre M, Lamba N, Gupta S, Smith T, Iorgulescu JB, editors. Care Setting Disparities in 1p/19q Codeletion Testing Rates for Diffuse Gliomas. LABORATORY INVESTIGATION; 2020: NATURE PUBLISHING GROUP 75 VARICK ST, 9TH FLR, NEW YORK, NY 10013-1917 USA.
38. Bernstock JD, Hoffman SE, Chen JA, Gupta S, Kappel AD, Smith TR, Chiocca EA. The Current Landscape of Oncolytic Herpes Simplex Viruses as Novel Therapies for Brain Malignancies. *Viruses*. 2021;13(6). Epub 20210617. doi: 10.3390/v13061158. PubMed PMID: 34204248; PMCID: PMC8234451.



39. Boaro A, Kavouridis VK, Siddi F, Mezzalira E, Harary M, Iorgulescu JB, Reardon DA, Smith TR. Improved outcomes associated with maximal extent of resection for butterfly glioblastoma: insights from institutional and national data. *Acta Neurochir (Wien)*. 2021;163(7):1883-94. Epub 20210419. doi: 10.1007/s00701-021-04844-w. PubMed PMID: 33871698.
40. Boaro A, Leung J, Reeder HT, Siddi F, Mezzalira E, Liu G, Mekary RA, Lu Y, Groff MW, Onnela JP, Smith TR. Smartphone GPS signatures of patients undergoing spine surgery correlate with mobility and current gold standard outcome measures. *J Neurosurg Spine*. 2021;35(6):796-806. Epub 20210827. doi: 10.3171/2021.2.Spine202181. PubMed PMID: 34450590.
41. Buneviciene I, Mekary RA, Smith TR, Onnela JP, Bunevicius A. Can mHealth interventions improve quality of life of cancer patients? A systematic review and meta-analysis. *Crit Rev Oncol Hematol*. 2021;157:103123. Epub 2020/11/16. doi: 10.1016/j.critrevonc.2020.103123. PubMed PMID: 33190065; PMCID: PMC7574857.
42. Calvachi-Prieto P, McAvoy MB, Cerecedo-Lopez CD, Lu Y, Chi JH, Aglio LS, Smith TR, Gormley WB, Groff MW, Mekary RA, Zaidi HA. Expandable Versus Static Cages in Minimally Invasive Lumbar Interbody Fusion: A Systematic Review and Meta-Analysis. *World Neurosurg*. 2021;151:e607-e14. Epub 20210430. doi: 10.1016/j.wneu.2021.04.090. PubMed PMID: 33940268.
43. Castellanos LE, Misra M, Smith TR, Laws ER, Iorgulescu JB. The epidemiology and management patterns of pediatric pituitary tumors in the United States. *Pituitary*. 2021. Epub 2021/01/13. doi: 10.1007/s11102-020-01120-5. PubMed PMID: 33433891.
44. Cote DJ, Samanic CM, Smith TR, Wang M, Smith-Warner SA, Stampfer MJ, Egan KM. Alcohol intake and risk of glioma: results from three prospective cohort studies. *Eur J Epidemiol*. 2021;36(9):965-74. Epub 20210904. doi: 10.1007/s10654-021-00800-1. PubMed PMID: 34482513; PMCID: PMC8859697.
45. Cote DJ, Smith TR, Kaiser UB, Laws ER, Stampfer MJ. Body habitus across the lifespan and risk of pituitary adenoma. *J Clin Endocrinol Metab*. 2021. Epub 2021/01/09. doi: 10.1210/clinem/dgaa987. PubMed PMID: 33417714.
46. Gerstl J, Kilgallon J, Nawabi N, Sinha I, Smith T, Pusic A, Subramanian S, Ranganathan K. The global macroeconomic burden of burn injuries. *Plastic and Reconstructive Surgery-Global Open*. 2021;9(10S):159-60.
47. Goedmakers C, Lak A, Duey A, Senko A, Arnaout O, Groff M, Smith T, Vleggeert-Lankamp C, Zaidi H, Rana A. Predicting adjacent segment disease with deep learning on pre-operative cervical MRI for patients undergoing surgery for cervical radiculopathy. *Brain and Spine*. 2021;1:100405.
48. Goedmakers CMW, Lak AM, Duey AH, Senko AW, Arnaout O, Groff MW, Smith TR, Vleggeert-Lankamp CLA, Zaidi HA, Rana A, Boaro A. Deep Learning for Adjacent Segment Disease at Preoperative MRI for Cervical Radiculopathy. *Radiology*. 2021;301(3):664-71. Epub 20210921. doi: 10.1148/radiol.2021204731. PubMed PMID: 34546126.
49. Gupta S, Dawood H, Giantini Larsen A, Fandino L, Knelson EH, Smith TR, Lee EQ, Aizer A, Dunn IF, Bi WL. Surgical and Peri-Operative Considerations for Brain Metastases. *Front Oncol*. 2021;11:662943. Epub 20210505. doi: 10.3389/fonc.2021.662943. PubMed PMID: 34026641; PMCID: PMC8131835.
50. Hauser BM, Gupta S, Hoffman SE, Zaki MM, Roffler AA, Cote DJ, Lu Y, Chi JH, Groff MW, Khawaja AM, Smith TR, Zaidi HA. Adult sports-related traumatic spinal injuries: do different activities predispose to certain injuries? *J Neurosurg Spine*. 2021:1-7. Epub 20210824. doi: 10.3171/2021.1.Spine201860. PubMed PMID: 35354117.
51. Hulsbergen AFC, Abunimer AM, Ida F, Kavouridis VK, Cho LD, Tewarie IA, Mekary RA, Schucht P, Phillips JG, Verhoeff JJC, Broekman MLD, Smith TR. Neurosurgical resection for locally recurrent brain metastasis. *Neuro Oncol*. 2021;23(12):2085-94. doi: 10.1093/neuonc/noab173. PubMed PMID: 34270740; PMCID: PMC8643471.
52. Kapadia M, Walwema M, Smith TR, Bellinski I, Batjer H, Getch C, Rosenow JM, Bendok BR, Schuele SU. Seizure outcome in patients with cavernous malformation after early surgery. *Epilepsy Behav*. 2021;115:107662. Epub 2020/12/20. doi: 10.1016/j.yebeh.2020.107662. PubMed PMID: 33339740.
53. Kavouridis VK, Calvachi P, Cho CH, Smith TR. Patterns of Interaction Between Diffuse Low-Grade Glioma and Pregnancy: An Institutional Case Series. *World Neurosurg*. 2021;150:e236-e52. Epub 20210309. doi: 10.1016/j.wneu.2021.02.136. PubMed PMID: 33706019.
54. Lak AM, Abunimer AM, Goedmakers CMW, Aglio LS, Smith TR, Makhni M, Mekary RA, Zaidi HA. Single-versus Dual-Attending Surgeon Approach for Spine Deformity: A Systematic Review and Meta-Analysis. *Oper Neurosurg (Hagerstown)*. 2021;20(3):233-41. Epub 2020/12/30. doi: 10.1093/ons/opaa393. PubMed PMID: 33372960.
47. Goedmakers C, Lak A, Duey A, Senko A, Arnaout O, Groff M, Smith T, Vleggeert-Lankamp C, Zaidi H, Rana A. Predicting adjacent segment disease with deep learning on pre-operative cervical MRI for patients undergoing surgery for cervical radiculopathy. *Brain and Spine*. 2021;1:100405.

55. Lak AM, Lamba N, Pompilus F, Yunusa I, King A, Sultan I, Amamoo J, Al-Otaibi NM, Alasmari M, Zaghloul I, Aglio L, Cerecedo-Lopez CD, Tafel I, Smith TR, Mekary RA, Zaidi H. Minimally invasive versus open surgery for the correction of adult degenerative scoliosis: a systematic review. *Neurosurg Rev.* 2021;44(2):659-68. Epub 20200312. doi: 10.1007/s10143-020-01280-9. PubMed PMID: 32166508.
56. Lak AM, Siddi F, Ida F, Zaidi HA, Smith TR, Lu Y. Failure to achieve pelvic balance following hip replacement surgery may be a risk factor for development of degenerative scoliosis. *Interdisciplinary Neurosurgery.* 2021;25:101242.
57. McAvoy M, Prieto PC, Kaczmarzyk JR, Fernández IS, McNulty J, Smith T, Yu K-H, Gormley WB, Arnaout O. Classification of glioblastoma versus primary central nervous system lymphoma using convolutional neural networks. *Scientific reports.* 2021;11(1):15219.
58. Miskin N, Isaac Z, Lu Y, Makhni MC, Sarno DL, Smith TR, Zampini JM, Mandell JC. Simplified Universal Grading of Lumbar Spine MRI Degenerative Findings: Inter-Reader Agreement of Non-Radiologist Spine Experts. *Pain Med.* 2021;22(7):1485-95. doi: 10.1093/pm/pnab098. PubMed PMID: 33713135.
59. Nayak L, Molinaro AM, Peters K, Clarke JL, Jordan JT, de Groot J, Nghiempfu L, Kaley T, Colman H, McCluskey C, Gaffey S, Smith TR, Cote DJ, Severgnini M, Yearley JH, Zhao Q, Blumenschein WM, Duda DG, Muzikansky A, Jain RK, Wen PY, Reardon DA. Randomized Phase II and Biomarker Study of Pembrolizumab plus Bevacizumab versus Pembrolizumab Alone for Patients with Recurrent Glioblastoma. *Clin Cancer Res.* 2021;27(4):1048-57. Epub 2020/11/18. doi: 10.1158/1078-0432.Ccr-20-2500. PubMed PMID: 33199490.
60. Pande A, Lamba N, Mammi M, Gebrehiwet P, Trenary A, Doucette J, Papatheodorou S, Bunevicius A, Smith TR, Mekary RA. Endoscopic third ventriculostomy versus ventriculoperitoneal shunt in pediatric and adult population: a systematic review and meta-analysis. *Neurosurg Rev.* 2021;44(3):1227-41. Epub 20200531. doi: 10.1007/s10143-020-01320-4. PubMed PMID: 32476100.
61. Siddi F, Amedume A, Boaro A, Shah A, Abunimer AM, Bain PA, Cellini J, Regestein QR, Smith TR, Mekary RA. Mobile health and neurocognitive domains evaluation through smartphones: A meta-analysis. *Comput Methods Programs Biomed.* 2021;212:106484. Epub 20211022. doi: 10.1016/j.cmpb.2021.106484. PubMed PMID: 34736169.
62. Siddi F, Emedom-Nnamdi P, Catalino M, Boaro A, Dawood H, Onnela J-P, Smith T. Digital Phenotypic Assessment in Neuro-Oncology (DANO): tracking changes in sociability in patients undergoing treatment for brain malignancies. *Brain and Spine.* 2021;1:100812.
63. Smith TR, Stopa BM, Goedmakers CM, Rana A. Team-Based Decision-Making in Traumatic Brain Injury. *Traumatic Brain Injury: Science, Practice, Evidence and Ethics.* 2021:285-94.
64. Stopa BM, Tahir Z, Mezzalira E, Boaro A, Khawaja A, Grashow R, Zafonte RD, Smith TR, Gormley WB, Izzy S. The Impact of Age and Severity on Dementia After Traumatic Brain Injury: A Comparison Study. *Neurosurgery.* 2021;89(5):810-8. doi: 10.1093/neuros/nyab297. PubMed PMID: 34392366.
65. Tewarie IA, Jessurun CAC, Hulsbergen AFC, Smith TR, Mekary RA, Broekman MLD. Leptomeningeal disease in neurosurgical brain metastases patients: A systematic review and meta-analysis. *Neurooncol Adv.* 2021;3(1):vdab162. Epub 20211110. doi: 10.1093/noajnl/vdab162. PubMed PMID: 34859226; PMCID: PMC8633671.
66. Tewarie IA, Senders JT, Kremer S, Devi S, Gormley WB, Arnaout O, Smith TR, Broekman MLD. Survival prediction of glioblastoma patients-are we there yet? A systematic review of prognostic modeling for glioblastoma and its clinical potential. *Neurosurg Rev.* 2021;44(4):2047-57. Epub 20201106. doi: 10.1007/s10143-020-01430-z. PubMed PMID: 33156423; PMCID: PMC8338817.
67. Wang F, Catalino MP, Bi WL, Dunn IF, Smith TR, Guo Y, Hordejuk D, Kaiser UB, Laws ER, Min L. Postoperative Day 1 Morning Cortisol Value as a Biomarker to Predict Long-term Remission of Cushing Disease. *J Clin Endocrinol Metab.* 2021;106(1):e94-e102. Epub 2020/10/28. doi: 10.1210/clinem/dgaa773. PubMed PMID: 33108450.
68. Abunimer AM, Lak AM, Calvachi P, Smith TR, Aglio LS, Almefty KK, Dunn IF, Bi WL, Goldhaber SZ, Almefty O. Early Detection and Management of Venous Thrombosis in Skull Base Surgery: Role of Routine Doppler Ultrasound Monitoring. *Neurosurgery.* 2022. Epub 20220407. doi: 10.1227/neu.0000000000001936. PubMed PMID: 35383697.



69. Blitz SE, Kappel AD, Gessler FA, Klinger NV, Arnaout O, Lu Y, Peruzzi PP, Smith TR, Chiocca EA, Friedman GK, Bernstock JD. Tumor-Associated Macrophages/Microglia in Glioblastoma Oncolytic Virotherapy: A Double-Edged Sword. *Int J Mol Sci.* 2022;23(3). Epub 20220204. doi: 10.3390/ijms23031808. PubMed PMID: 35163730; PMCID: PMC8836356.
70. Boaro A, Mahadik B, Petrillo A, Siddi F, Devi S, Chawla S, Abunimer AM, Feletti A, Fiorindi A, Longatti P, Sala F, Smith TR, Mekary RA. Efficacy and safety of flexible versus rigid endoscopic third ventriculostomy in pediatric and adult populations: a systematic review and meta-analysis. *Neurosurg Rev.* 2022;45(1):199-216. Epub 20210625. doi: 10.1007/s10143-021-01590-6. PubMed PMID: 34173114; PMCID: PMC8827229.
71. Castellanos LE, Gutierrez C, Smith T, Laws ER, Iorgulescu JB. Epidemiology of common and uncommon adult pituitary tumors in the U.S. according to the 2017 World Health Organization classification. *Pituitary.* 2022;25(1):201-9. Epub 20210927. doi: 10.1007/s11102-021-01189-6. PubMed PMID: 34580820
72. Chawla S, Kavouridis VK, Boaro A, Korde R, Amaral Medeiros S, Edrees H, Mezzalira E, Sala F, Mekary RA, Smith TR. Surgery vs. Biopsy in the Treatment of Butterfly Glioblastoma: A Systematic Review and Meta-Analysis. *Cancers (Basel).* 2022;14(2). Epub 20220109. doi: 10.3390/cancers14020314. PubMed PMID: 35053478; PMCID: PMC8773472.
73. Cote DJ, Kilgallon JL, Nawabi NLA, Dawood HY, Smith TR, Kaiser UB, Laws ER, Manson JE, Stampfer MJ. Oral Contraceptive and Menopausal Hormone Therapy Use and Risk of Pituitary Adenoma: Cohort and Case-Control Analyses. *J Clin Endocrinol Metab.* 2022;107(4):e1402-e12. doi: 10.1210/clinem/dgab868. PubMed PMID: 34865056; PMCID: PMC8947212.
74. Cote DJ, Smith TR, Kaiser UB, Laws ER, Jr., Stampfer MJ. Alcohol intake and risk of pituitary adenoma. *Cancer Causes Control.* 2022;33(2):353-61. Epub 20220104. doi: 10.1007/s10552-021-01523-0. PubMed PMID: 34982318.
75. Francis SS, Ostrom QT, Cote DJ, Smith TR, Claus E, Barnholtz-Sloan JS. The Epidemiology of Central Nervous System Tumors. *Hematol Oncol Clin North Am.* 2022;36(1):23-42. doi: 10.1016/j.hoc.2021.08.012. PubMed PMID: 34801162.
76. Gerritsen J, Zwarthoed R, Versyck G, Jessurun C, Pruijn K, Fisher F, Kilgallon J, Nawabi N, Larivière E, Solie L. Awake Craniotomy Within Glioblastoma Subgroups (GLIOMAP study). *Neurosurgery.* 2022;68(Supplement_1):138.
77. Gerritsen JKW, Zwarthoed RH, Kilgallon JL, Nawabi NL, Jessurun CAC, Versyck G, Pruijn KP, Fisher FL, Larivière E, Solie L, Mekary RA, Satoer DD, Schouten JW, Bos EM, Kloet A, Nandoe Tewarie R, Smith TR, Dirven CMF, De Vleeschouwer S, Broekman MLD, Vincent A. Effect of awake craniotomy in glioblastoma in eloquent areas (GLIOMAP): a propensity score-matched analysis of an international, multicentre, cohort study. *Lancet Oncol.* 2022;23(6):802-17. Epub 20220512. doi: 10.1016/s1470-2045(22)00213-3. PubMed PMID: 35569489
78. Gerritsen JKW, Zwarthoed RH, Kilgallon JL, Nawabi NL, Versyck G, Jessurun CAC, Pruijn KP, Fisher FL, Larivière E, Solie L, Mekary RA, Satoer DD, Schouten JW, Bos EM, Kloet A, Nandoe Tewarie R, Smith TR, Dirven CMF, De Vleeschouwer S, Vincent A, Broekman MLD. Impact of maximal extent of resection on postoperative deficits, patient functioning and survival within clinically important glioblastoma subgroups. *Neuro Oncol.* 2022. Epub 20221124. doi: 10.1093/neuonc/noac255. PubMed PMID: 36420703.
79. Gerstl JVE, Rendon LF, Burke SM, Doucette J, Mekary RA, Smith TR. Complications and cosmetic outcomes of materials used in cranioplasty following decompressive craniectomy-a systematic review, pairwise meta-analysis, and network meta-analysis. *Acta Neurochir (Wien).* 2022. Epub 20220520. doi: 10.1007/s00701-022-05251-5. PubMed PMID: 35593924.
80. Gerstl JVE, Yearley AG, Kilgallon JL, Lassarén P, Robertson FC, Herdell V, Wang AY, Segar DJ, Bernstock JD, Laws ER, Ranganathan K, Smith TR. A national stratification of the global macroeconomic burden of central nervous system cancer. *J Neurosurg.* 2022;1-9. Epub 20221021. doi: 10.3171/2022.9.Jns221499. PubMed PMID: 36272121.
81. Hauser BM, Hoffman SE, Gupta S, Zaki MM, Xu E, Chua M, Bernstock JD, Khawaja A, Smith TR, Proctor MR, Zaidi HA. Association of venous thromboembolism following pediatric traumatic spinal injuries with injury severity and longer hospital stays. *J Neurosurg Spine.* 2022;36(1):153-9. Epub 20210917. doi: 10.3171/2021.3.Spine201981. PubMed PMID: 34534962.
82. Hauser BM, McNulty J, Zaki MM, Gupta S, Cote DJ, Bernstock JD, Lu Y, Chi JH, Groff MW, Khawaja AM, Smith TR, Zaidi HA. Predictors of thoracic and lumbar spine injuries in patients with TBI: A nationwide analysis. *Injury.* 2022;53(3):1087-93. Epub 20211002. doi: 10.1016/j.injury.2021.09.060. PubMed PMID: 34625238; PMCID: PMC8863622.
83. Hoffman SE, Hauser BM, Zaki MM, Gupta S, Chua M, Bernstock JD, Khawaja AM, Smith TR, Zaidi HA. Spinal level and cord involvement in the prediction of sepsis development after vertebral fracture repair for traumatic spinal injury. *J Neurosurg Spine.* 2022;1-7. Epub 20220204. doi: 10.3171/2021.12.Spine21423. PubMed PMID: 35120317.
84. Hulsbergen AFC, Lo YT, Awakimjan I, Kavouridis VK, Phillips JG, Smith TR, Verhoeff JJC, Yu KH, Broekman MLD, Arnaout O. Survival Prediction After Neurosurgical Resection of Brain Metastases: A Machine Learning Approach. *Neurosurgery.* 2022;91(3):381-8. Epub 20220526. doi: 10.1227/neu.0000000000002037. PubMed PMID: 35608378.
85. Jessurun CAC, Hulsbergen AFC, Lamba N, Nandoe Tewarie RDS, Smith TR, Broekman MLD. Practice Variation in Perioperative Steroid Dosing for Brain Tumor Patients: An International Survey. *World Neurosurg.* 2022;159:e431-e41. Epub 20211224. doi: 10.1016/j.wneu.2021.12.067. PubMed PMID: 34958992.
86. Kilgallon JL, Tewarie IA, Broekman MLD, Rana A, Smith TR. Passive Data Use for Ethical Digital Public Health Surveillance in a Postpandemic World. *J Med Internet Res.* 2022;24(2):e30524. Epub 20220215. doi: 10.2196/30524. PubMed PMID: 35166676; PMCID: PMC8889482.
87. Lamba N, McAvoy M, Kavouridis VK, Smith TR, Touat M, Reardon DA, Iorgulescu JB. Short-term outcomes associated with temozolomide or PCV chemotherapy for 1p/19q-codeleted WHO grade 3 oligodendrogliomas: A national evaluation. *Neurooncol Pract.* 2022;9(3):201-7. Epub 20220114. doi: 10.1093/nop/npac004. PubMed PMID: 35601971; PMCID: PMC9113268.
88. Lassarén P, Tewarie IA, Gerstl JVE, Florman JE, Smith TR, Broekman MLD. Telemedicine and the right to health: A neurosurgical perspective. *J Clin Neurosci.* 2022;102:71-4. Epub 20220620. doi: 10.1016/j.jocn.2022.06.011. PubMed PMID: 35738183.
89. Montaser AS, Cho EY, Catalino MP, Hanna J, Smith TR, Laws ER. A Surgical Perspective on the Association between Cystic Lesions of the Pineal Gland (Descartes' Seat of the Soul) and the Pituitary (the Master Gland). *J Neurol Surg B Skull Base.* 2022;83(Suppl 2):e598-e602. Epub 20210924. doi: 10.1055/s-0041-1735635. PubMed PMID: 35832948; PMCID: PMC9272301.
90. Raghu ALB, Chen JA, Valdes PA, Essayed W, Claus E, Arnaout O, Smith TR, Chiocca EA, Peruzzi PP, Bernstock JD. Cerebellar High-Grade Glioma: A Translationally Oriented Review of the Literature. *Cancers (Basel).* 2022;15(1). Epub 20221228. doi: 10.3390/cancers15010174. PubMed PMID: 36612169; PMCID: PMC9818238.
91. Rendon LF, Tewarie IA, Cote DJ, Gabriel A, Smith TR, Broekman MLD, Mekary RA. Gliomas: A Systematic Review of the Preclinical Studies and Meta-Analysis of the Clinical Literature. *Drugs.* 2022;82(3):293-310. Epub 20220205. doi: 10.1007/s40265-021-01668-x. PubMed PMID: 35122635.
92. Senders JT, Maas SLN, Draaisma K, McNulty JJ, Ashby JL, Hofer I, van Solinge WW, Berg MT, Snijders TJ, Seute T, Robe PA, Gormley WB, Smith TR, Broekman MLD. International practice variation in perioperative laboratory testing in glioblastoma patients-a retrospective cohort study. *Acta Neurochir (Wien).* 2022;164(2):385-92. Epub 20220107. doi: 10.1007/s00701-021-05090-w. PubMed PMID: 34997355; PMCID: PMC8854260.
93. Singh T, Nawabi N, Lassarén P, Patel Y, Lepard J, Frankhauser F, Smith T, Mekary R. OP9 States with Tort Reforms: A Systematic Review to Evaluate the Impact on Claims Frequency, Imaging Rates, Physician Supply and Malpractice Insurance Premiums. *Value in Health.* 2022;25(7):S540.
94. Smith TR, Foley KT, Boruah S, Slotkin JR, Woodard E, Lazor JB, Cavaleri C, Brown MC, McDonough B, Hess B, Van Citters DW. Use of adhesive cranial bone flap fixation without hardware to improve mechanical strength, resist cerebrospinal fluid leakage, and maintain anatomical alignment: a laboratory study. *J Neurosurg.* 2022;1-11. Epub 20221216. doi: 10.3171/2022.10.Jns221657. PubMed PMID: 36681962.
95. Smith TR, Foley KT, Slotkin J, Woodard EJ, Lazor JB, Boruah S, Cavaleri C, Brown MC, McDonough B, Van Citters DW. Novel Osteoconductive, Bioresorbable Bone Adhesive Provides Superior Cranial Flap Fixation Strength and Reduced CSF Leak Potential in a Cadaver Model. *Neurosurgery.* 2022;68(Supplement_1):84-5.
96. Stopa BM, Leyva OA, Harper CN, Truman KA, Corrales CE, Smith TR, Gormley WB. Decreased Incidence of CSF Leaks after Skull Base Fractures in the 21st Century: An Institutional Report. *J Neurol Surg B Skull Base.* 2022;83(1):59-65. Epub 20201016. doi: 10.1055/s-0040-1716689. PubMed PMID: 35155071; PMCID: PMC8824620.
97. Tewarie IA, Hulsbergen AFC, Jessurun CAC, Rendon LF, Mekary RA, Smith TR, Broekman MLD. Risk Factors of Second Local Recurrence in Surgically Treated Recurrent Brain Metastases: An Exploratory Analysis. *World Neurosurg.* 2022. Epub 20220824. doi: 10.1016/j.wneu.2022.08.066. PubMed PMID: 36028114.

98. Tewarie IA, Senko AW, Jessurun CAC, Zhang AT, Hulsbergen AFC, Rendon L, McNulty J, Broekman MLD, Peng LC, Smith TR, Phillips JG. Predicting leptomeningeal disease spread after resection of brain metastases using machine learning. *J Neurosurg.* 2022;1-9. Epub 20221021. doi: 10.3171/2022.8.Jns22744. PubMed PMID: 36272119.

99. Yakkala VK, Mammi M, Lamba N, Kandikatla R, Paliwal B, Elshibiny H, Corrales CE, Smith TR, Mekary RA. Audiovestibular symptoms and facial nerve function comparing microsurgery versus SRS for vestibular schwannomas: a systematic review and meta-analysis. *Acta Neurochir (Wien).* 2022. Epub 20220813. doi: 10.1007/s00701-022-05338-z. PubMed PMID: 35962847.

100. Yearley AG, Blitz SE, Patel RV, Chan A, Baird LC, Friedman GK, Arnaout O, Smith TR, Bernstock JD. Machine Learning in the Classification of Pediatric Posterior Fossa Tumors: A Systematic Review. *Cancers (Basel).* 2022;14(22). Epub 20221115. doi: 10.3390/cancers14225608. PubMed PMID: 36428701; PMCID: PMC9688156.

101. Yearley AG, Iorgulescu JB, Chiocca EA, Peruzzi PP, Smith TR, Reardon DA, Mooney MA. The current

state of glioma data registries. *Neurooncol Adv.* 2022;4(1):vdac099. Epub 20220624. doi: 10.1093/noajnl/vdac099. PubMed PMID: 36196363; PMCID: PMC9521197.

102. Ben-Shlomo N, Mudry A, Naples J, Walsh J, Smith TR, Laws ER, Corrales CE. Hajek and Hirsch: Otolaryngology Pioneers of Endonasal Transsphenoidal Pituitary Surgery. *Laryngoscope.* 2023;133(4):807-13. Epub 20221124. doi: 10.1002/lary.30496. PubMed PMID: 36420787; PMCID: PMC10023270./neuonc/noac255. PubMed PMID: 36420703.

103. Dabbagh Ohadi MA, Aleyasin MS, Samiee R, Bordbar S, Maroufi SF, Bayan N, Hanaei S, Smith TR. Micro RNAs as a Diagnostic Marker between Glioma and Primary CNS Lymphoma: A Systematic Review. *Cancers (Basel).* 2023;15(14). Epub 20230714. doi: 10.3390/cancers15143628. PubMed PMID: 37509289.

104. Duey A, Rana A, Hussein H, Siddi F, Onnela J, Smith TR. Extraction and Analysis of Speech Features to Understand Audio Phenotypes of Pain. *Neurosurgery.* 2023;69(Supplement_1):90.

105. Duey A, Rana A, Siddi F, Hussein H, Onnela J, Smith TR. Pain Prediction Using Digital Phenotyping Speech Data for Neurological Spine Disease Patients. *Neurosurgery.* 2023;69(Supplement_1):24.

106. Duey AH, Rana A, Siddi F, Hussein H, Onnela JP, Smith TR. Daily Pain Prediction Using Smartphone Speech Recordings of Patients With Spine Disease. *Neurosurgery.* 2023. Epub 20230330. doi: 10.1227/neu.0000000000002474. PubMed PMID: 36995101.

107. Findlay MC, Drexler R, Khan M, Cole KL, Karbe A, Rotermund R, Ricklefs FL, Flitsch J, Smith TR, Kilgallon JL, Honegger J, Nasi-Kordhishti I, Gardner PA, Gersey ZC, Abdallah HM, Jane JA, Jr., Marino AC, Knappe UJ, Uksul N, Rzaev JA, Galushko EV, Gormolysova EV, Bervitskiy AV, Schroeder HWS, Eördögh M, Losa M, Mortini P, Gerlach R, Antunes ACM, Couldwell WT, Budohoski KP, Rennert RC, Azab M, Karsy M. A Multicenter, Propensity Score-Matched Assessment of Endoscopic Versus Microscopic Approaches in the Management of Pituitary Adenomas. *Neurosurgery.* 2023. Epub 20230414. doi: 10.1227/neu.0000000000002497. PubMed PMID: 37057921.

108. Gerritsen J, Zwarthoed R, Kilgallon J, Nawabi N, Jessurun C, Versyck G, Pruijn K, Fisher F, Larivière E, Solie L. Impact of Awake Craniotomy within Eloquent Glioblastoma Subgroups (GLIOMAP): A Propensity-Score Matched Analysis of an International, Multicenter, Cohort Study. *Neurosurgery.* 2023;69(Supplement_1):50.

109. Gerstl JVE, Blitz SE, Qu QR, Yearley AG, Lassarén P, Lindberg R, Gupta S, Kappel AD, Vicenty-Padilla JC, Gaude E, Atchaneeyasakul KC, Desai SM, Yavagal DR, Peruzzotti-Jametti L, Patel NJ, Aziz-Sultan MA, Du R, Smith TR, Bernstock JD. Global, Regional, and National Economic Consequences of Stroke. *Stroke.* 2023. Epub 20230727. doi: 10.1161/strokeaha.123.043131. PubMed PMID: 37497672.

110. Gupta S, Nawabi NL, Emani S, Medeiros L, Bernstock JD, Duvall J, Ng P, Smith TR, Wen PY, Reardon DA, Arnaout O. An expanded role for surgery in grade 3 1p/19q co-deleted oligodendroglioma. *Neurooncol Adv.* 2023;5(1):vdad046. Epub 20230421. doi: 10.1093/noajnl/vdad046. PubMed PMID: 37215951; PMCID: PMC10195195.

111. Hervey-Jumper SL, Zhang Y, Phillips JJ, Morshed RA, Young JS, McCoy L, Lafontaine M, Luks T, Ammanuel S, Kakaizada S. Interactive effects of molecular, therapeutic, and patient factors on outcome of diffuse low-grade glioma. *Journal of Clinical Oncology.* 2023;41(11):2029-42.

112. Hordejuk D, Cheung Y-MM, Wang W, Smith T, Laws E,

Kaiser UB, Min L. Long-Term Changes in the Size of Pituitary Microadenomas. *Annals of Internal Medicine.* 2023;176(3):298-302.

113. Kilgallon JL, Khanna S, Dey T, Smith TR, Ranganathan K. Open(ing) Access: Top Health Publication Availability to Researchers in Low- and Middle-Income Countries. *Ann Glob Health.* 2023;89(1):40. Epub 20230605. doi: 10.5334/aogh.3904. PubMed PMID: 37304940; PMCID: PMC10253233.

114. Lebouille-Veldman AB, Singh T, Patel Y, Lassarén P, Nawabi N, Frankhauser F, Mammi M, Khawaja A, Mekary RA, Lepard JR, Smith TR. The impact of tort reforms on the neurosurgical malpractice environment: a systematic review of literature. *World Neurosurg.* 2023. Epub 20230221. doi: 10.1016/j.wneu.2023.02.072. PubMed PMID: 36822400.

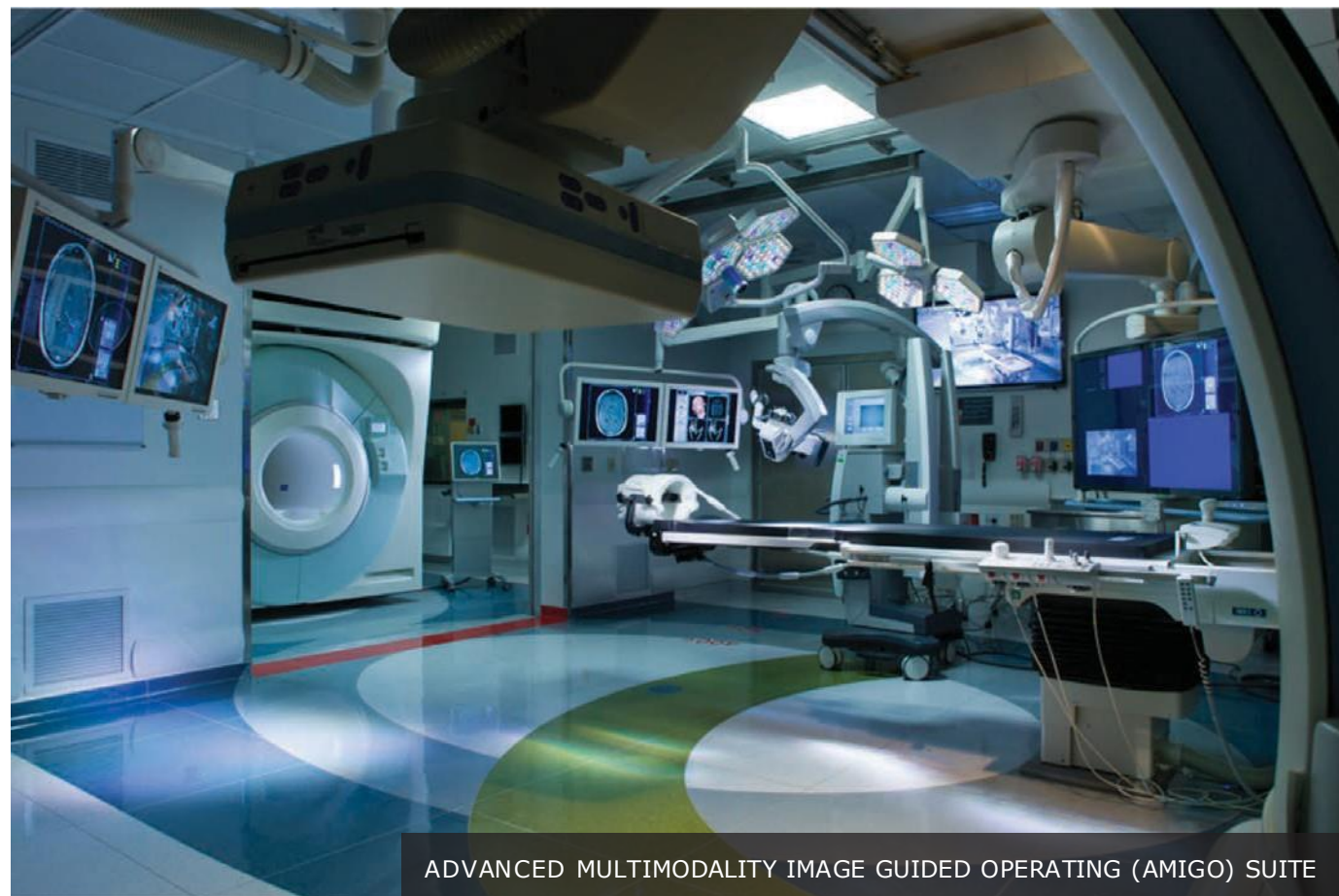
115. McNulty J, Nawabi N, Kilgallon J, Stopa BM, Smith TR. Evaluating the Utility of Repeat CT Scans in Patients With Isolated Traumatic Subarachnoid Hemorrhage. *Neurosurgery.* 2023;69(Supplement_1):48.

116. Tangsrivimol JA, Schonfeld E, Zhang M, Veeravagu A, Smith TR, Härtl R, Lawton MT, El-Sherbini AH, Prevedello DM, Glicksberg BS, Krittanaawong C. Artificial Intelligence in Neurosurgery: A State-of-the-Art Review from Past to Future. *Diagnostics (Basel).* 2023;13(14). Epub 20230720. doi: 10.3390/diagnostics13142429. PubMed PMID: 37510174.

117. Yearley AG, Goedmakers CM, Panahi A, Rana A, Doucette J, Ranganathan K, Smith TR. FDA-approved machine learning algorithms in neuroradiology: A systematic review of the current evidence for approval. *Artificial Intelligence in Medicine.* 2023;102607./s40265-021-01668-x. PubMed PMID: 35122635.

118. Findlay MC, Sabahi M, Azab M, Drexler R, Rotermund R, Ricklefs FL, Flitsch J, Smith TR, Kilgallon JL, Honegger J, Nasi-Kordhishti I, Gardner PA, Gersey ZC, Abdallah HM, Jane JA, Knappe UJ, Uksul N, Schroder HWS, Eördögh M, Losa M, Mortini P, Gerlach R, Antunes ACM, Couldwell WT, Budohoski KP, Rennert RC, Karsy M. The role of surgical management for prolactin-secreting tumors in the era of dopaminergic agonists: An international multicenter report. *Clin Neurol Neurosurg.* 2024 Jan;236:108079. doi: 10.1016/j.clineuro.2023.108079. Epub 2023 Dec 10. PMID: 38091700.

119. Arora H, Mammi M, Patel NM, Zyfi D, Dasari HR, Yunusa I, Simjian T, Smith TR, Mekary RA. Dexamethasone and overall survival and progression free survival in patients with newly diagnosed glioblastoma: a meta-analysis. *J Neurooncol.* 2024 Jan;166(1):17-26. doi: 10.1007/s11060-023-04549-3. Epub 2023 Dec 27. PMID: 38151699.



ADVANCED MULTIMODALITY IMAGE GUIDED OPERATING (AMIGO) SUITE

120. Aronne LJ, Sattar N, Horn DB, Bays HE, Wharton S, Lin WY, Ahmad NN, Zhang S, Liao R, Bunck MC, Jouravskaya I, Murphy MA; SURMOUNT-4 Investigators. Continued Treatment With Tirzepatide for Maintenance of Weight Reduction in Adults With Obesity: The SURMOUNT-4 Randomized Clinical Trial. *JAMA*. 2024 Jan 2;331(1):38-48. doi: 10.1001/jama.2023.24945. PMID: 38078870; PMCID: PMC10714284.
121. Smith TR, Koprivnikar J. Influences of compound age and identity in the effectiveness of insect quinone secretions against the fungus *Beauveria bassiana*. *Parasitol Res*. 2024 Feb 3;123(2):121. doi: 10.1007/s00436-024-08145-w. PMID: 38308145.
122. Gerstl JVE, Ehsan AN, Lassarén P, Yearley A, Raykar NP, Anderson GA, Smith TR, Sabapathy SR, Ranganathan K. The Global Macroeconomic Burden of Burn Injuries. *Plast Reconstr Surg*. 2024 Mar 1;153(3):743-752. doi: 10.1097/PRS.00000000000010595. Epub 2023 Apr 25. PMID: 37093034.
123. Sharifi G, Mohammadi E, Paraandavaji E, Tavangar SM, Dabbagh Ohadi MA, Jafari A, Jahanbakhshi A, Akbari Dilmaghani N, Davoudi Z, Smith TR, Banihashemi G, Azadi M, Hatami N, Zenonos GA, Mohajeri Tehrani M. Empty sella in somatotrophic pituitary adenomas; a series of 23 cases. *Front Surg*. 2024 Mar 4;11:1350032. doi: 10.3389/fsurg.2024.1350032. PMID: 38500594; PMCID: PMC10944865.
124. Smith TJ, Smith TR, Faruk F, Bendea M, Tirumala Kumara S, Capadona JR, Hernandez-Reynoso AG, Pancrazio JJ. Real-Time Assessment of Rodent Engagement Using ArUco Markers: A Scalable and Accessible Approach for Scoring Behavior in a Nose-Poking Go/No-Go Task. *eNeuro*. 2024 Mar 5;11(3):0500-23.2024. doi: 10.1523/ENEURO.0500-23.2024. PMID: 38351132; PMCID: PMC11046262.
125. Ohlsen SM, Metz AK, Froerer DL, Mortensen AJ, Smith TR, Featherall J, Rosenthal RM, Aoki SK. Relationship Between Hip Capsular Thickness and Instability After Previous Hip Arthroscopic Surgery: A Matched-Cohort Analysis. *Orthop J Sports Med*. 2024 Mar 5;12(3):23259671241231763. doi: 10.1177/23259671241231763. PMID: 38449694; PMCID: PMC10916485.
126. Gupta S, Hoffman SE, Mehta NH, Hauser B, Altshuler M, Bernstock JD, Smith TR, Arnaout O, Laws ER. Elevated risk of recurrence and retreatment for silent pituitary adenomas. *Pituitary*. 2024 Apr;27(2):204-212. doi: 10.1007/s11102-024-01382-3. Epub 2024 Feb 12. PMID: 38345720; PMCID: PMC11014773.
127. Bartholomew RA, Zhou H, Boreel M, Suresh K, Gupta S, Mitchell MB, Hong C, Lee SE, Smith TR, Guenette JP, Corrales CE, Jagadeesan J. Surgical Navigation in the Anterior Skull Base Using 3-Dimensional Endoscopy and Surface Reconstruction. *JAMA Otolaryngol Head Neck Surg*. 2024 Apr 1;150(4):318-326. doi: 10.1001/jamaoto.2024.0013. PMID: 38451508; PMCID: PMC11009826.
128. Tobochnik S, Regan MS, Dorotan MKC, Reich D, Lapinskas E, Hossain MA, Stopka S, Santagata S, Murphy MM, Arnaout O, Bi WL, Antonio Chiocca E, Golby AJ, Mooney MA, Smith TR, Ligon KL, Wen PY, Agar NYR, Lee JW. Pilot trial of perampanel on peritumoral hyperexcitability and clinical outcomes in newly diagnosed high-grade glioma. *medRxiv [Preprint]*. 2024 Apr 18:2024.04.11.24305666. doi: 10.1101/2024.04.11.24305666. PMID: 38645003; PMCID: PMC11030478.
129. Nawabi NLA, Kilgallon JL, McNulty JJ, Stopa BM, Gerstl JVE, Smith TR. Evaluating the Utility of Repeat Computed Tomography Scans in Patients with Isolated Mild Traumatic Subarachnoid Hemorrhage. *World Neurosurg*. 2024 May;185. doi: 10.1016/j.wneu.2024.02.100. Epub 2024 Feb 24. PMID: 38403015.
130. Sartain S, Wong C, Murray E, Raju SA, Woods A, Ashmore D, Dyall L, Kokwaro F, McGowan E, Leiberman D, Routledge E, Clarke E, Smith TR. Gastroenterology trainee experience, confidence and satisfaction in nutrition training: a cross-sectional survey in the UK. *Frontline Gastroenterol*. 2024 Jan 12;15(3):233-240. doi: 10.1136/flgastro-2023-102563. PMID: 38665797; PMCID: PMC11042450.
131. Mjåset C, Zwart JA, Goedmakers CMW, Smith TR, Solberg TK, Grotle M. Corrigendum to 'Criteria for success after surgery for cervical radiculopathy-estimates for a substantial amount of improvement in core outcome measures' by Christer Mjåset et al' [*The Spine Journal* 20/9 (2020) 1413-1421]. *Spine J*. 2024 Jun;24(6):1132. doi: 10.1016/j.spinee.2024.02.024. Epub 2024 Mar 21. Erratum for: *Spine J*. 2020 Sep;20(9):1413-1421. doi: 10.1016/j.spinee.2020.05.549. PMID: 38519335.
132. Chang C, Chavarro VS, Gerstl JVE, Blitz SE, Spanehl L, Dubinski D, Valdes PA, Tran LN, Gupta S, Esposito L, Mazzetti D, Gessler FA, Arnaout O, Smith TR, Friedman GK, Peruzzi P, Bernstock JD. Recurrent Glioblastoma-Molecular Underpinnings and Evolving Treatment Paradigms. *Int J Mol Sci*. 2024 Jun 19;25(12):6733. doi: 10.3390/ijms25126733. PMID: 38928445; PMCID: PMC11203521.
133. Bernstock JD, Gerstl JVE, Chen JA, Johnston BR, Nonnenbroich LF, Spanehl L, Gessler FA, Valdes PA, Lu Y, Srinivasan SS, Smith TR, Peruzzi P, Rolston JD, Stone S, Chiocca EA. The Case for Neurosurgical Intervention in Cancer Neuroscience. *Neurosurgery*. 2024 Jun 21. doi: 10.1227/neu.0000000000003039. Epub ahead of print. PMID: 38904388.
134. Nawabi NLA, Emedom-Nnamdi P, Kilgallon JL, Gerstl JVE, Cote DJ, Jha R, Ellen JG, Maniar KM, Hong CS, Dawood HY, Onnela JP, Smith TR. Assessing Mobility in Patients With Glioblastoma Using Digital Phenotyping-Piloting the Digital Assessment in Neuro-Oncology. *Neurosurgery*. 2024 Jun 24. doi: 10.1227/neu.0000000000003051. Epub ahead of print. PMID: 38912791.
135. Gerstl JVE, Gupta S, Stenberg CE, Chabros J, Nonnenbroich LF, Lindberg R, Altshuler MS, Seaver D, Mooney MA, Frerichs KU, Smith TR, Arnaout O. From Operating Room to Courtroom: Analyzing Malpractice Trajectories in Cranial Neurosurgery. *Neurosurgery*. 2024 Jun 25. doi: 10.1227/neu.0000000000003052. Epub ahead of print. PMID: 38916340.
136. Sarkar S, Corrales CE, Laws ER Jr, Smith TR. Intracellular Arachnoid Diverticulae as a Risk Factor for Intraoperative Cerebrospinal Fluid Leakage in Patients Undergoing Endoscopic Transsphenoidal Surgery. *Oper Neurosurg (Hagerstown)*. 2024 Aug 1;27(2):180-186. doi: 10.1227/ons.0000000000001079. Epub 2024 Feb 8. PMID: 38329346.
137. Omara C, Mammi M, Kvilhaug M, Soni S, Arora H, Yoo H, Smith TR, Mekary RA. Dural Venous Sinus Thrombosis After Vestibular Schwannoma Surgery: Should We Anticoagulate? *World Neurosurg*. 2024 Aug;188:220-229.e3. doi: 10.1016/j.wneu.2024.05.170. Epub 2024 Jun 4. PMID: 38838938.
138. Hong CS, Chabros J, Kilgallon JL, Gerstl JVE, Omara C, Drexler R, Flitsch J, Ricklefs FL, Ryba AS, Mazzatenta D, Guaraldi F, Corrales CE, Min L, Smith TR. A multicenter study of clinical outcomes and volumetric trends in suspected microprolactinomas. *Neurosurg Rev*. 2024 Sep 28;47(1):703. doi: 10.1007/s10143-024-02951-7. PMID: 39333461.
139. Panfil K, Smith TR, West L, Haas C, Kirkpatrick K. Abbreviated fixed-interval interventions promote self-control in rats. *Behav Processes*. 2024 Oct 10;222:105112. doi: 10.1016/j.beproc.2024.105112. Epub ahead of print. PMID: 39393449.
140. Amin NB, Frederich R, Tsamandouras N, Haggag AZ, Schuster T, Zmuda W, Palmer A, Vasas S, Buckley G, Smith TR, DuBrava SJ, Zhu Q, Johnson M. Evaluation of an oral small-molecule glucagon-like peptide-1 receptor agonist, lotiglipron, for type 2 diabetes and obesity: A dose-ranging, phase 2, randomized, placebo-controlled study. *Diabetes Obes Metab*. 2024 Oct 16. doi: 10.1111/dom.16005. Epub ahead of print. PMID: 39415344.
141. Sagberg LM, Salvesen Ø, Jakola AS, Thurin E, De Dios E, Nawabi NLA, Kilgallon JL, Bernstock JD, Kavouridis VK, Smith TR, Solheim O. Progression-free survival versus post-progression survival and overall survival in WHO grade 2 gliomas. *Acta Oncol*. 2024 Oct 20;63:798-804. doi: 10.2340/1651-226X.2024.40845. PMID: 39428639; PMCID: PMC11500610.
142. Gerritsen JKW, Mekary RA, Pisciă D, Zwarthoed RH, Kilgallon JL, Nawabi NL, Jessurun CAC, Versyck G, Moussa A, Bouhaddou H, Pruijn KP, Fisher FL, Larivière E, Solie L, Kloet A, Tewarie RN, Schouten JW, Bos EM, Dirven CMF, Jacques van den Bent M, Chang SM, Smith TR, Broekman MLD, Vincent AJPE, De Vleeschouwer PS. Onco-functional outcome after resection for eloquent glioblastoma (OFO): A propensity-score matched analysis of an international, multicentre, cohort study. *Eur J Cancer*. 2024 Nov;212:114311. doi: 10.1016/j.ejca.2024.114311. Epub 2024 Sep 18. PMID: 39305740.
143. Mehta NH, Patel RV, Gupta S, Arora H, Nawabi NL, Karanth R, Sadler S, Medeiros L, Jha R, Chavarro VS, Bernstock JD, Smith TR, Arnaout O. Cerebellopontine Angle Meningiomas: A Multi-Institutional Cohort Study. *Neurosurgery*. 2024 Nov 1. doi: 10.1227/neu.0000000000003258. Epub ahead of print. PMID: 39485023.
144. Tobochnik S, Regan MS, Dorotan MKC, Reich D, Lapinskas E, Hossain MA, Stopka S, Meredith DM, Santagata S, Murphy MM, Arnaout O, Bi WL, Chiocca EA, Golby AJ, Mooney MA, Smith TR, Ligon KL, Wen PY, Agar NYR, Lee JW. Pilot Trial of Perampanel on Peritumoral Hyperexcitability in Newly Diagnosed High-grade Glioma. *Clin Cancer Res*. 2024 Nov 5. doi: 10.1158/1078-0432.CCR-24-1849. Epub ahead of print. PMID: 39499201.
145. Patel A, Rosenke K, Parzych EM, Feldmann F, Bharti S, Griffin AJ, Schouest B, Lewis M, Choi J, Chokkalingam N, Machado V, Smith BJ, Frase D, Ali AR, Lovaglio J, Nguyen B, Hanley PW, Walker SN, Gary EN, Kulkarni A, Generotti A, Francica JR, Rosenthal K, Kulp DW, Esser MT, Smith TRF, Shaia C, Weiner DB, Feldmann H. In vivo delivery of engineered synthetic DNA-encoded SARS-CoV-2 monoclonal antibodies for pre-exposure prophylaxis in non-human primates. *Emerg Microbes Infect*. 2024 Dec;13(1):2294860. doi: 10.1080/22221751.2023.2294860. Epub 2024 Feb 28. PMID: 38165394; PMCID: PMC10903752.



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FELLOWSHIP

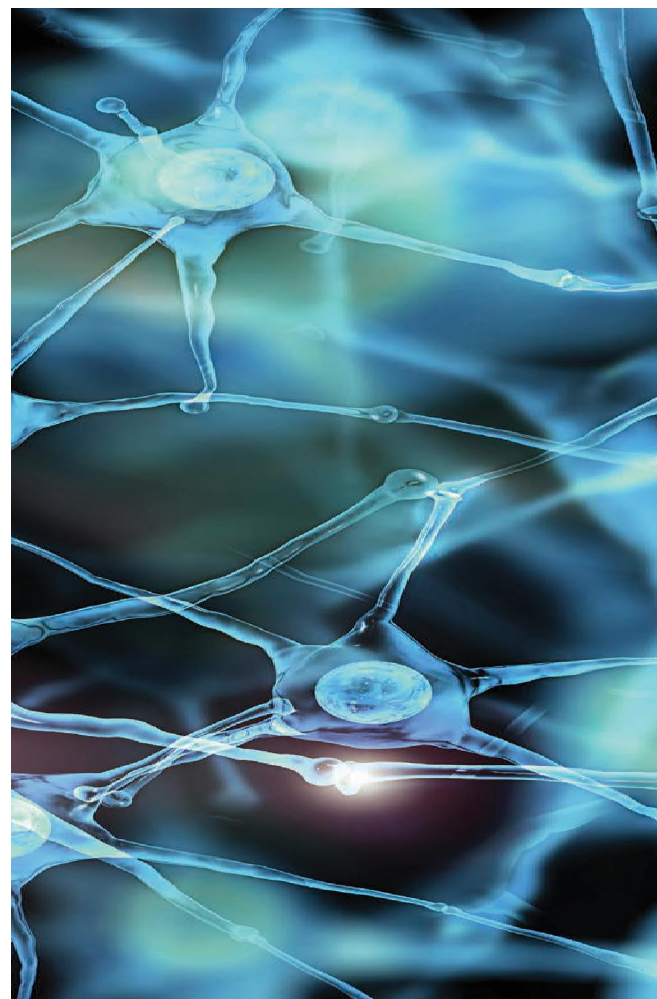
Enfolded Pediatric Spinal Deformity
Fellowship, Shriners' Hospital for Children,
2016

CLINICAL INTERESTS

Artificial Disc Replacement, Cervical Radiculopathy,
Cervical Stenosis, Chiari Malformation, Claudication,
Degenerative Disc Disease, Disc Herniation, Image-
Guided Surgery, Lumbar Radiculopathy, Lumbar
Stenosis, Minimally Invasive Surgery, Myelopathy,
Scoliosis, Spinal Cord Injury, Spinal Cord Tumors,
Spinal Deformity, Spinal Fracture, Reconstruction,
Spinal Fusion, Spondylolisthesis, Traumatic Brain
Injury

PUBLICATIONS

1. Jada A, Mackel CE, Hwang SW, Samdani AF, Stephen JH, Bennett JT, Baaj AA. Evaluation and management of adolescent idiopathic scoliosis: a review. *Neurosurg Focus* 2017 Oct; 43(4):E2
2. Mackel CE, Jada A, Samdani AF, Stephen JH, Bennett JT, Baaj AA, Hwang SW. A comprehensive review of the diagnosis and management of congenital scoliosis. *Childs Nerv Syst*. 2018 Nov;34(11):2155-2171.
3. Stephen JH, Hoffman E, Narayanan U, Sponseller PD, Samdani AF. "Health Related Quality of Life in Neuromuscular Scoliosis" *Neuromuscular Spine Deformity*, 1st Ed. New York, Stuttgart, Thieme, 2018. 173-178.
4. Stephen JH, Lee JYK. "Endoscopic Transoral approach to Craniocervical Junction." *Endoscopic Spine Surgery*, 2nd Ed. New York, Stuttgart, Thieme, 2018. 291-294.



HASAN AQDAS ZAIDI, MD

DIRECTOR SPINE RESEARCH,
COMPUTATIONAL NEUROSURGICAL
OUTCOMES CENTER, BRIGHAM AND
WOMEN'S HOSPITAL, HARVARD
MEDICAL SCHOOL

CO-DIRECTOR, ADULT SPINAL
DEFORMITY AND SCOLIOSIS PROGRAM

ACADEMIC TITLES

Assistant Professor, Harvard Medical School

MEDICAL SCHOOL

Johns Hopkins University School of
Medicine, Baltimore, MD, 2010

RESIDENCY

Barrow Neurological
Institute, Neurological
Surgery, 2017

FELLOWSHIPS

Johns Hopkins Hospital,
Baltimore Neuro-oncology, 2009

Barrow Neurological Institute,
Complex Spine/Adult Spinal Deformity, 2015

Brigham and Women's Hospital,
Pituitary/Neuroendoscopic Surgery,
2016

CERTIFICATIONS

Neurosurgery, 2017

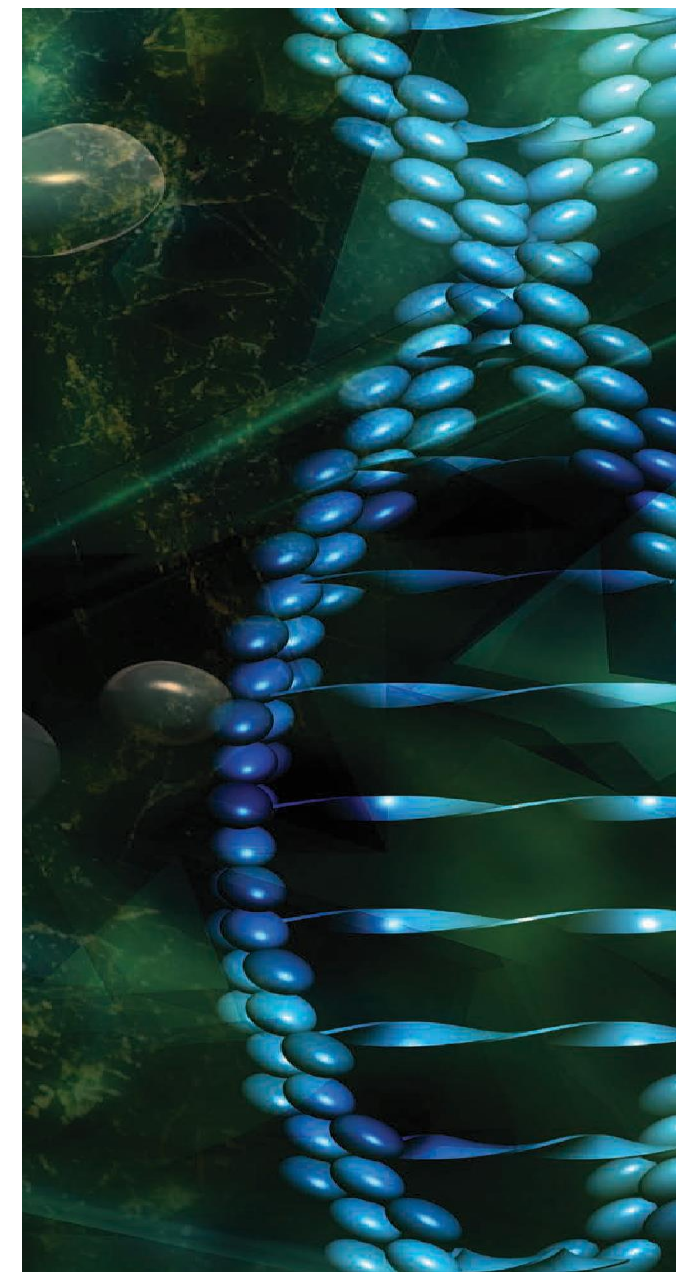
CLINICAL INTERESTS

Arthroplasty, Artificial Disc Replacement, Cervical
Radiculopathy, Cervical Stenosis, Chordoma,
Degenerative Disc Disease, Disc Herniation,
Endoscopic Neurosurgery, Image-Guided Surgery,
Lumbar Radiculopathy, Lumbar Stenosis, Minimally
Invasive Surgery, Muscle Sparing Spine Surgery,
Myelopathy, Neurological Oncology, Pain
Management, Pituitary Tumors, Scoliosis, Slipped
Disc, Spinal Cord Injury, Spinal Cord Tumors Spinal
Deformity, Spinal Disorders, Spinal Fractures
Reconstruction, Spinal Fusion, Spine Tumors,
Spondylolisthesis, Tethered Cord, Transnasal
Endoscopic Pituitary Surgery

PUBLICATIONS

1. Lak AM, Rahimi A, Abunimer AM, Tafel I, Devi S, Premkumar A, Ida F, Lu Y, Chi JH, Tanguturi S, Groff MW, Zaidi HA. Quantifying the impact of surgical decompression on quality of life and identification of factors associated with outcomeAs in patients with symptomatic metastatic spinal cord compression. *Journal of Neurosurgery—Spine*. 2020 Apr 3:1-8. PMID: 32244218.
2. Lak A, Tafel IA, Rahimi A, Zaidi HA. Outcomes of Minimally Invasive versus Open surgery for Intermediate to High Grade Spondylolisthesis Correction: a 10 year retrospective, Multicenter experience. *Spine*. 2020 Oct 15: 15;45(20):1451-1458. PMID: 32453240.
6. Boaro A, Lu Y, Chi JH, Groff MW, Smith TR, Zaidi HA. A National Surgical Quality Improvement Program (NSQIP) analysis of postoperative major and minor complications in patients with spinal metastatic disease. *World Neurosurgery*. 2020 Aug;140:e203-e211. PMID: 32389869.
7. Lak A, Smith TR, Makhni M, Aglio LS, Goedmakers CM, Zaidi HA. Single versus Dual Attending Surgeon Approach for Spine Deformity: A systematic Review and Meta-Analysis. *Operative Neurosurgery*. 2020 Dec 29. PMID: 33372960.
8. Yeung CM, Lightsey HM, Isaac S, Issac Z, Gilligan CJ, Zaidi H, Ludwig SC, Kang JD, Makhni MC. Improving Spine Models of Care. *JBJS Review*. 2021 April; 9(4):e. PMID: 33982981.
9. Gupta SA, Zaki M, Khawaja A, Lu YL, Groff M, Chi JC, Zaidi HA. Adult Sport-related Traumatic Spinal Injuries: Do Different Activities Predispose to Certain Injuries? Congress of Neurological Surgeons Annual Meeting. *Journal of Neurosurgery: Spine*. In-press. 2021 Aug 24:1-7. PMID: 35354117
10. Goedmakers C, Lak A, Duetz A, Senko A, Arnaout O, Groff M, Smith T, Vleggeert-Lankamp C, Zaidi H, Rana A, Boaro A. Deep Learning for Adjacent Segment Disease on Preoperative MRI for Cervical Radiculopathy. *Radiology*. 2021 Sep 21. PMID: 34546126.
11. Hauser BM, McNulty J, Zaki MM, Gupta S, Cote DJ, Bernstock JD, Lu Y, Chi JH, Groff MW, Khawaja AM, Smith TR, Zaidi HA. Predictors of thoracic and lumbar spine injuries in patients with TBI: A nationwide analysis. *Injury*. 2021 Oct 2. PMID 34625238.

12. Hauser BM, Hoffman SE, Gupta S, Zaki MM, Xu E, Chua M, Bernstock JD, Khawaja A, Smith TR, Proctor MR, Zaidi HA. Association of venous thromboembolism following pediatric traumatic spinal injuries with injury severity and longer hospital stays. *Journal of Neurosurgery—Spine*. 2021 Sep. PMID: 34534962
13. Hoffman SE, Hauser BM, Zaki MM, Gupta S, Chua M, Bernstock JD, Khawaja AM, Smith TR, Zaidi HA. Spinal level and cord involvement in the prediction of sepsis development after vertebral fracture repair for traumatic spinal injury. *J Neurosurg Spine*. 2022 Feb 04; 1-7. PMID: 35120317; PMCID: PMC9349473.
14. Iyer S, Bovonratwet P, Samartzis D, Schoenfeld AJ, An HS, Awwad W, Blumenthal SL, Cheung JPY, Derman PB, El-Sharkawi M, Freedman BA, Hartl R, Kang JD, Kim HJ, Louie PK, Ludwig SC, Neva MH, Pham MH, Phillips FM, Qureshi SA, Radcliff KE, Riew KD, Sandhu HS, Sciubba DM, Sethi RK, Valacco M, Zaidi HA, Zygorakis CC, Makhni MC. Appropriate Telemedicine Utilization in Spine Surgery: Results From a Delphi Study. *Spine (Phila Pa 1976)*. 2022 Apr 15;47(8):583-590. PMID: 35125460.
15. Yearly A, Chaliff J, Chaliff EJ, Zaidi HA. The relationship between surgeon experience, complications, and radiographic outcomes in spine deformity surgery: the experience of a junior surgeon. *World Neurosurgery*. 2022 Dec;168:e399-e407. PMID: 36307035.
16. Abunimer A, Hammoudeh L, Dee E, Lak A, Chi J, Lu Yi, Groff M, Shin J, Lam Miranda, Zaidi H. Gross Total Resection of Spinal Chondrosarcoma is Associated with Improved Locoregional Relapse-Free Survival and Overall Survival. *Eur Spine J*. 2023 Jan 2. PMID: 36592209.
17. Martin E, Muskens IS, Senders JT, DiRisio AC, Karhade AV, Zaidi HA, Moojen WA, Peul WC, Smith TR, Broekman MLD. Randomized controlled trials comparing surgery to non-operative management in neurosurgery: a systematic review. *Acta Neurochir (Wien)*. 2019 Apr;161(4):627-634. PMID: 30798479.
18. Fidelia I, Lamba N, Papatheodorou SI, Yunusa I, O'Neil K, Chun S, Wilson J, Maher T, Tafel I, Smith TR, Aglio LS, Mekary RA, Zaidi HA. Adult spinal deformity surgery: a systematic review of venous thromboprophylaxis and incidence of venous thromboembolic events. *Neurosurg Rev*. 2019 Mar 18. PMID: 30887142.
19. Karhade AV, Senders JT, Martin E, Muskens IS, Zaidi HA, Broekman MLD, Smith TR. Trends in High-Impact Neurosurgical Randomized Controlled Trials Published in General Medical Journals: A Systematic Review. *World Neurosurg*. 2019 May 17. PMID: 31108256.
20. Smith C, Lamba N, Ou Z, Vo QA, Araujo-Lama L, Lim S, Joshi D, Doucette J, Papatheodorou S, Tafel I, Aglio LS, Smith TR, Mekary RA, Zaidi H. The prevalence of complications associated with lumbar and thoracic spinal deformity surgery in the elderly population: a meta-analysis. *J Spine Surg*. 2019 Jun;5(2):223-235. PMID: 31380476.
21. Fidelia I, Lamba N, Papatheodorou SI, Yunusa I, O'Neil K, Chun S, Wilson J, Maher T, Tafel I, Smith TR, Aglio LS, Mekary RA, Zaidi HA. The Safety and Efficacy of Tranexamic Acid (TXA) in Adult Spinal Deformity Surgery A Systematic Review and Meta-Analysis. *Drugs* Oct 2019 79 (15), 1679-1688. PMID: 31432435.
22. Sultan I, Lamba N, Liew A, Doung P, Tewarie I, Amamoo JJ, Gannu L, Chawla S, Doucette J, Cercedo-Lopez CD, Papatheodorou S, Tafel I, Aglio LS, Smith TR, Zaidi H, Mekary RA. The safety and efficacy of steroid treatment for acute spinal cord injury: a systematic review and meta-analysis. *Heliyon*. Feb 2020. PMID: 32095652.
23. Minimally invasive versus open surgery for the correction of adult degenerative scoliosis: a systematic review. Lak AM, Lamba N, Pompilus F, Yunusa I, King A, Sultan I, Amamoo J, Al-Otaibi NM, Alasmari M, Zaghoul I, Aglio L, Cercedo-Lopez CD, Tafel I, Smith TR, Mekary RA, Zaidi H. *Neurosurgery Review*. Mar 2020. PMID: 32166508.
24. Reduction versus in-situ fusion for Adult High-Grade Spondylolisthesis: A systematic Review and Meta-analysis. Lak AM, Abunimer AM, Devi S, Chawla S, Aydin L, Tafel I, Smith TR, Mekary RA, Zaidi HA. *World Neurosurgery*. Mar 2020 13:S1878-8750(20)30498-8. PMID 32179186.
25. Lak AM, Zaidi HA. Commentary: Minimally Invasive Posterior Cervical Foraminotomy Using 3-Dimensional Total Navigation: 2-Dimensional Operative Video. *Operative Neurosurgery*. 2020 Dec 8. PMID: 33294921.
26. Massaad E, Hadzipasic M, Kiapour A, Lak AM, Shankar G, Zaidi HA, Hershman SH, Shin J. Association of spinal alignment correction with patient reported outcomes in adult cervical deformity: review of the literature. *Neurospine*. 2021 May 18. PMID: 34015894.
27. Calvachi P, McAvoy MD, Cercedo-Lopez CD, Lu Y, Chi JH, Aglio LS, Smith TR, Gormley WB, Groff MW, Mekary RA, Zaidi HA. Expandable versus Static Cages in Minimally Invasive Lumbar Interbody fusion: A systematic Review and Meta-Analysis. *World Neurosurgery*. 2021 Apr 30. PMID: 33940268
28. Zaidi HA, Chaliff J. Anterior Cervical Corpectomy. *Handbook of Spine Surgery* (eds. A. Baaj). New York, NY: Theime (in-press). Mustroph M, Cercedo-Lopez C, Groff M, Zaidi HA. Bilateral Synovial Cysts as a Rare Cause of Myelopathy in a 38-year-old woman. *Cureus*. 2019 Aug 13;11(8):e5377 PMID: 31616609.
29. Lak A, Zaidi HA, Arnaout OA. Unexpected Resolution of a Symptomatic Tarlov Cyst Following Hysterectomy. *Journal of American Medical Association – Neurology*. Aug 2020;77(8):1032-1033. PMID: 32421153.
30. Lak A, Segar D, Abunimer A, Zaidi HA. Partially Cystic Lumbar Schwannoma with Atypical Histopathological Features. *World Neurosurgery*. Jun 2020;138:440-443. PMID: 32251817
31. Jha R, Chalif JI, Yearley AG, Chalif E, Zaidi HA. Defining the Post-Operative Progression of Degenerative Scoliosis: An Analysis of Cases without Instrument Failure. *J Clin Neurosci*. 2024 Feb;120:107-114. doi: 10.1016/j.jocn.2024.01.013. Epub 2024 Jan 18. PMID: 38237488.
32. Mammi M, Wat R, Paredes J, Smith TR, Gormley WB, Zaidi H, Mekary RA. In Reply to the Letter to the Editor Regarding "The effectiveness of antiepileptic medications as prophylaxis of early seizure in patients with traumatic brain injury compared with Placebo or no treatment: a systematic review and meta-analysis". *World Neurosurgery* 2019 Nov;131:207. PMID: 31658672.
33. Lak A, Zaidi HA, Smith TR. Commentary: Cottonoid Sliders: A Simple and Cost-effective tool for Retractorless Intracranial Surgery. *Operative Neurosurgery*. 2020 Sep 15;19(4):E432-433. PMID: 32396188.
34. Massaad E, Mitchell TS, Duerr E, Kiapour A, Cha TD, Coumans JC, Groff MW, Hershman SH, Kang JD, Lipa SA, Small L, Tobert DG, Schoenfeld AJ, Shankar GM, Zaidi HA, Shin JH, Williamson T. Disparities in Surgical Intervention and Health-Related Quality of Life Among Racial/Ethnic Groups With Degenerative Lumbar Spondylolisthesis. *Neurosurgery*. 2024 Sep 1;95(3):576-583. doi: 10.1227/neu.0000000000002925. Epub 2024 Apr 18. PMID: 39145650.
35. Bhagirath P, Campos FO, Zaidi HA, Chen Z, Elliott M, Gould J, Kemme MJB, Wilde AAM, Götte MJW, Postema PG, Prassl AJ, Neic A, Plank G, Rinaldi CA, Bishop MJ. Predicting postinfarct ventricular tachycardia by integrating cardiac MRI and advanced computational reentrant pathway analysis. *Heart Rhythm*. 2024 Oct;21(10):1962-1969. doi: 10.1016/j.hrthm.2024.04.077. Epub 2024 Apr 24. PMID: 38670247.



BOSTON CHILDREN'S HOSPITAL NEUROSURGICAL RESEARCH

OVERVIEW

Laboratory research in the Neurosurgery Department focuses on the basic mechanisms of common neurosurgical conditions such as trauma to the brain and spinal cord, the genetic make-up of brain tumors, and the dynamics of brain and cerebrospinal fluid pulsation. The researchers are investigating the utility of measuring certain enzymatic compounds as markers of tumor growth and recurrence, as well as of cerebral ischemia. They are also exploring the role of temporarily-implanted cortical electrodes in the study of memory and learning paradigms.

RESEARCHERS

Katie Fehnel, MD

FOCUS: Brain Tumors

Joseph Madsen, MD

FOCUS: Epilepsy

Mark Proctor, MD

FOCUS: Improvement of longterm outcomes in neurotrauma, Craniostyostosis

AREAS OF CURRENT RESEARCH

- The role of novel growth factors in optic nerve regeneration, stroke, and spinal cord injury;
- Inosine and cell-signaling pathways in the CNS;
- Finite element analysis description of the changes in brain and ventricular system during the cardiac cycle;
- Detailed genetic analysis of malignant and non-malignant brain tumors in children;
- The role of matrix metalloproteinases in the detection of recurrence of pediatric brain tumors;
- Advance precision medicine for brain disorders using genome-edited human stem cells.

Alfred Pokemeng See, MD

FOCUS: Venous malformations

Edward R. Smith, MD

FOCUS: Moyamoya syndrome, Brain tumors

Scellig Stone, MD, PhD

FOCUS: Pediatric Movement Disorders

Xin Tang, PhD

FOCUS: Pathology of brain disorders, molecular mechanism-guided therapeutics

Benjamin C. Warf, MD

FOCUS: Hydrocephalus





LISSA BAIRD, MD

DIRECTOR OF NEUROSURGICAL ONCOLOGY

ACADEMIC TITLE

Associate Professor, Harvard Medical School

MEDICAL SCHOOL

Columbia University,
College of Physicians and Surgeons, 2004

INTERNSHIP

UCSD Medical Center, 2005

RESIDENCY

UCSD Medical Center, 2011

FELLOWSHIP

LSU Health Sciences Center-
Shreveport, Skull Base, 2010

Boston Children's Hospital, Harvard Medical
School, Pediatric Neurosurgery, 2012

CLINICAL INTERESTS

Brain Tumors, Hydrocephalus, Tethered Spinal
Cord, Chiari Malformation, Vascular
Malformations

PUBLICATIONS

1. Dietz MS, Beach CZ, Barajas R, Parappilly MS, Sengupta SK, Baird LC, Ciporen JN, Han SJ, Loret de Mola R, Cho YJ, Nazemi KJ, McClelland S 3rd, Wong MH, Jaboin JJ. Measure Twice: Promise of Liquid Biopsy in Pediatric High-Grade Gliomas. *Adv Radiat Oncol.* 2020 Jan 28;5(2):152-162. doi: 10.1016/j.adro.2019.12.008. PMID: 32280814; PMCID: PMC7136635.
2. Bauer DF, Baird LC, Klimo P, Mazzola CA, Nikas DC, Tamber MS, Flannery AM. Congress of Neurological Surgeons Systematic Review and Evidence-Based Guidelines on the Treatment of Pediatric Hydrocephalus: Update of the 2014 Guidelines. *Neurosurgery.* 2020 Nov 16;87(6):1071-1075. doi: 10.1093/neuros/nyaa434. PMID: 34791462.
3. Fouda MA, Day EL, Staffa SJ, Scott RM, Marcus KJ, Baird LC. Postoperative MR imaging surveillance of pediatric craniopharyngioma: new institutional guidelines. *Childs Nerv Syst.* 2021 Mar;37(3):853-861. doi: 10.1007/s00381-020-04901-2. Epub 2020 Oct 3. PMID: 33011870.
4. Fouda MA, Karsten M, Staffa SJ, Scott RM, Marcus KJ, Baird LC. Management strategies for recurrent pediatric craniopharyngioma: new recommendations. *J Neurosurg Pediatr.* 2021 Mar 5;27(5):548-555. doi: 10.3171/2020.9.PEDS20606. PMID: 33668031.
5. Bauer DF, Baird LC, Flannery AM, Klimo P, Tamber MS, Nikas DC, Mazzola CA, Rehring P. In Reply: Congress of Neurological Surgeons Systematic Review and Evidence-Based Guidelines on the Treatment of Pediatric Hydrocephalus: Update of the 2014 Guidelines. *Neurosurgery.* 2021 Jun 15;89(1). doi: 10.1093/neuros/nyab098. PMID: 33822192.
6. Slingerland AL, Baird LC, Scott RM. Optic nerve compression in craniopharyngioma by taut anterior cerebral arteries visualized in frontal and transsphenoidal exposures: illustrative cases. *J Neurosurg Case Lessons.* 2022 Jan 17;3(3). doi: 10.3171/CASE21642. PMID: 36130574; PMCID: PMC9379650.
7. Sadler B, Skidmore A, Gewirtz J, Anderson RCE, Haller G, Ackerman LL, Adelson PD, Ahmed R, Albert GW, Aldana PR, Alden TD, Averill C, Baird LC, Bauer DF, Bethel-Anderson T, Bierbrauer KS, Bonfield CM, Brockmeyer DL, Chern JJ, Couture DE, Daniels DJ, Dlouhy BJ, Durham SR, Ellenbogen RG, Eskandari R, Fuchs HE, George TM, Grant GA, Graupman PC, Greene S, Greenfield JP, Gross NL, Guillaume DJ, Hankinson TC, Heuer GG, Iantosca M, Iskandar BJ, Jackson EM, Jea AH, Johnston JM, Keating RF, Khan N, Krieger MD, Leonard JR, Maher CO, Mangano FT, Mapstone TB, McComb JG, McEvoy SD, Meehan T, Menezes AH, Muhlbauer M, Oakes WJ, Olavarria G, O'Neill BR, Ragheb J, Selden NR, Shah MN, Shannon CN, Smith J, Smyth MD, Stone SSD, Tuite GF, Wait SD, Wellons JC, Whitehead WE, Park TS, Limbrick DD, Strahle JM. Extradural decompression versus duraplasty in Chiari malformation type I with syrinx: outcomes on scoliosis from the Park-Reeves Syringomyelia Research Consortium. *J Neurosurg Pediatr.* 2021 Jun 18;28(2):167-175. doi: 10.3171/2020.12.PEDS20552. PMID: 34144521.
8. Akbari SHA, Rizvi AA, CreveCoeur TS, Han RH, Greenberg JK, Torner J, Brockmeyer DL, Wellons JC, Leonard JR, Mangano FT, Johnston JM, Shah MN, Iskandar BJ, Ahmed R, Tuite GF, Kaufman BA, Daniels DJ, Jackson EM, Grant GA, Powers AK, Couture DE, Adelson PD, Alden TD, Aldana PR, Anderson RCE, Selden NR, Bierbrauer K, Boydston W, Chern JJ, Whitehead WE, Dauser RC, Ellenbogen RG, Ojemann JG, Fuchs HE, Guillaume DJ, Hankinson TC, O'Neill BR, Iantosca M, Oakes WJ, Keating RF, Klimo P, Muhlbauer MS, McComb JG, Menezes AH, Khan NR, Niazi TN, Ragheb J, Shannon CN, Smith JL, Ackerman LL, Jea AH, Maher CO, Narayan P, Albert GW, Stone SSD, Baird LC, Gross NL, Durham SR, Greene S, McKinstry RC, Shimony JS, Strahle JM, Smyth MD, Dacey RG, Park TS, Limbrick DD. Socioeconomic and demographic factors in the diagnosis and treatment of Chiari malformation type I and syringomyelia. *J Neurosurg Pediatr.* 2021 Dec 3;29(3):288-297. doi: 10.3171/2021.9.PEDS2185. PMID: 34861643.
9. Yearley AG, Blitz SE, Patel RV, Chan A, Baird LC, Friedman GK, Arnaout O, Smith TR, Bernstock JD. Machine Learning in the Classification of Pediatric Posterior Fossa Tumors: A Systematic Review. *Cancers (Basel).* 2022 Nov 15;14(22):5608. doi: 10.3390/cancers14225608. PMID: 36428701; PMCID: PMC9688156.
10. Longacre MM, Seshadri SC, Adil E, Baird LC, Goobie SM. Perioperative management of pediatric patients undergoing juvenile angiofibroma resection. A case series and educational review highlighting patient blood management. *Paediatr Anaesth.* 2023 Jul;33(7):510-519. doi: 10.1111/pan.14655. Epub 2023 Mar 21. PMID: 36869694.
11. Warf BC, Weber DS, Day EL, Riordan CP, Staffa SJ, Baird LC, Fehnel KP, Stone SSD. Endoscopic third ventriculostomy with choroid plexus cauterization: predictors of long-term success and comparison with shunt placement for primary treatment of infant hydrocephalus. *J Neurosurg Pediatr.* 2023 May 12;32(2):201-213. doi: 10.3171/2023.4.PEDS2310. PMID: 37178026.
12. Baird LC. AI rapidly diagnoses brain tumours during surgery. *Nature.* 2023 Oct;622(7984):702-703. doi: 10.1038/d41586-023-03072-9. PMID: 37848711.
13. Gestrich C, Grieco K, Lidov HG, Baird LC, Fehnel KP, Yeo KK, Meredith DM, Alexandrescu S. H3K27-altered diffuse midline gliomas with MAPK pathway alterations: Prognostic and therapeutic implications. *J Neuropathol Exp Neurol.* 2023 Dec 22;83(1):30-35. doi: 10.1093/jnen/nlad103. PMID: 38037182.





KATIE PRICOLA FEHNEL, MD

DIRECTOR, SPINAL CORD TUMOR PROGRAM

ACADEMIC TITLE

Assistant Professor, Harvard Medical School

MEDICAL SCHOOL

Stanford University, 2010

INTERNSHIP

Massachusetts General Hospital, 2011

RESIDENCY

Massachusetts General Hospital, 2017

FELLOWSHIP

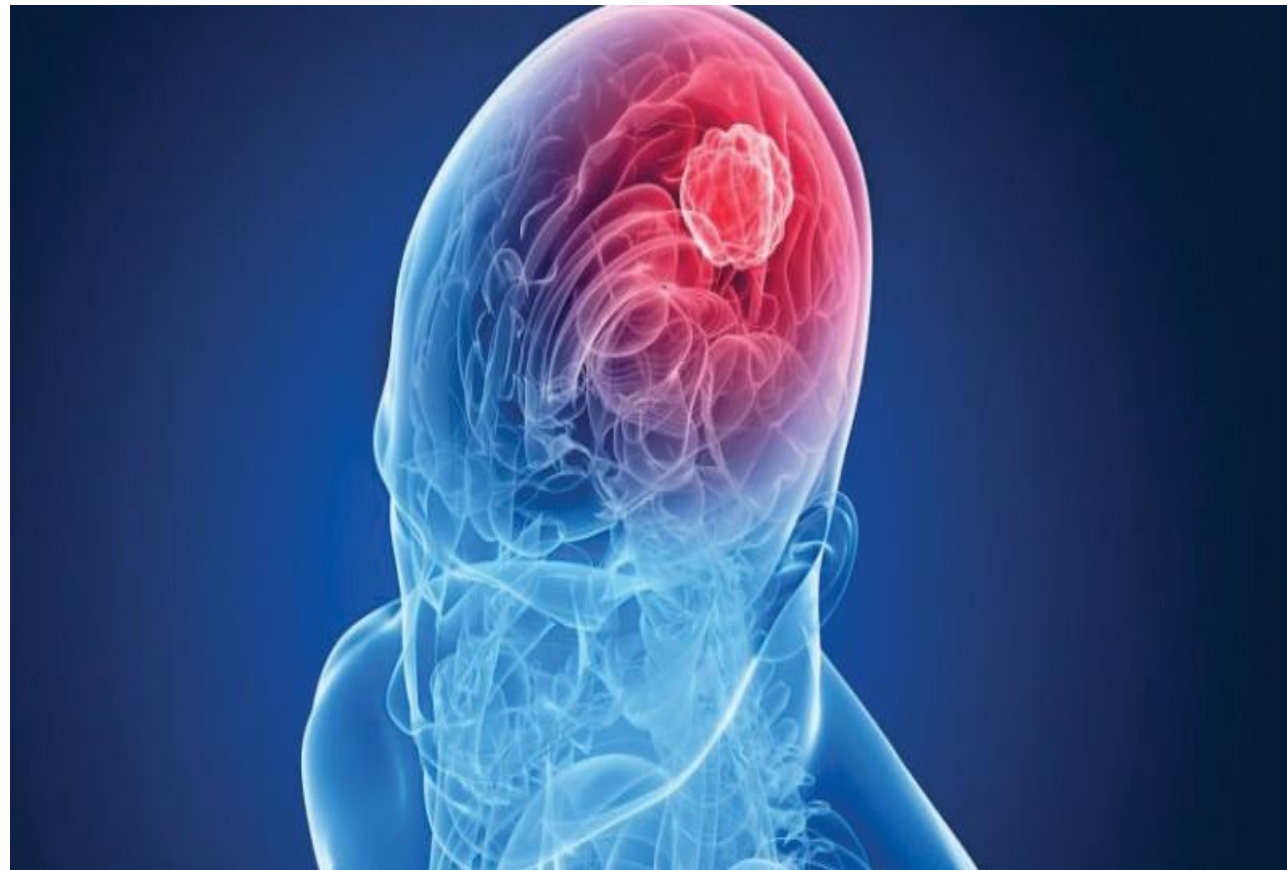
Boston Children's Hospital, 2018

CLINICAL INTERESTS

Brain Tumors, Chiari Malformation, Hydrocephalus, Spinal Cord Injury, Spine problems, Tethered Spinal Cord, Vascular Malformations, Hemangioma

PUBLICATIONS

1. Rolle M, Fehnel KP. Low threshold for intracranial imaging in fever of unknown origin associated with cyanotic heart disease in the pediatric population [published online ahead of print, 2020 Jun 6]. *Childs Nerv Syst.* 2020;10.1007/s00381-020-04696-2. doi:10.1007/s00381-020-04696-2
2. Touat M, Li YY, Boynton AN, [...] Fehnel KP [...] et al. Mechanisms and therapeutic implications of hypermutation in gliomas. *Nature.* 2020;580(7804):517-523. doi:10.1038/s41586-020-2209-9 April 15, 2020
3. Tsetsou S, Butler W, Borges L [...] Fehnel KP [...] Dynamic mapping of the corticospinal tract in open cordotomy and myelomeningocele surgery. *J Clin Neurosci.* 2020;74:225-231. doi:10.1016/j.jocn.2020.01.054
4. Bernstock, JD; Tafel, I; Segar, DJ; ... Aglan, O; Montaser, A; Gupta, S; Johnston, B; Judge, J; Fehnel, K; Stone, S.S; Warf, B.C. Complex Management of Hydrocephalus Secondary To Choroid Plexus Hyperplasia, *World Neurosurgery*, 2020, ISSN 1878-8750.
5. Fehnel KP, McClain CD, Smith ER: Indirect bypass for maternal symptomatic moyamoya in the first trimester of pregnancy: case report. *J Neurosurg Pediatr*:1-6, 2019 <https://doi.org/10.1016/j.wneu.2020.05.211>
9. Koch MJ, Mahal BAV, Hadzipasic M, Fehnel KP, Chapman PH, Loeffler JS, Orbach D.B., Smith ER: Dynamic Changes in Arteriovenous Malformations (AVMs): Spontaneous Growth and Resolution of AVM-Associated Aneurysms in Two Pediatric Patients. *Pediatr Neurosurg* 54:394-398, Oct. 2019
10. Fehnel KP, Penn DL, Duggins-Warf M [...] Smith ER. Dysregulation of the EphrinB2-EphB4 ratio in pediatric cerebral arteriovenous malformations is associated with endothelial cell dysfunction in vitro and functions as a novel noninvasive biomarker in patients. *Exp Mol Med.* 2020;52(4):658-671. doi:10.1038/s12276-020-0414-0
11. Fehnel KP, Proctor MR. Spinal Cord Injuries in Children. Kliegman, St Geme, Blum, Shah, Tasker and Wilson (Ed.), *Nelson Textbook of Pediatrics*, 22nd Ed., Elsevier Publishing. In press, 2021.
9. Day EL, Smith ER, Fehnel KP. Single-institution case series of pituitary biopsy for suspected germinoma in the pediatric population: diagnostic utility, operative risks, and biopsy approaches. *Sci Rep.* 2020 Sep 17;10(1):15257. doi: 10.1038/s41598-020-71988-7. PMID: 32943645.
10. Hadzipasic M, Karsten MB, Olson H, Rodan L, Lidov H, Prabhu SP, Wright K, Fehnel KP. Medulloblastoma in the setting of megalencephaly polymicrogyria polydactyly hydrocephalus. *Am J Med Genet A.* 2021 May;185(5):1614- 1618. doi: 10.1002/ajmg.a.62125. Epub 2021 Feb 25. PMID: 33634562.
11. Fouda MA, Day EL, Zurakowski D, Scott RM, Smith ER, Marcus KJ, Fehnel KP. Predictors of progression in radiation-induced versus nonradiation-induced pediatric meningiomas: a large single-institution surgical experience. *J Neurosurg Pediatr.* 2021 Jun 11:1-7. doi: 10.3171/2021.1.PEDS20819. Epub ahead of print. PMID: 34116509
16. Sesen J, Driscoll J, Shah N, Moses-Gardner A, Luiselli G, Alexandrescu S, Zurakowski D, Baxter PA, Su JM, Pricola Fehnel K, Smith ER. Neogenin is highly expressed in diffuse intrinsic pontine glioma and influences tumor invasion. *Brain Res.* 2021 Jul. PMID: 33571520
17. Blandin AF, Giglio R, Graham MS, Garcia G, Malinowski S, Woods JK, Rankissoon S, Rankissoon L, Duboi F, Schoolcraft K, Tsai J, Wang D, Jones R, Vogelzang J, Pelton K, Becker S, Watkinson F, Sinai C, Cohen EF, Booker MA, Tolstorukov MY, Haemels V, Goumnerova L, Wright K, Kieran M, Fehnel K, Reardon D, Tauziède-Espariat A, Lulla R, Carcamo B, Chaleff S, Charest A, D Smet F, Ligon AH, Dubuc A, Pages M, Varlet P, Wen PY, Alexander BM, Chi S, Alexandrescu S, Kittler R, Bachoo R, Bandopadhyay P, Beroukhim R, Ligon KL. ALK amplification and rearrangements are recurrent targetable events in congenital and adult glioblastoma. *Clinical Cancer Research.* 2023 Feb 13. doi: 10.1158/1078-0432.CCR-21-3521
18. Zhao S, Mekbib KY, A van der Ent M, Allington G, Prendergast A, Chau JE, Smith H, Shohfi J, Ocken J, Duran D, Furey CG, Thi Li H, Duy PQ, Reeves BC, Zhang J, Nelson-Williams C, Chen D, Li B, Nottolo T, Bai S, Rolle M, Zeng X, Dong W, Fu P, Wang Y, Mane S, Piwowarczyk P, Fehnel KP, See AP, Iskandar BJ, Aagaard-Kienitz B, Kundishora AJ, DeSpenza T, Greenber ABW, Kidanemariam SM, Hale AT, Johnston JM, Jackson EM, Storm PB, Lang S, Butler WE, Carter BS, Chapman P, Stapleton CJ, Patel AB, Rodesch G, Smajda S, Berenstein A, Barak T, Erson-Omay EZ, Zhao H, Moreno-de-Luca A, Proctor MR, Smith ER, Orbach DB, Alper SL, Nicoli S, Boggon TJ, Lifton RP, Gunel M, King PD, Jin SC, Kahle KT. Genetic dysregulation of an endothelial Ras signaling network in vein of Galen malformations. *bioRxiv.* 2023 March 21. doi: 10.1101/2023.03.18.532837.
19. Warf BC, Weber DS, Day EL, Riordan CP, Staffa SJ, Baird LC, Fehnel KP, Stone SSD. Endoscopic third ventriculostomy with choroid plexus cauterization: predictors of long-term success and comparison with shunt placement for primary treatment of infant hydrocephalus. *J Neurosurgery Pediatrics.* 2023 May 12:1-13. doi: 10.3171/2023.4.PEDS2310
20. Slingerland AL, Papadakis JE, Staffa SJ, Scott RM, See AP, Orbach DB, Fehnel KP. Management of Choroid Plexus Tumors and the Benefit of Preoperative Embolization in Pediatric Patients: Report of 46 Cases from a Single Institution. *World Neurosurg.* 2024 Jan;181. doi: 10.1016/j.wneu.2023.11.044. Epub 2023 Nov 17. PMID: 37977483.
21. Lynch BT, Slingerland AL, Robson CD, Ghosh PS, Hedequist DJ, Proctor MR, Fehnel KP. Single-institution Series of Hirayama Disease in North America. *Clin Spine Surg.* 2024 Feb 1;37(1):9-14. doi: 10.1097/BSD.0000000000001492. Epub 2023 Jul 24. PMID: 37491712.
22. Karsten MB, Slingerland AL, Riordan CP, Smith ER, Fehnel KP. Benefits and limitations of a dual faculty neurosurgeon approach to resection of pediatric craniopharyngioma. *Childs Nerv Syst.* 2024 Mar;40(3):647-653. doi: 10.1007/s00381-023-06185-8. Epub 2023 Oct 20. PMID: 37857860.
23. Yeo KK, Macrae CB, Gampel B, Ahrendsen JT, Lidov H, Wright KD, Chi S, Fehnel K, Baird L, Clymer J, Aldape K, Alexandrescu S. Clinical utility of DNA methylation profiling for choroid plexus tumors. *Neurooncol Adv.* 2024 Jun 12;6(1). doi: 10.1093/noajnl/vdae097. PMID: 38962753; PMCID: PMC11221062.
24. Villanueva OP, Papadakis JE, Mosher AM, Cooney T, Fehnel KP. The disparity in pediatric spinal cord tumor clinical trials: A scoping review of registered clinical trials from 1989 to 2023. *Neurooncol Pract.* 2024 May 17;11(5):532-545. doi: 10.1093/nop/npae041. PMID: 39279782; PMCID: PMC11398943.



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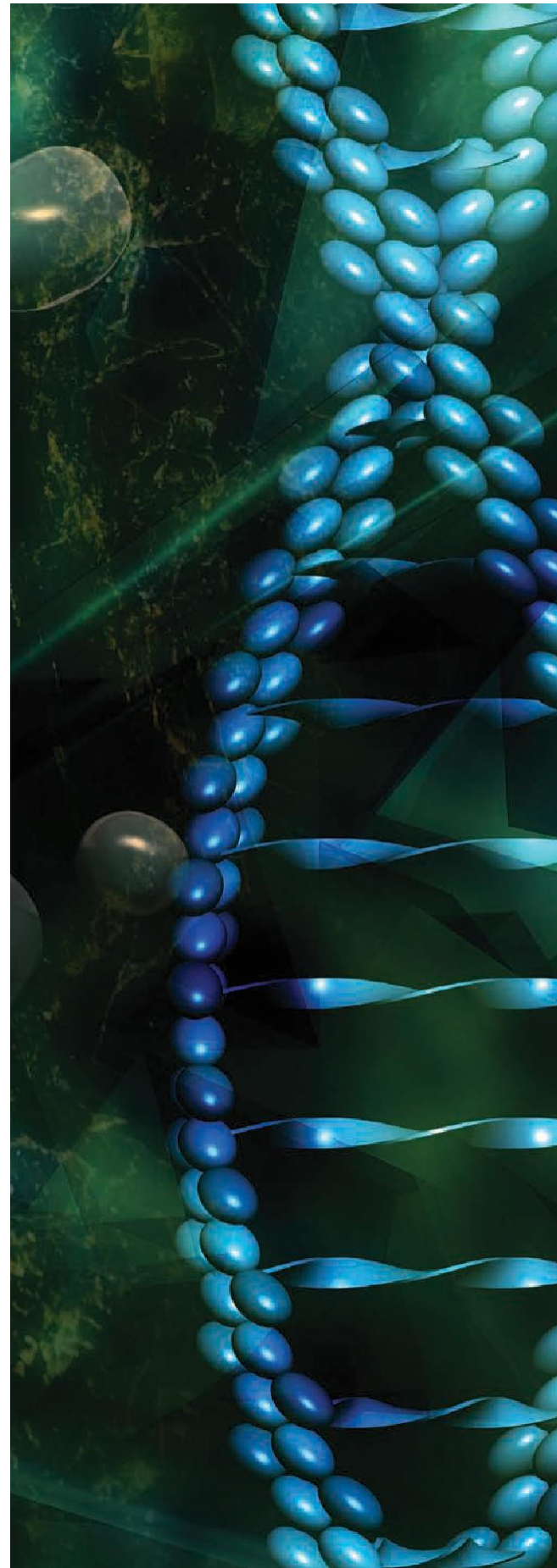
CLINICAL INTERESTS

Movement disorders, maternal fetal care, spina bifida and spinal cord conditions

PUBLICATIONS

1. Northam WT, Alexander A, Carneiro K. Sport-Related Concussion Preceding Adrenal Insufficiency and Hypopituitarism. *Curr Sports Med Rep.* 2020 Jan;19(1):8–10.
2. Harbert A, Northam WT, Elton S, Quinsey C. Targeted head CT reduction for pediatric patients with hydrocephalus and traumatic brain injury: academic center institutional experience as an example of opportunities for further improvement. *Childs Nerv Syst.* 2020 Mar;36(3):583–9.
3. Harbert A, Bradford K, Ritter V, Northam WT, Quinsey C. National Imaging Trends in Pediatric Traumatic Brain Injury and Hydrocephalus. *World Neurosurg.* 2020 Jul;139:e399–405.
4. Northam WT, Cools MJ, Chandran A, Alexander A, Mihalik JP, Guskiewicz KM, et al. Sports Medicine Fellowship Training Improves Sport-related Concussion Evaluation. *Curr Sports Med Rep.* 2020 Jul;19(7):272–6.
5. Northam WT, Chandran A, Adams C, Barczak-Scarboro NE, Quinsey C. Cranioplasty length of stay: Relationship with indication, surgical decision-making factors, and sex. *Trauma.* 2020 Oct 1;22(4):256–64.
6. Cools MJ, Northam WT, Boyd M, Alexander A, Mihalik JP, Guskiewicz KM, et al. Evaluating Primary Care Management of Acute Sport-Related Concussion. *International Journal of Athletic Therapy and Training.* 2021 Mar 4;26(3):148–53.
9. Pajer HB, Asher AM, Gelinne A, Northam WT, van Duin D, Quinsey CS. Impact of Surgical and Medical Treatment on Survival of Patients with Cerebral Aspergillois: Systematic Review of the Literature. *World Neurosurg.* 2021 May;149:244-248.e13.
10. Kessler BA, Goh JL, Pajer HB, Asher AM, Northam WT, Hung SC, et al. Rapid-sequence MRI for evaluation of pediatric traumatic brain injury: a systematic review. *Journal of Neurosurgery: Pediatrics.* 2021 Jun 25;28(3):278–86.

11. Hori YS, Gramer RM, Penumaka A, Northam WT, See AP. Multifocal Subdural Hematoma in a Teenager after a Fourth-Dimension Roller Coaster Ride. *Pediatr Neurosurg.* 2022;57(2):138–40.
12. Blitz SE, McMahon JT, Chalif JI, Jarvis CA, Segar DJ, Northam WT, et al. Intracranial complications of hypercoagulability and superinfection in the setting of COVID-19: illustrative cases. *J Neurosurg Case Lessons.* 2022 May 23;3(21).
13. Northam WT, Slingerland AL, Orbach DB, Smith ER. Magnetic Resonance Imaging/Angiography Versus Catheter Angiography for Annual Follow-up of Pediatric Moyamoya Patients: a Cost Outcomes Analysis. *Neurosurgery.* 2023 Jun;92(6):1243–1248
14. Zaman Z, Straka N, Pinto AL, Srouji R, Tam A, Periasamy U, Stone S, Kleinman M, Northam WT, Ebrahimi-Fakhari. Deep Brain Stimulation For Medically-Refractory Status Dystonicus in UBA5-related Disorder. *Movement Disorders.* 2023
15. Kappel AD, Lehman LL, Northam WT, See AP, and Smith ER. Pediatric moyamoya syndrome secondary to tuberculous meningitis: a case report. *Neurology: Clinical Practice.* 2023, Vol.13 (1)
16. Buxton K, Morgan A, Northam WT, Stone SD. Recurrent abdominal dislodgement of an intrathecal pump: utility of infraclavicular site for patients with elevated body mass index. *J Neurosurg Case Lessons.* 5(4): CASE22472, 2023



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CLINICAL INTERESTS

Surgical treatment of epilepsy, minimally invasive laser surgery, hemispherectomy, vagal nerve stimulator, invasive phase II monitoring for epilepsy, hydrocephalus, fetal anomalies, chiari malformations, brain tumors, congenital anomalies

PUBLICATIONS

Research Investigations

1. Sansevere AJ, Henderson LA, Stredny CM, [...] Madsen J [...]. Posterior-onset Rasmussen's encephalitis with ipsilateral cerebellar atrophy and uveitis resistant to rituximab. *Epilepsy Behav Rep.* 2020;14:100360. Published 2020 Mar 21.
2. Tamilia E, Dirodi M, Alhilani M, [...] Madsen J [...]. Scalp ripples as prognostic biomarkers of epileptogenicity in pediatric surgery. *Ann Clin Transl Neurol.* 2020;7(3):329–342. doi:10.1002/acn3.50994
3. Alhilani M, Tamilia E, Ricci L, [...] Madsen J [...]. Ictal and interictal source imaging on intracranial EEG predicts epilepsy surgery outcome in children with focal cortical dysplasia. *ClinNeurophysiol.* 2020;131(3):734–743. doi:10.1016/j.clinph.2019.12.408
4. Peters JM, Hyde DE, Chu CJ, [...] Madsen J, Stone SS [...]. Lesion-Constrained Electrical Source Imaging: A Novel Approach in Epilepsy Surgery for Tuberous Sclerosis Complex. *J Clin Neurophysiol.* 2020;37(1):79–86. doi:10.1097/WNP.0000000000000615
5. 26. Park YS, Cosgrove GR, Madsen JR [...]. of Human Epileptic Seizures Based Early Detection on Intracortical Microelectrode Array Signals. *IEEE Trans Biomed Eng.* 2020;67(3):817–831. doi:10.1109/TBME.2019.2921448
6. Madsen JR, Boyle TP, Neuman MI, Park E, Tamber MS, Hickey RW, Heuer GG, Zorc JJ, Leonard JR, Leonard JC, Keating R, Chamberlain JM, Frim DM, Zakrzewski P, Klinge P, Merck LH, Piatt J, Bennett JE, Sandberg DI, Boop FA, Hameed MQ. Diagnostic Accuracy of Non-Invasive Thermal Evaluation of Ventriculoperitoneal Shunt Flow in Shunt Malfunction: A Prospective, Multi-Site, Operator-Blinded Study. *Neurosurgery.* 2020;nyaa128. doi:10.1093/neuros/nyaa128 (published online ahead of print, 2020 May 27).
7. Grayson, L; Peters, J; Stone, S.S; Madsen, J.R; [...] Pilot Study of Neurodevelopmental Impact of Early Epilepsy Surgery in Tuberous Sclerosis Complex, *Pediatric Neurology,* (2020). <https://doi.org/10.1016/j.pediatrneurol.2020.04.002>.

8. Levin, D.N., McClain, C.D., Stone, S.S., Madsen, J.R. and Soriano, S. (2020), Anesthetic Management and Outcomes For MRI-Guided Laser Interstitial Thermal Therapy (LITT) For Seizure Focus in Pediatrics: A Single Centre Experience With 10 Consecutive Patients. *Pediatr Anaesth.* Accepted Author Manuscript. doi:10.1111/pan.13929
9. Bernstock JD, Olsen HE, Segar D [...] Madsen JR. Corpus callosotomy for refractory epilepsy in Aicardi syndrome: a case report and focused review of the literature [published online ahead of print, 2020 Jul 8]. *World Neurosurg.* 2020;S1878-8750(20)31508-4.
10. Porter Z, Yang G, Vuong S, Hanna B, Madsen J, Vadivelu S. In situ clearance of a proximal shunt malfunction in a child with hydrocephalus post cerebral arteriovenous malformation rupture noted intraoperatively. *Surg Neurol Int.* 2020;11:116. Published 2020 May 16. doi:10.25259/SNI_156_2020
11. Stone S, Madsen JR, Bolton J, Pearl PL, Chavakula V, Day E. A Standardized Electrode Nomenclature for Stereoelectroencephalography Applications [published online ahead of print, 2020 Jul 23]. *J Clin Neurophysiol.*
12. Falcone J, Ho C, Eskandari R, Vadivelu S, Madsen JR, Muhonen MG. A Noninvasive Retrograde Flushing System for Shunted Hydrocephalus: Initial Case Series of 25 Patients. *Cureus.* 2020;12(7):e8940. Published 2020 Jul 1. doi:10.7759/cureus.8940
13. Sun Y, Dhamne SC, Carretero-Guillén A, Salvador R, Goldenberg MC, Godlewski BR, Pascual-Leone A, Madsen JR, Stone SSD, Ruffini G, Márquez-Ruiz J, Rotenberg A. Drug- Responsive Inhomogeneous Cortical Modulation by Direct Current Stimulation. *Ann Neurol.* 2020 Sep;88(3):489-502. doi: 10.1002/ana.25822. Epub 2020 Jul 25. PMID: 32542794.
14. Chua MMJ, Bushlin I, Stredny CM, Madsen JR, Patel AA, Stone S. Magnetic resonance imaging-guided laser-induced thermal therapy for functional hemispherotomy in a child with refractory epilepsy and multiple medical comorbidities. *J Neurosurg Pediatr.* 2020 Oct 23:1-6. doi: 10.3171/2020.6.PEDS20455. Epub ahead of print. PMID: 33096521.
15. Dickey CW, Sargsyan A, Madsen JR, Eskandar EN, Cash SS, Halgren E. Travelling spindles create necessary conditions for spike-timing-dependent plasticity in humans. *Nat Commun.* 2021 Feb 15;12(1):1027. doi: 10.1038/s41467-021-21298-x. PMID: 33589639; PMCID: PMC7884835.
16. Tamlia E, Matarrese MAG, Ntolkeras G, Grant PE, Madsen JR, Stufflebeam SM, Pearl PL, Papadelis C. Noninvasive Mapping of Ripple Onset Predicts Outcome in Epilepsy Surgery. *Ann Neurol.* 2021 May;89(5):911-925. doi: 10.1002/ana.26066. Epub 2021 Mar 24. PMID: 33710676; PMCID: PMC8229023.
17. Ntolkeras G, Tamlia E, Alhilani M, Bolton J, Ellen Grant P, Prabhu SP, Madsen JR, Stufflebeam SM, Pearl PL, Papadelis C. Presurgical accuracy of dipole clustering in MRI-negative pediatric patients with epilepsy: Validation against intracranial EEG and resection. *Clin Neurophysiol.* 2021 Mar 26:S1388-2457(21)00480-6. doi: 10.1016/j.clinph.2021.01.036. Epub ahead of print. PMID: 33875376.
18. Ricci L, Tamlia E, Alhilani M, Alter A, Scott Perry M, Madsen JR, Peters JM, Pearl PL, Papadelis C. Source imaging of seizure onset predicts surgical outcome in pediatric epilepsy. *Clin Neurophysiol.* 2021 Jul;132(7):1622-1635. doi: 10.1016/j.clinph.2021.03.043. Epub 2021 Apr 28. PMID: 34034087; PMCID: PMC8202024.
19. Paulk AC, Yang JC, Cleary DR, Soper DJ, Halgren M, O'Donnell AR, Lee SH, Ganji M, Ro YG, Oh H, Hossain L, Lee J, Tchoe Y, Rogers N, Kiliç K, Ryu SB, Lee SW, Hermiz J, Gilja V, Ulbert I, Fabó D, Thesen T, Doyle WK, Devinsky O, Madsen JR, Schomer DL, Eskandar EN, Lee JW, Maus D, Devor A, Fried SI, Jones PS, Nahed BV, Ben-Haim S, Bick SK, Richardson RM, Raslan AM, Siler DA, Cahill DP, Williams ZM, Cosgrove GR, Dayeh SA, Cash SS. Microscale Physiological Events on the Human Cortical Surface. *Cereb Cortex.* 2021 Jul 5;31(8):3678-3700. doi: 10.1093/cercor/bhab040. PMID: 33749727; PMCID: PMC8258438.
20. Iandolo G, Chourasia N, Ntolkeras G, Madsen JR, Papadelis C, Grant E, Pearl PL, Taffoni F, Tamlia E. Changes in the Functional Brain Network of Children Undergoing Repeated Epilepsy Surgery: An EEG Source Connectivity Study. *Diagnostics (Basel).* 2021 Jul 9;11(7):1234. doi: 10.3390/diagnostics11071234. PMID: 34359317; PMCID: PMC8306224.
21. Wang J, Tao A, Anderson WS, Madsen JR, Kreiman G. Mesoscopic physiological interactions in the human brain reveal small-world properties. *Cell Rep.* 2021 Aug 24;36(8):109585. doi: 10.1016/j.celrep.2021.109585. PMID: 34433053; PMCID: PMC8457376.
22. Yang VB, Madsen JR. Extensions of Granger Causality Calculations on Brain Networks for Efficient and Accurate Seizure Focus Identification via iEEGs. *Brain Sci.* 2021 Sep 1;11(9):1167. doi: 10.3390/brainsci11091167. PMID: 34573188; PMCID: PMC8471554.
23. Jahromi S, Matarrese MAG, Tamlia E, Perry MS, Madsen JR, Pearl PL, Papadelis C. Mapping Propagation of Interictal Spikes, Ripples, and Fast Ripples in Intracranial EEG of Children with Refractory Epilepsy. *Annu Int Conf IEEE Eng Med Biol Soc.* 2021 Nov;2021:194-197. doi: 10.1109/EMBC46164.2021.9630250. PMID: 34891270.
24. Corona L, Tamlia E, Madsen JR, Stufflebeam SM, Pearl PL, Papadelis C. Mapping Functional Connectivity of Epileptogenic Networks through Virtual Implantation. *Annu Int Conf IEEE Eng Med Biol Soc.* 2021 Nov;2021:408411. doi:10.1109/EMBC46164.2021.9629686. PMID: 34891320.
25. Matarrese MAG, Loppini A, Jahromi S, Tamlia E, Fabbri L, Madsen JR, Pearl PL, Filippi S, Papadelis C. Electric Source Imaging on Intracranial EEG Localizes Spatiotemporal Propagation of Interictal Spikes in Children with Epilepsy. *Annu Int Conf IEEE Eng Med Biol Soc.* 2021 Nov;2021:2668-2671. doi: 10.1109/EMBC46164.2021.9630246. PMID: 34891801.
26. Barrit S, Park EH, El Hadwe S, Madsen JR. Complete Corpus Callosotomy for Refractory Epilepsy in Children. *World Neurosurg.* 2022 Apr 30;164:69. doi: 10.1016/j.wneu.2022.04.099. Epub ahead of print. PMID: 35500873.
27. Billardello R, Ntolkeras G, Chericoni A, Madsen JR, Papadelis C, Pearl PL, Grant PE, Taffoni F, Tamlia E. Novel User-Friendly Application for MRI Segmentation of Brain Resection following Epilepsy Surgery. *Diagnostics (Basel).* 2022 Apr 18;12(4):1017. doi: 10.3390/diagnostics12041017. PMID: 35454065; PMCID: PMC9032020.
28. Barrit S, Park EH, Rotenberg A, Kaye H, Pearl PL, Madsen JR. Single-stage resection of bottom-of-a-sulcus dysplasia involving eloquent cortex using navigated transcranial magnetic stimulation and intraoperative modalities. *Childs Nerv Syst.* 2022 Apr 21. doi: 10.1007/s00381-022-05532-5. Epub ahead of print. PMID: 35449311.
29. Barrit S, Park EH, Madsen JR. Posterior quadrant disconnection for refractory epilepsy: how I do it. *Acta Neurochir (Wien).* 2022 May 17. doi: 10.1007/s00701-022-05221-x. Epub ahead of print. PMID: 35578117.
30. Ricci L, Matarrese M, Peters JM, Tamlia E, Madsen JR, Pearl PL, Papadelis C. Virtual implantation using conventional scalp EEG delineates seizure onset and predicts surgical outcome in children with epilepsy. *Clin Neurophysiol.* 2022 Jul;139:49-57. doi: 10.1016/j.clinph.2022.04.009. Epub 2022 Apr 26. PMID: 35526353.
31. Papadelis C, Ricci L, Matarrese MAG, Peters JM, Tamlia E, Madsen J, Pearl PL. Reply to "Added value of high-resolution electrical source imaging of ictal activity in children with structural focal epilepsy". *Clin Neurophysiol.* 2022 Jun 15:S1388-2457(22)00293-0. doi: 10.1016/j.clinph.2022.06.001. Epub ahead of print. PMID: 35728995.
32. Chavakula V, Madsen J, Stone S. SEEG in Children. In: Schuele SU (ed). *A Practical Approach to Stereo EEG.* 2020 New York, NY: Springer
33. Xiao Y, Chou CC, Cosgrove GR, Crone NE, Stone S, Madsen JR, Reucroft I, Shih YC, Weisholtz D, Yu HY, Anderson WS, Kreiman G. Cross-task specificity and within-task invariance of cognitive control processes. *Cell Rep.* 2023 Jan 31;42(1):111919. doi: 10.1016/j.celrep.2022.111919. Epub 2023 Jan 10. PMID: 36640346; PMCID: PMC9993332.
34. Corona L, Tamlia E, Perry MS, Madsen JR, Bolton J, Stone SSD, Stufflebeam SM, Pearl PL, Papadelis C. Non-invasive mapping of epileptogenic networks predicts surgical outcome. *Brain.* 2023 May 2;146(5):1916-1931. doi: 10.1093/brain/awac477. PMID: 36789500; PMCID: PMC10151194.
35. Chikara RK, Jahromi S, Tamlia E, Madsen JR, Stufflebeam SM, Pearl PL, Papadelis C. Electromagnetic source imaging predicts surgical outcome in children with focal cortical dysplasia. *Clin Neurophysiol.* 2023 Sep;153:88-101. doi: 10.1016/j.clinph.2023.06.015. Epub 2023 Jul 5. PMID: 37473485; PMCID: PMC10528204.

38. Chourasia N, Stone SSD, Tsuboyama M, Madsen JR, Ryan M, Zhang B, Libenson MH, Bolton J, Harini C. Influence of extent and age at corpus callosotomy on seizure outcomes. A single center experience. *Epilepsia Open*. 2023 Aug 21. doi: 10.1002/epi4.12819. Epub ahead of print. PMID: 37602493.
39. Phillips HW, Rangwala SD, Papadakis J, Segar DJ, Tsuboyama M, Pinto ALR, Harmon JP, Soriano SG, Munoz CJ, Madsen JR, See AP, Stone SS. Focal drug-resistant temporal lobe epilepsy associated with an ipsilateral anterior choroidal artery aneurysm: illustrative case. *J Neurosurg Case Lessons*. 2023 Jun 26;5(26):CASE23156. doi: 10.3171/CASE23156. PMID: 37399139.
40. Barrit S, Madsen JR. Reply to: "How to disconnect the splenium and fornix in posterior quadrant disconnection, hemispherotomy, and subtotal hemispherotomy". *Acta Neurochir (Wien)*. 2023 Mar;165(3):741. doi: 10.1007/s00701-023-05518-5. Epub 2023 Feb 14. PMID: 36786869.
41. Rijal S, Corona L, Perry MS, Tamilia E, Madsen JR, Stone SSD, Bolton J, Pearl PL, Papadelis C. Functional connectivity discriminates epileptogenic states and predicts surgical outcome in children with drug resistant epilepsy. *Sci Rep*. 2023 Jun 14;13(1):9622. doi: 10.1038/s41598-023-36551-0. PMID: 37316544; PMCID: PMC10267141.
42. Lee S, Deshpande SS, Merricks EM, Schlafly E, Goodman R, McKhann GM, Eskandar EN, Madsen JR, Cash SS, van Putten MJAM, Schevon CA, van Drongelen W. Spatiotemporal spike-centered averaging reveals symmetry of temporal and spatial components of the spike-LFP relationship during human focal seizures. *Commun Biol*. 2023 Mar 25;6(1):317. doi: 10.1038/s42003-023-04696-3. PMID: 36966217; PMCID: PMC10039941
43. Slingerland AL, Chua MMJ, Bolton J, Staffa SJ, Tsuboyama M, Prabhu SP, Pearl PL, Madsen JR, Stone SSD. Stereoelectroencephalography followed by combined electrode removal and MRI-guided laser interstitial thermal therapy or open resection: a single-center series in pediatric patients with medically refractory epilepsy. *J Neurosurg Pediatr*. 2022 Dec 9;31(3):206-211. doi: 10.3171/2022.11.PEDS22262. PMID: 36681974.
44. Chericoni A, Ricci L, Ntolkeras G, Billardello R, Stone SSD, Madsen JR, Papadelis C, Grant PE, Pearl PL, Taffoni F, Rotenberg A, Tamilia E. Sleep Spindle Generation Before and After Epilepsy Surgery: A Source Imaging Study in Children with Drug-Resistant Epilepsy. *Brain Topogr*. 2023 Sep 22. doi: 10.1007/s10548-023-01007-1. Epub ahead of print. PMID: 37737957.
45. Matarrese MAG, Loppini A, Fabbri L, Tamilia E, Perry MS, Madsen JR, Bolton J, Stone SSD, Pearl PL, Filippi S, Papadelis C. Spike propagation mapping reveals effective connectivity and predicts surgical outcome in epilepsy. *Brain*. 2023 Sep 1;146(9):3898-3912. doi: 10.1093/brain/awad118. PMID: 37018068; PMCID: PMC10473571.
46. Chericoni A, Ricci L, Ntolkeras G, Billardello R, Stone SSD, Madsen JR, Papadelis C, Grant PE, Pearl PL, Taffoni F, Rotenberg A, Tamilia E. Sleep Spindle Generation Before and After Epilepsy Surgery: A Source Imaging Study in Children with Drug-Resistant Epilepsy. *Brain Topogr*. 2024 Jan;37(1):88-101. doi: 10.1007/s10548-023-01007-1. Epub 2023 Sep 22. PMID: 37737957.
47. Merricks EM, Deshpande SS, Agopyan-Miu AH, Smith EH, Schlafly ED, McKhann GM, Goodman RR, Sheth SA, Greger B, House PA, Eskandar EN, Madsen JR, Cash SS, Trevelyan AJ, van Drongelen W, Schevon CA. Aberrant fast spiking interneuronal activity precedes seizure transitions in humans. *medRxiv [Preprint]*. 2024 Jan 26;2024.01.26.24301821. doi: 10.1101/2024.01.26.24301821. PMID: 38343792; PMCID: PMC10854323.
48. Phillips HW, D'Gama AM, Wang Y, Chahine Y, Chiu M, Swanson AC, Ahtam B, Bolton JB, Madsen JR, Lee EA, Prabhu SP, Lidov HG, Papadakis J, Huang AY, Poduri A, Stone SS, Walsh CA. Somatic Mosaicism in PIK3CA Variant Correlates With Stereoelectroencephalography-Derived Electrophysiology. *Neurol Genet*. 2023 Dec 22;10(1). doi: 10.1212/NXG.0000000000200117. PMID: 38149038; PMCID: PMC10751024.
49. Ntolkeras G, Makaram N, Bernabei M, De La Vega AC, Bolton J, Madsen JR, Stone SSD, Pearl PL, Papadelis C, Grant EP, Tamilia E. Interictal EEG source connectivity to localize the epileptogenic zone in patients with drug-resistant epilepsy: A machine learning approach. *Epilepsia*. 2024 Apr;65(4):944-960. doi: 10.1111/epi.17898. Epub 2024 Feb 6. PMID: 38318986; PMCID: PMC11018464.
51. Barrit S, Hadwe SE, Carron R, Madsen JR. Letter to the Editor. Rise of large language models in neurosurgery. *J Neurosurg*. 2024 May 17;141(3):878-880. doi: 10.3171/2024.3.JNS24610. PMID: 38759241.
52. Yang VB, Yang AB, Menta AK, Zhao X, Blum J, Madsen JR, Anderson WS. Characterizing the safety profile of vagus nerve stimulation devices for epilepsy from 21,448 manufacturer and user reports. *J Neurosurg*. 2024 Jun 14:1-15. doi: 10.3171/2024.3.JNS231942. Epub ahead of print. PMID: 38875724.
53. Bourdillon P, Ren L, Halgren M, Paulk AC, Salami P, Ulbert I, Fabó D, King JR, Sjoberg KM, Eskandar EN, Madsen JR, Halgren E, Cash SS. Differential cortical layer engagement during seizure initiation and spread in humans. *Nat Commun*. 2024 Jun 17;15(1):5153. doi: 10.1038/s41467-024-48746-8. PMID: 38886376; PMCID: PMC11183216.
54. D'Gama AM, Phillips HW, Wang Y, Chiu MY, Chahine Y, Swanson AC, Smith RS, Pearl PL, Tsuboyama M, Madsen JR, Lidov H, Lee EA, Prabhu SP, Huang AY, Stone SSD, Walsh CA, Poduri A. Analysis of DNA from brain tissue on stereo-EEG electrodes reveals mosaic epilepsy-related variants. *medRxiv [Preprint]*. 2024 Jul 22:2024.07.21.24310779. doi: 10.1101/2024.07.21.24310779. PMID: 39108522; PMCID: PMC11302611.
55. Phillips HW, Papadakis JE, Borden BA, Pinto A, Tsuboyama M, Chiu MY, Madsen JR, Patil R, Stone SSD. Intralesional epileptiform activity in a fourth ventricular hamartoma associated with epileptic hemifacial spasm in a toddler: illustrative case. *J Neurosurg Case Lessons*. 2024 Jul 29;8(5). doi: 10.3171/CASE2452. PMID: 39074398; PMCID: PMC11301596.
56. Discenza M, Papadakis JE, Little S, Madsen JR. Safety of Pregnancy and Delivery With Shunted Hydrocephalus. *JAMA Netw Open*. 2024 Sep 3;7(9). doi: 10.1001/jamanetworkopen.2024.34688. PMID: 39292463; PMCID: PMC11411382.
57. Jahromi S, Matarrese MAG, Fabbri L, Tamilia E, Perry MS, Madsen JR, Bolton J, Stone SSD, Pearl PL, Papadelis C. Overlap of spike and ripple propagation onset predicts surgical outcome in epilepsy. *Ann Clin Transl Neurol*. 2024 Oct;11(10):2530-2547. doi: 10.1002/acn3.52156. Epub 2024 Oct 7. PMID: 39374135; PMCID: PMC11514932.





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MEDICAL SCHOOL

Columbia University, College of
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Columbia Presbyterian Medical Center, 1991

RESIDENCY

Children's National Medical
Center, Pediatric Neurosurgery,
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FELLOWSHIP

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CLINICAL INTERESTS

Craniosynostosis, Chiari malformations,
craniofacial anomalies or disorders, brain tumors,
spinal cord tumors, spinal disorders, neuro-
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PUBLICATIONS

1. Dagi LR, Rogers GF, Proctor MR, Meara JG. Age at Craniostomy Surgery and Its Impact on Ophthalmologic Diagnoses: A Single-Center Retrospective Review. *Plast Reconstr Surg*. 2020 Sep; 146(3):375e-376e
2. Goobie SM, Staffa SJ, Meara JG, Proctor MR [...] High-dose versus low-dose tranexamic acid for paediatric craniostomy surgery: a double-blind randomised controlled non-inferiority trial [published online ahead of print, 2020 Jun 30]. *Br J Anaesth*. 2020;S0007-0912(20)
3. Proctor MR, Meara JG: A review of the management of single-suture craniostomy, past, present, and future. *J Neurosurg Pediatr* 24:622-631, 2019
4. O'Neill NP, Hresko MT, Emans JB, Glotzbecker MP, Verhofste BP, Karlin LI, Proctor MR, Hedequist DJ Acute Implant-related Complications in Pediatric Cervical Spine Fusion. *J Pediatr Orthop*, 2019
5. Riordan CP, Zurakowski D, Meier PM, Alexopoulos G, Meara JG, Proctor MR, Goobie SM. Minimally Invasive Endoscopic Surgery for Infantile Craniostomy: A Longitudinal Cohort Study. *J Pediatr*, 2019
6. Yang BW, Hedequist DJ, Proctor MR, Troy M, Hresko MT, Glotzbecker MP: Surgical Fixation Using Screw-Rod Construct Instrumentation for Upper Cervical Instability in Pediatric Down Syndrome Patients. *Spine Deform* 7:957- 961, 2019
7. Desai SB, O'Brien C, Shaikh R, [...] Proctor M [...]. Multidisciplinary management of spinal aneurysmal bone cysts: A single-center experience. *Interv Neuroradiol*. 2019;25(5):564-569. doi:10.1177/1591019919848130
8. Cohen LL, Yang BW, O'Neill NP, Proctor MR, Glotzbecker MP, Hedequist DJ. Use of recombinant human bone morphogenetic protein for revision cervical spine fusion in children with Down syndrome: a case series [published online ahead of print, 2020 Jan 31].
9. Day EL, Proctor MR, Scott RM. Surgical volume of simple tethered spinal cord releases: review of a large pediatric neurosurgical service experience [published online ahead of print, 2020 Apr 3]. *J Neurosurg Pediatr*. 2020;1-5. doi:10.3171/2020.2.PEDS19743
10. Rattani A, Riordan CP, Meara JG, Proctor MR. Comparative analysis of cranial vault remodeling versus endoscopic suturectomy in the treatment of unilateral lambdoid craniostomy [published online ahead of print, 2020 Apr 17]. *J Neurosurg Pediatr*. 2020;1-8. doi:10.3171/2020.2.PEDS19522
11. Dagi LR, Rogers GF, Proctor MR, Meara JG. Age at craniostomy surgery and its impact on ophthalmologic diagnoses: A single-center retrospective review [published online ahead of print, 2020 May 26]. *Plast Reconstr Surg*. 2020;10.1097/PRS.00000000000007111. doi:10.1097/PRS.00000000000007111
12. Verhofste BP, Davis EA, Miller PE, [...] Smith ER, Proctor MR [...] Chiari I malformations with syringomyelia: long-term results of neurosurgical decompression. *Spine Deform*. 2020;8(2):233-243. doi:10.1007/s43390-019-00009-z
13. Verhofste BP, Glotzbecker MP, Hresko MT, [...] Proctor MR [...] Intraoperative Use of O-arm in Pediatric Cervical Spine Surgery. *J Pediatr Orthop*. 2020;40(4):e266-e271. doi:10.1097/BPO.0000000000001416
14. DeGrazia M, Ahtam B, Rogers-Vizena CR, Proctor M, Porter C, Vyas R, Laurentys CT, Bergling E, McLaughlin K, Grant PE. Brain Characteristics Noted Prior to and Following Cranial Orthotic Treatment. *Child Neurol Open*. 2020 Aug
15. Verhofste B, Hresko T, Emans J, Glotzbecker M, Snyder B, Birch C, O'Neill N, Karlin L, Proctor M, Hedequist D. Halo- Gravity Traction for the Treatment of Cervical Spine Disorders. *Spine Deform*. 2019 Nov;7(6):1026-1027
16. Hughes CD, Langa O, Nuzzi L, Staffa SJ, Proctor M, Meara JG, Ganske IM. Evaluating Surgical Decision-making in Nonsyndromic Sagittal Craniostomy Using a Digital 3D Model. *Plast Reconstr Surg Glob Open*. 2021 May 21;9(5):e3493. doi:10.1097/GOX.0000000000003493. PMID: 34036018; PMCID: PMC8140767.
17. Proctor MR, Meara JG. Editorial. What is the "value" of surgery in the management of craniostomy? *J Neurosurg Pediatr*. 2021 Oct 15:1-2. doi: 10.3171/2021.6.PEDS21272. Epub ahead of print. PMID: 34653966.
18. Verhofste BP, Hedequist DJ, Birch CM, Rademacher ES, Glotzbecker MP, Proctor MR, Yen YM. Operative Treatment of Cervical Spine Injuries Sustained in Youth Sports. *J Pediatr Orthop*. 2021 Nov-Dec 01;41(10):617-624. doi:10.1097/BPO.0000000000001950. PMID: 34469395.
19. O'Neill NP, Miller PE, Hresko MT, Emans JB, Karlin LI, Hedequist DJ, Snyder BD, Smith ER, Proctor MR, Glotzbecker MP. Scoliosis with Chiari I malformation without associated syringomyelia. *Spine Deform*. 2021 Jan 20
20. Alexiades NG, Shao B, Braga BP, Bonfield CM, Brockmeyer DL, Browd SR, DiLuna M, Groves ML, Hankinson TC, Jea A, Leonard JR, Lew SM, Limbrick DD, Mangano FT, Martin J, Pahys J, Powers A, Proctor MR, Rodriguez L, Rozzelle C, Storm PB, Anderson RCE. Development of best practices in the utilization and implementation of pediatric cervical spine traction: a modified Delphi study. *J Neurosurg Pediatr*. 2021 Apr 2:1-12.
21. Taylor A, Meehan W, Proctor MR. Concussion. In Kliegman, St Geme, Blum, Shah, Tasker and Wilson (Ed.), *Nelson Textbook of Pediatrics*, 22nd Ed., Elsevier Publishing. In press, 2021.
22. Verhofste BP, Hedequist DJ, Birch CM, Rademacher ES, Glotzbecker MP, Proctor MR, Yen YM. Operative Treatment of Cervical Spine Injuries Sustained in Youth Sports. *J Pediatr Orthop*. 2021 Aug 31. doi: 10.1097/BPO.0000000000001950. Epub ahead of print. PMID: 34469395.
23. Hauser BM, Hoffman SE, Gupta S, Zaki MM, Xu E, Chua M, Bernstock JD, Khawaja A, Smith TR, Proctor MR, Zaidi HA. Association of venous thromboembolism following pediatric traumatic spinal injuries with injury severity and longer hospital stays. *J Neurosurg Spine*. 2021 Sep 17:1-doi: 10.3171/2021.3.SPINE201981. Epub ahead of print. PMID: 34534962.
24. Hulsbergen AFC, Siddi F, McAvoy M, Lynch BT, Karsten MB, Stopa BM, Ashby J, McNulty J, Broekman MLD, Gormley WB, Stone SSD, Warf BC, Proctor MR. The Low Utility of Routine Cranial Imaging After Pediatric Shunt Revision. *J Neurosurg Pediatr*. 2021. [Accepted]

25. Wang AY, Sharma V, Bi WL, Curry WT, Florman JE, Groff MW, Heilman CB, Hong J, Kryzanski J, Lollis SS, McGillicuddy GT, Moliterno J, Ogilvy CS, Oh DS, Oyelese AA, Proctor MR, Shear PA, Wakefield AE, Whitmore RG, Riesenburger RI. The New England Neurosurgical Society: growth and evolution over 70 years. *J Neurosurg.* 2022 May 6:1-9. doi: 10.3171/2022.3.JNS212777. Epub ahead of print. PMID: 35523259.

26. Riesel JN, Riordan CP, Hughes CD, Karsten MB, Staffa SJ, Meara JG, Proctor MR. Endoscopic strip craniectomy with orthotic helmeting for safe improvement of head growth in children with Apert syndrome. *J Neurosurg Pediatr.* 2022 Apr 1:1-8. doi: 10.3171/2022.2.PEDS21340. Epub ahead of print. PMID: 35364592.

27. Wang AY, Sharma V, Bi WL, Curry WT, Florman JE, Groff MW, Heilman CB, Hong J, Kryzanski J, Lollis SS, McGillicuddy GT, Moliterno J, Ogilvy CS, Oh DS, Oyelese AA, Proctor MR, Shear PA, Wakefield AE, Whitmore RG, Riesenburger RI. The New England Neurosurgical Society: growth and evolution over 70 years. *J Neurosurg.* 2022 May 6:1-9.

28. He K, Nayak RB, Allori AC, Brighton BK, Cina RA, Ellison JS, Goretsky MJ, Jatana KR, Proctor MR, Grant C, Thompson VM, Iwaniuk M, Cohen ME, Saito JM, Hall BL, Newland JG, Ko CY, Rangel SJ. Correlation Between Postoperative Antimicrobial Prophylaxis Use and Surgical Site Infection in Children Undergoing Nonemergent Surgery. *JAMA Surg.* 2022 Oct 19.

29. Varidel, AD, Meara JG, Proctor MR, Goobie SM. Antifibrinolytics as a patient blood management modality in Craniostomy Surgery: Current concepts and a view of the future. *Current Anesthesiology Reports.* 2023 June.

30. Kanack MD, Proctor MR, Meara JG, Balkin DM, Rodean J, Stringfellow IC, Berry JG. Hospital Variation and Resource Use for Infants with Craniostomy Undergoing Open, Endoscopic, and Distraction Osteogenesis Surgical Techniques. *Cleft Palate Craniofac J.* 2024 Jan 18:10556656241227032. doi: 10.1177/10556656241227032. Epub ahead of print. PMID: 38239039.

31. Lynch BT, Slingerland AL, Robson CD, Ghosh PS, Hedequist DJ, Proctor MR, Fehnel KP. Single-institution

Series of Hirayama Disease in North America. *Clin Spine Surg.* 2024 Feb 1;37(1):9-14. doi: 10.1097/BSD.0000000000001492. Epub 2023 Jul 24. PMID: 37491712.

32. Papadakis JE, Slingerland AL, Rangwala SD, Proctor MR, Shah AS, See AP. Optic Nerve Edema in Pediatric Middle Cranial Fossa Arachnoid Cysts: Report of 51 Patients From a Single Institution. *Pediatr Neurol.* 2024 Jul;156:182-190. doi: 10.1016/j.pediatrneurol.2024.04.008. Epub 2024 Apr 13. PMID: 38788281.

33. Lang SS, Meier PM, Paden WZ, Storm PB, Heuer GG, Bartlett SP, Taylor JA, Swanson JW, Meara JG, Proctor M, Okunowo O, Stricker PA; Pediatric Craniofacial Collaborative Group. Spring-mediated cranioplasty versus endoscopic strip craniectomy for sagittal craniosynostosis. *J Neurosurg Pediatr.* 2021 Jul 23:1-9. doi: 10.3171/2021.2.PEDS20983. Epub ahead of print. PMID: 34298510.

34. Verhofste BP, Hedequist DJ, Birch CM, Rademacher ES, Glotzbecker MP, Proctor MR, Yen YM. Operative Treatment of Cervical Spine Injuries Sustained in Youth Sports. *J Pediatr Orthop.* 2021 Aug 31. doi: 10.1097/BPO.0000000000001950. Epub ahead of print. PMID: 34469395.

35. Hauser BM, Hoffman SE, Gupta S, Zaki MM, Xu E, Chua M, Bernstock JD, Khawaja A, Smith TR, Proctor MR, Zaidi HA. Association of venous thromboembolism following pediatric traumatic spinal injuries with injury severity and longer hospital stays. *J Neurosurg Spine.* 2021 Sep 17:1-7. doi: 10.3171/2021.3.SPINE201981. Epub ahead of print. PMID: 34534962.

36. Chrzanowski S, Baker A, Hayes L, Huff HV, Fenty L, Proctor M, Yang E, Miller K, Maski K. Harlequin Syndrome, Apnea, and Acute on Chronic Hemiparesis: An Atypical Pediatric Case of Chiari I With Holocord Syringohydromyelia. *Pediatr Neurol.* 2022 Jan;126:108-109. doi: 10.1016/j.pediatrneurol.2021.10.002. Epub 2021 Oct 26. PMID: 34788683.



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Endovascular Surgical Neuroradiology, Barrow Neurological Institute, 2017, Phoenix, AZ
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CLINICAL INTERESTS
Arteriovenous fistulas (AVFs), Pediatric stroke, Brain Aneurysms, Brain Arteriovenous Malformation, Cavernous Malformations, Moyamoya in Children, Retinoblastoma, Vein of Galen Malformation (VOGM)

PUBLICATIONS

1. Treatment of complex intracranial pathologies with transcirculation endovascular approaches "Silva MA, See AP, Sur S, Aziz-Sultan MA." *Neurocirugia (Astur : Engl Ed).* 2020 Jul-Aug;31(4):173-183. doi: 10.1016/j.neucir.2019.10.003. Epub 2020 Jan 24. Silva MA *Neurocirugia (Astur : Engl Ed)* 2020 10.1016/j.neucir.2019.10.003

2. Natural History of Hemodynamics in Vertebrobasilar Disease: Temporal Changes in the VERITAS Study Cohort "Amin-Hanjani S, See AP, Du X, Rose-Finnell L, Pandey DK, Chen YF, Elkind MSV, Zipfel GJ, Liebeskind DS, Silver FL, Kasner SE, Gorelick PB, Charbel FT, Derdeyn CP; VERITAS Study Group." *Stroke.* 2020 Nov;51(11):3295-3301. doi: 10.1161/STROKEAHA.120.029909. Epub 2020 Oct 9. Amin-Hanjani S *Stroke* 2020 10.1161/STROKEAHA.120.029909

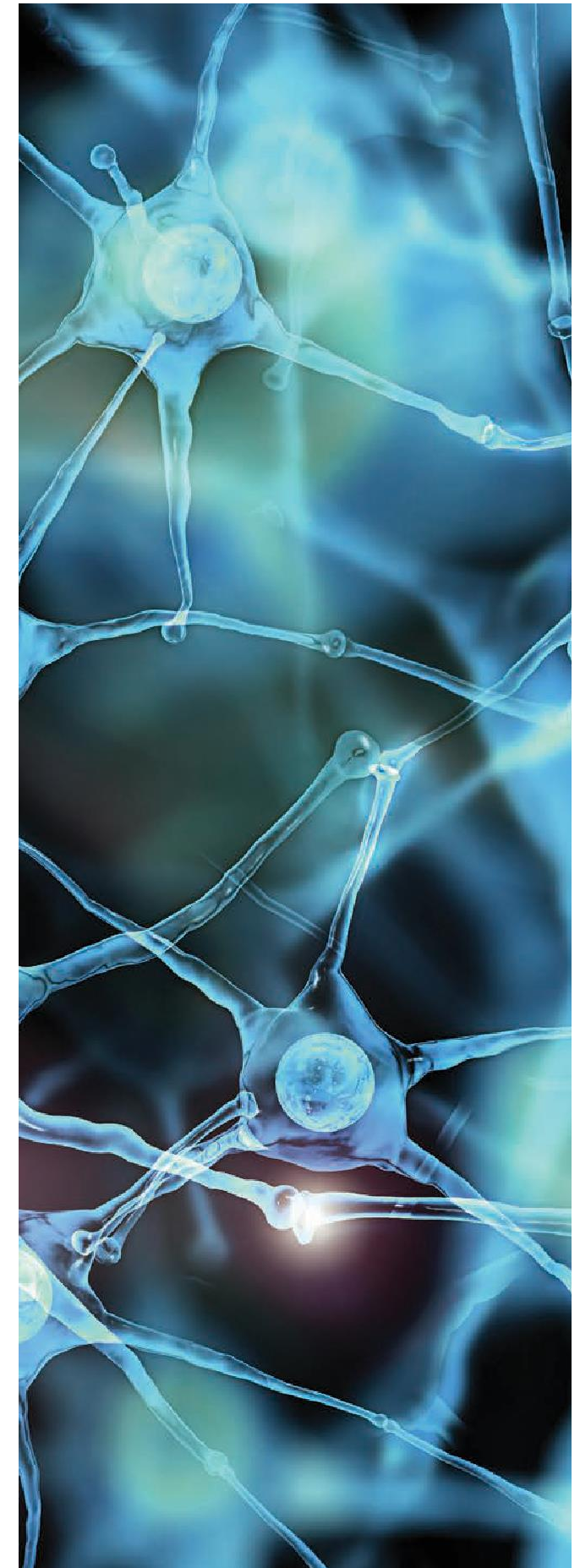
3. Perfusion-MRI is a Poor Indicator of Hemodynamic Compromise in Vertebrobasilar Disease in the VERITAS Study "See AP, Stapleton CJ, Du X, Charbel FT, Amin-Hanjani S; VERITAS Study Group." *J Neuroimaging.* 2021 Jan;31(1):151-154. doi: 10.1111/jon.12802. Epub 2020 Nov 4. See AP *J Neuroimaging* 2021 10.1111/jon.12802

4. Blebs in intracranial aneurysms: prevalence and general characteristics "Salimi Ashkezari SF, Detmer FJ, Mut F, Chung BJ, Yu AK, Stapleton CJ, See AP, Amin-Hanjani S, Charbel FT, Rezai Jahromi B, Niemelä M, Frösen J, Zhou J, Maiti S, Robertson AM, Czebral JR." *J Neurointerv Surg.* 2021 Mar;13(3):226-230. doi: 10.1136/neurintsurg-2020-016274. Epub 2020 Jul 17. Salimi Ashkezari SF *J Neurointerv Surg* 2021 10.1136/neurintsurg-2020-016274

5. Morbidity and mortality associated with sequential flow reduction embolization technique of cerebral arteriovenous malformations using n-butyl cyanoacrylate "See AP, Mohammad MH, Rizko M, Stapleton CJ, Amin-Hanjani S, Charbel FT, Aletich V, Alaraj A." *J Neurointerv Surg.* 2021 Mar;13(3):237-241. doi: 10.1136/neurintsurg-2020-016223. Epub 2020 Aug 14. See AP *J Neurointerv Surg* 2021 10.1136/neurintsurg-2020-016223

6. Intervention for symptomatic vertebrobasilar disease "Bram R, See AP, Amin-Hanjani S." *J Neurosurg Sci*. 2021 Jun;65(3):327-347. doi: 10.23736/S0390-5616.20.05093-6. Epub 2021 Jan 22. Bram RJ *J Neurosurg Sci* 2021 10.23736/S0390-5616.20.05093-6
7. Bypass for flow-augmentation in atherosclerotic carotid occlusion: a review of the literature and career experience "See AP, Charbel FT." *J Neurosurg Sci*. 2021 Jun;65(3):305-321. doi: 10.23736/S0390-5616.21.05094-3. Epub 2021 Mar 11. See AP *J Neurosurg Sci* 2021;65(3):305-321. doi: 10.23736/S0390-5616.21.05094-3
8. Hemodynamics in aneurysm blebs with different wall characteristics "Salimi Ashkezari SF, Mut F, Chung BJ, Yu AK, Stapleton CJ, See AP, Amin-Hanjani S, Charbel FT, Rezaei Jahromi B, Niemelä M, Frösen J, Maiti S, Robertson AM, Cebal JR." *J Neurointerv Surg*. 2021 Jul;13(7):642-646. doi: 10.1136/neurintsurg-2020-016601. Epub 2020 Oct 5. Salimi Ashkezari SF *J Neurointerv Surg* 2021 10.1136/neurintsurg-2020-016601
9. External carotid artery to internal carotid artery transposition to augment flow for a superficial temporal artery to middle cerebral artery bypass associated with severe external carotid artery stenosis "McGuire LS, See AP, Kwasnicki A, Charbel FT." *Acta Neurochir (Wien)*. 2021 Dec;163(12):3495-3499. doi: 10.1007/s00701-021-04974-1. Epub 2021 Aug 21. McGuire LS *Acta Neurochir (Wien)* 2021 10.1007/s00701-021-04974-1
10. Two Sides of a Coin: Case Report of Unilateral Syngangiosis and Contralateral Stroke Highlighting Consequences of Disease Progression and Efficacy of Revascularization in Sickle Cell Disease-Associated Moyamoya Syndrome "Slingerland AL, Karsten MB, Smith ER, Sobota AE, See AP." *Acta Haematol*. 2022;145(4):458-464. doi: 10.1159/000521361. Epub 2021 Dec 8. Slingerland AL *Acta Haematol* 2022 10.1159/000521361
11. Multifocal Subdural Hematoma in a Teenager after a Fourth-Dimension Roller Coaster Ride "Hori YS, Gramer RM, Penumaka A, Northam WT, See AP." *Pediatr Neurosurg*. 2022;57(2):138-140. doi: 10.1159/000523780. Epub 2022 Feb 24. Hori YS *Pediatr Neurosurg* 2022 10.1159/000523780
12. Intracranial venous malformation masquerading as a meningioma in PI3KCA-related overgrowth spectrum disorder "Filippidis A, Lidov H, Al-Ibraheemi A, See AP, Srivastava S, Orbach DB, Fehnel KP." *Am J Med Genet A*. 2022 Mar;188(3):907-910. doi: 10.1002/ajmg.a.62570. Epub 2021 Dec 2. Filippidis A *Am J Med Genet A* 2022 10.1002/ajmg.a.62570
13. Percutaneous transuterine fetal cerebral embolisation to treat vein of Galen malformations at risk of urgent neonatal decompensation: study protocol for a clinical trial of safety and feasibility "See AP, Wilkins-Haug LE, Benson CB, Tworetzky W, Orbach DB." *BMJ Open*. 2022 May 24;12(5):e058147. doi: 10.1136/bmjopen-2021-058147. See AP *BMJ Open* 2022 10.1136/bmjopen-2021-058147
14. Complete Neurological Recovery After Emergency Burr Hole Placement Utilizing EZ-IO® for Epidural Hematoma "Grossman M, See AP, Mannix R, Simon EL." *J Emerg Med*. 2022 Oct;63(4):557-560. doi: 10.1016/j.jemermed.2022.06.012. Epub 2022 Oct 10. Grossman MJ *J Emerg Med* 2022 10.1016/j.jemermed.2022.06.012
15. Pediatric Moyamoya Biomarkers: Narrowing the Knowledge Gap "Lehman LL, Kaseka ML, Stout J, See AP, Pabst L, Sun LR, Hassanein SA, Waak M, Vossough A, Smith ER, Dlamini N." *Semin Pediatr Neurol*. 2022 Oct;43:101002. doi: 10.1016/j.spen.2022.101002. Epub 2022 Sep 15. Lehman LL *Semin Pediatr Neurol* 2022 10.1016/j.spen.2022.101002
16. Closing the Gap in Pediatric Hemorrhagic Stroke: A Systematic Review "Chowdhury SS, See AP, Eriksson LP, Boulouis G, Lehman LL, Hararr DB, Zabih V, Dlamini N, Fox C, Waak M." *Semin Pediatr Neurol*. 2022 Oct;43:101001. doi: 10.1016/j.spen.2022.101001. Epub 2022 Sep 19. Chowdhury SS *Semin Pediatr Neurol* 2022 10.1016/j.spen.2022.101001
17. Fractal analysis of healthy and diseased vasculature in pediatric Moyamoya disease "Weber DS, Huang KT, See AP." *Interv Neuroradiol*. 2023 Jan 26:15910199231152513. doi: 10.1177/15910199231152513. Online ahead of print. Weber DS *Interv Neuroradiol* 2023;10.1177/15910199231152513
18. Pediatric Moyamoya Syndrome Secondary to Tuberculous Meningitis: A Case Report "Kappel AD, Lehman LL, Northam WT, See AP, Smith ER." *Neurol Clin Pract*. 2023 Feb;13(1):e200121. doi: 10.1212/CPJ.0000000000200121. Epub 2023 Jan 18. Kappel AD *Neurol Clin Pract* 2023;10.1212/CPJ.0000000000200121
19. A persistent trigeminal artery demonstrates cerebrovascular embryologic development "Bram R, Choi JL, See AP, Atwal GS." *Surg Neurol Int*. 2023 Feb 3;14:40. doi: 10.25259/SNI_950_2022. eCollection 2023. Bram R *Surg Neurol Int* 2023 10.25259/SNI_950_2022
20. The composition of landmark vein of Galen malformation research: the emergence of endovascular treatments "Lu VM, Luther EM, Silva MA, Rangwala SD, Starke RM, Smith ER, See AP." *Childs Nerv Syst*. 2023 Mar;39(3):733-741. doi: 10.1007/s00381-022-05687-1. Epub 2022 Sep 23. Lu VM *Childs Nerv Syst* 2023 10.1007/s00381-022-05687-1
21. Morning glory disc anomaly and its implications in moyamoya arteriopathy: a retrospective case series "See AP, LoPresti MA, Treiber J, Thomas B, Karsten MB, Riordan CP, Scott RM, Lam SK, Smith ER." *J Neurosurg Pediatr*. 2023 Mar 17:1-7. doi: 10.3171/2023.2.PEDS22470. Online ahead of print. See AP *J Neurosurg Pediatr* 2023 10.3171/2023.2.PEDS22470
22. Genetic dysregulation of an endothelial Ras signaling network in vein of Galen malformations "Zhao S, Mekbib KY, van der Ent MA, Allington G, Prendergast A, Chau JE, Smith H, Shohfi J, Ocken J, Duran D, Furey CG, Le HT, Duy PQ, Reeves BC, Zhang J, Nelson-Williams C, Chen D, Li B, Nottoli T, Bai S, Rolle M, Zeng X, Dong W, Fu PY, Wang YC, Mane S, Piwowarczyk P, Fehnel KP, See AP, Iskandar BJ, Aagaard-Kienitz B, Kundishora AJ, DeSpensa T, Greenberg ABW, Kidanemariam SM, Hale AT, Johnston JM, Jackson EM, Storm PB, Lang SS, Butler WE, Carter BS, Chapman P, Stapleton CJ, Patel AB, Rodesch G, Smajda S, Berenstein A, Barak T, Erson-Omay EZ, Zhao H, Moreno-De-Luca A, Proctor MR, Smith ER, Orbach DB, Alper SL, Nicolli S, Boggon TJ, Lifton RP, Gunel M, King PD, Jin SC, Kahle KT." *bioRxiv*. 2023 Mar 21:2023.03.18.532837. doi: 10.1101/2023.03.18.532837. Preprint. Zhao S *bioRxiv* 2023 10.1101/2023.03.18.532837
23. SUMO therapeutics for Ischemic Stroke "Karandikar P, Gerstl JVE, Kappel AD, Won SY, Dubinski D, Garcia-Segura ME, Gessler FA, See AP, Peruzzotti-Jametti L, Bernstock JD." *Pharmaceuticals (Basel)*. 2023 Apr 29;16(5):673. doi: 10.3390/ph16050673. Karandikar P *Pharmaceuticals (Basel)* 2023 10.3390/ph16050673
24. Letter: Middle Meningeal Artery Embolization for Primary Treatment of a Chronic Subdural Hematoma in a Pediatric Patient: A Systematic Review of the Literature and Case Report "Lu VM, Rangwala SD, See AP." *Oper Neurosurg (Hagerstown)*. 2023 May 1;24(5):e385-e386. doi: 10.1227/ons.0000000000000659. Epub 2023 Feb 20. Lu VM *Oper Neurosurg (Hagerstown)* 2023 10.1227/ons.0000000000000659
25. External validation of the R2eD AVM scoring system to assess rupture risk in pediatric AVM patients "Rangwala SD, Albanese JS, Slingerland AL, Papadakis JE, Weber DS, Smith ER, Scott RM, See AP." *J Neurosurg Pediatr*. 2023 Feb 24;31(5):469-475. doi: 10.3171/2023.1.PEDS22310. Print 2023 May 1. Rangwala SD *J Neurosurg Pediatr* 2023 10.3171/2023.1.PEDS22310
26. Letter: Wide Arterial Sparing Encephalo-Duro-Syngangiosis for Moyamoya: Surgical Technique and Outcomes "See AP, Smith ER, Scott RM." *Oper Neurosurg (Hagerstown)*. 2023 May 1;24(5):e391. doi: 10.1227/ons.0000000000000681. Epub 2023 Mar 15. See AP *Oper Neurosurg (Hagerstown)* 2023 10.1227/ons.0000000000000681
27. Understanding development of jugular bulb stenosis in vein of Galen malformations: identifying metrics of complex flow dynamics in the cerebral venous vasculature of infants "Hadad S, Rangwala SD, Stout JN, Mut F, Orbach DB, Cebal JR, See AP." *Front Physiol*. 2023 May 10;14:1113034. doi: 10.3389/fphys.2023.1113034. eCollection 2023. Hadad S *Front Physiol* 2023 10.3389/fphys.2023.1113034
28. Surgical considerations for spinal epidural hemaoma evacuation in the setting of blue rubber bleb nevus syndrome in a child "Lu VM, Luiselli GA, Parker T, Klinger NV, Sadegh C, See AP." *Childs Nerv Syst*. 2023 Jun;39(6):1691-1694. doi: 10.1007/s00381-023-05843-1. Epub 2023 Mar 2. Lu VM *Childs Nerv Syst* 2023 10.1007/s00381-023-05843-1
29. Diffusion-Weighted Magnetic Resonance Imaging Demonstrates White Matter Alterations in Watershed Regions in Children With Moyamoya Without Stroke or Silent Infarct "Ahtam B, Solti M, Doo JM, Feldman HA, Vyas R, Zhang F, O'Donnell LJ, Rathi Y, Smith ER, Orbach D, See AP, Grant PE, Lehman LL." *Pediatr Neurol*. 2023 Jun;143:89-94. doi: 10.1016/j.pediatrneurol.2023.03.005. Epub 2023 Mar 16. Ahtam B *Pediatr Neurol* 2023 10.1016/j.pediatrneurol.2023.03.005

30. Focal drug-resistant temporal lobe epilepsy associated with an ipsilateral anterior choroidal artery aneurysm: illustrative case "Phillips HW, Rangwala SD, Papadakis J, Segar DJ, Tsuboyama M, Pinto ALR, Harmon JP, Soriano SG, Munoz CJ, Madsen JR, See AP, Stone SS." *J Neurosurg Case Lessons*. 2023 Jun 26;5(26):CASE23156. doi: 10.3171/CASE23156. Print 2023 Jun 26. Phillips HW *J Neurosurg Case Lessons* 2023 10.3171/CASE23156
31. Neurosurgical outcomes of pediatric cerebral venous sinus thrombosis following acute mastoiditis: a systematic review and meta-analysis "Lu VM, Abou-Al-Shaar H, Rangwala SD, Kappel AD, Lehman LL, Orbach DB, See AP." *J Neurosurg Pediatr*. 2023 Apr 14;32(1):60-68. doi: 10.3171/2023.2.PEDS2319. Print 2023 Jul 1. Lu VM *J Neurosurg Pediatr* 2023 10.3171/2023.2.PEDS2319
32. Evolution of clinical and translational advances in the management of pediatric arteriovenous malformations"See AP, Smith ER." *Childs Nerv Syst*. 2023 Jul 18. doi: 10.1007/s00381-023-06077-x. Online ahead of print. See AP *Childs Nerv Syst* 2023 10.1007/s00381-023-06077-x
33. Cerebrovascular reserve in moyamoya requires more standardization: editorial on ASL-MRI guided evaluation of multiple burr hole revascularization surgery in moyamoya disease "See AP, Stout JN." *Acta Neurochir (Wien)*. 2023 Aug;165(8):2071-2072. doi: 10.1007/s00701-023-05646-y. Epub 2023 May 23. See AP *Acta Neurochir (Wien)* 2023 10.1007/s00701-023-05646-y
34. Slingerland AL, Papadakis JE, Staffa SJ, Scott RM, See AP, Orbach DB, Fehnel KP. Management of Choroid Plexus Tumors and the Benefit of Preoperative Embolization in Pediatric Patients: Report of 46 Cases from a Single Institution. *World Neurosurg*. 2024 Jan;181. doi: 10.1016/j.wneu.2023.11.044. Epub 2023 Nov 17. PMID: 37977483.
35. Judge J, Kappel AD, Isibor C, O'Hara JE, Larson A, Kleinman M, See AP, Lehman LL, Smith ER. Prevention of postoperative stroke in pediatric moyamoya patients: a standardized perioperative care protocol. *J Neurosurg Pediatr*. 2023 Nov 17;33(2):185-189. doi: 10.3171/2023.9.PEDS23313. PMID: 37976515.
36. Slingerland AL, Keusch DS, Lehman LL, Smith ER, Srivastava S, See AP. Yield of genetic evaluation in non-syndromic pediatric moyamoya patients. *Childs Nerv Syst*. 2024 Mar;40(3):801-808. doi: 10.1007/s00381-023-06167-w. Epub 2023 Oct 1. PMID: 37778001.
37. Montaser A, Kappel AD, Driscoll J, Day E, Karsten M, See AP, Orbach DB, Smith ER. Posterior cerebral territory ischemia in pediatric moyamoya: Surgical techniques and long-term clinical and radiographic outcomes. *Childs Nerv Syst*. 2024 Mar;40(3):791-800. doi: 10.1007/s00381-023-06219-1. Epub 2023 Nov 13. PMID: 37955716.
38. Gupta S, Hauser BM, Catapano JS, Farhadi D, Ng PR, Bernstock JD, See AP, Lawton MT, Smith ER, Du R. Rupture risk and outcomes of giant aneurysms in pediatric patients: a multi-institutional case series and systematic review. *J Neurosurg Pediatr*. 2023 Dec 29;33(3):276-284. doi: 10.3171/2023.10.PEDS23296. PMID: 38157537; PMCID: PMC10932817.
39. Kappel AD, Jha R, Guggilapu S, Smith WJ, Feroze AH, Dmytriw AA, Vicenty-Padilla J, Alcedo Guardia RE, Gessler FA, Patel NJ, Du R, See AP, Peruzzi PP, Aziz-Sultan MA, Bernstock JD. Endovascular Applications for the Management of High-Grade Gliomas in the Modern Era. *Cancers (Basel)*. 2024 Apr 22;16(8):1594. doi: 10.3390/cancers16081594. PMID: 38672676; PMCID: PMC11049132.
40. See AP, Smith ER. Management of Pediatric Intracranial Arteriovenous Malformations. *J Korean Neurosurg Soc*. 2024 May;67(3):289-298. doi: 10.3340/jkns.2024.0027. Epub 2024 Mar 4. PMID: 38433517; PMCID: PMC11079567.
41. Huang KT, Mehta NH, Gupta S, See AP, Arnaout O. Evaluation of the safety, accuracy, and helpfulness of the GPT-4.0 Large Language Model in neurosurgery. *J Clin Neurosci*. 2024 May;123:151-156. doi: 10.1016/j.jocn.2024.03.021. Epub 2024 Apr 4. PMID: 38574687.
42. Hartman E, Balkin DM, See AP. A Review of the Current State and Future Directions for Management of Scalp and Facial Vascular Malformations. *J Korean Neurosurg Soc*. 2024 May;67(3):315-325. doi: 10.3340/jkns.2024.0032. Epub 2024 May 1. PMID: 38720545; PMCID: PMC11079557.
43. Oushy S, Garton A, Orbach DB, See AP. Low-profile mechanical thrombectomy devices for large vessel occlusion in pediatric ischemic stroke. *J Neurointerv Surg*. 2024 May 6
44. . doi: 10.1136/jnis-2024-021574. Epub ahead of print. PMID: 38719443.
45. Papadakis JE, Slingerland AL, Rangwala SD, Proctor MR, Shah AS, See AP. Optic Nerve Edema in Pediatric Middle Cranial Fossa Arachnoid Cysts: Report of 51 Patients From a Single Institution. *Pediatr Neurol*. 2024 Jul;156:182-190. doi: 10.1016/j.pediatrneurol.2024.04.008. Epub 2024 Apr 13. PMID: 38788281.
46. Enriquez-Marulanda A, Ramirez-Velandia F, Young M, Stout JN, See AP, Ogilvy CS, Taussky P. The evolution and future directions of bypass surgery. *J Neurosurg*. 2024 Aug 2:1-12. doi: 10.3171/2024.4.JNS2419. Epub ahead of print. PMID: 39094198.
47. Alwakaa O, Enriquez-Marulanda A, Ramirez-Velandia F, Filo J, Mensah E, Wadhwa A, Fodor TB, Pettersson SD, McNeil EP, Young M, Muram S, See AP, Granstein JH, Taussky P, Ogilvy CS. Characterizing Revascularization After Encephalo-Duro-Arterio-Synangiosis (EDAS) in Adult Patients With Moyamoya Disease Using the Orbital Grading System. *World Neurosurg*. 2024 Sep 10
48. (24)01570-5. doi: 10.1016/j.wneu.2024.09.026. Epub ahead of print. PMID: 39265938.
49. Stout JN, See AP, Meadows J, Rangwala SD, Orbach DB. Comparing Vascular Morphology and Hemodynamics in Patients with Vein of Galen Malformations Using Intracranial 4D Flow MRI. *AJNR Am J Neuroradiol*. 2024 Oct 3;45(10):1586-1592. doi: 10.3174/ajnr.A8353. PMID: 38789120; PMCID: PMC11448974.
50. Ahtam B, Julie M, Berto LF, Lildharrie C, Solti M, Doo JM, Feldman HA, Vyas R, Zhang F, O'Donnell LJ, Rathi Y, Stout J, Smith ER, Orbach DB, See AP, Grant PE, Lehman LL. Symptoms Do Not Predict White Matter Injury in the Watershed Regions in Children with Moyamoya. *J Pediatr*. 2024 Oct 18:114372. doi: 10.1016/j.jpeds.2024.114372. Epub ahead of print. PMID: 39428090.





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PUBLICATIONS

1. Pinard A, Guey S, Guo D, [...] Smith ER [...] The pleiotropy associated with de novo variants in CHD4, CNOT3, and SETD5 extends to moyamoya angiopathy. *Genet Med.* 2020;22(2):427-431. doi:10.1038/s41436-019-0639-2
2. Fehnel KP, Penn DL, Duggins-Warf M [...] Smith ER. Dysregulation of the EphrinB2-EphB4 ratio in pediatric cerebral arteriovenous malformations is associated with endothelial cell dysfunction in vitro and functions as a novel noninvasive biomarker in patients. *Exp Mol Med.* 2020;52(4):658-671. doi:10.1038/s12276-020-0414-0
3. Verhofste BP, Davis EA, Miller PE, [...] Smith ER, Proctor MR [...] Chiari I malformations with syringomyelia: long-term results of neurosurgical decompression. *Spine Deform.* 2020;8(2):233-243. doi:10.1007/s43390-019-00009-z
4. Bolar D, Gagoski B, Orbach DB, Smith ER, Adalsteinsson E, Rosen BR, Grant PE, Robertson RL, Comparison of CBF measured with velocity selective ASL and pulsed ASL to blood flow patterns assessed by conventional angiography in pediatric moyamoya, *American Journal of Neuroradiology*, 2019 Nov;40(11):1842-1849.
5. Goss JA, Huang AY, Smith E, Konczyk DJ, Smits PJ, Sudduth CL, Stapleton C, Patel A, Alexandrescu S, Warman ML, Greene AK. Somatic mutations in intracranial arteriovenous malformations. *PLoS One.* 2019 Dec 31;14(12):
6. Scott RM, Smith ER. Transition to adulthood for pediatric moyamoya patients. *Pediatr Neurol DOI* <https://doi.org/10.1055/s-0040-1715500>.
7. Montaser A, Smith ER, Moyamoya Disease, *Practical Neurology*, 2020, Jan p. 2-8
8. Day EL, Smith ER, Fehnel KP. Single-institution case series of pituitary biopsy for suspected germinoma in the pediatric population: diagnostic utility, operative risks, and biopsy approaches. *Sci Rep.* 2020 Sep 17;10(1):15257. doi: 10.1038/s41598-020-71988-7. PMID: 32943645.
9. Pinard A, Guey S, Guo D, [...] Smith ER [...] The pleiotropy associated with de novo variants in CHD4, CNOT3, and SETD5 extends to moyamoya angiopathy. *Genet Med.* 2020;22(2):427-431. doi:10.1038/s41436-019-0639-2
10. Fehnel KP, Penn DL, Duggins-Warf M [...] Smith ER. Dysregulation of the EphrinB2-EphB4 ratio in pediatric cerebral arteriovenous malformations is associated with endothelial cell dysfunction in vitro and functions as a novel noninvasive biomarker in patients. *Exp Mol Med.* 2020;52(4):658-671. doi:10.1038/s12276-020-0414-0
11. Verhofste BP, Davis EA, Miller PE, [...] Smith ER, Proctor MR [...] Chiari I malformations with syringomyelia: long-term results of neurosurgical decompression. *Spine Deform.* 2020;8(2):233-243. doi:10.1007/s43390-019-00009-z
12. Bolar D, Gagoski B, Orbach DB, Smith ER, Adalsteinsson E, Rosen BR, Grant PE, Robertson RL, Comparison of CBF measured with velocity selective ASL and pulsed ASL to blood flow patterns assessed by conventional angiography in pediatric moyamoya, *American Journal of Neuroradiology*, 2019 Nov;40(11):1842-1849.
13. Goss JA, Huang AY, Smith E, Konczyk DJ, Smits PJ, Sudduth CL, Stapleton C, Patel A, Alexandrescu S, Warman ML, Greene AK. Somatic mutations in intracranial arteriovenous malformations. *PLoS One.* 2019 Dec 31;14(12):
14. Scott RM, Smith ER. Transition to adulthood for pediatric moyamoya patients. *Pediatr Neurol DOI* <https://doi.org/10.1055/s-0040-1715500>.
15. Montaser A, Smith ER, Moyamoya Disease, *Practical Neurology*, 2020, Jan p. 2-8
16. Day EL, Smith ER, Fehnel KP. Single-institution case series of pituitary biopsy for suspected germinoma in the pediatric population: diagnostic utility, operative risks, and biopsy approaches. *Sci Rep.* 2020 Sep 17;10(1):15257. doi: 10.1038/s41598-020-71988-7. PMID: 32943645.
17. Sesen J, Driscoll J, Moses-Gardner A, Orbach DB, Zurakowski D, Smith ER. Non-invasive Urinary Biomarkers in Moyamoya Disease. *Front Neurol.* 2021 Apr 1;12:661952. doi: 10.3389/fneur.2021.661952. PMID: 33868159; PMCID: PMC8047329.
18. O'Neill NP, Miller PE, Hresko MT, Emans JB, Karlin LI, Hedequist DJ, Snyder BD, Smith ER, Proctor MR, Glotzbecker MP. Scoliosis with Chiari I malformation without associated syringomyelia. *Spine Deform.* 2021 Jan 20. doi: 10.1007/s43390-021-00286-7.
19. Lehman LL, Bruccoleri R, Danehy A, Swanson J, Mrakotsky C, Smith E, Orbach DB, Burstein R. Adverse effects of ocrelizumab on cerebral proliferative angiopathy. *Cephalalgia.* 2021 Jan;41(1):122-126. doi: 10.1177/0333102420950484.
20. Lauer A, Speroni SL, Patel JB, Regalado E, Choi M, Smith E, Kalpathy-Kramer J, Caruso P, Milewicz DM, Musolino PL., Cerebrovascular Disease Progression in Patients With ACTA2 Arg179 Pathogenic Variants, *Neurology.* 2021 Jan 26;96(4):e538-e552. doi: 10.1212/WNL.0000000000011210.
21. Fouda MA, Day EL, Scott RM, Smith ER, Marcus KJ, Fehnel KP, Predictors of progression in radiation-induced vs non-radiation-induced pediatric meningiomas: A large single institutional surgical experience. *Journal of Neurosurgery, Pediatrics* 2021 Jun 11:1-7. doi: 10.3171/2021.1.PEDS20819.
22. Karsten MB, Smith ER, Scott RM, Late morbidity and mortality in the operated pediatric moyamoya population, *Journal of Neurosurgery, Pediatrics* 2021 Jun 11:1-6. doi: 10.3171/2021.1.PEDS20944.
23. Srinivasan HL, Hausman-Kedem M, Smith ER, Constantini S, Roth J, Current trends in Pediatric Moyamoya: A Survey of International Practitioners, *Childs Nerv Syst.* 2021 Jun;37(6):2011-2023. doi: 10.1007/s00381-021-05074-2.
24. Sesen J, Driscoll J, Moses-Gardner A, Orbach DB, Zurakowski D, Smith ER, Non-invasive Urinary Biomarkers in Moyamoya, *Front Neurol.* 2021 Apr 1;12:661952. doi: 10.3389/fneur.2021.661952.

25. Kundishora AJ, Peters S, Pinard A, Duran D, Panchagnua S, Barak T, Miyagishima DF, Dong W, Dunbar A, Smith H, Ocken J, Nelson-Williams C, Haider S, Walker R, Li B, Zhao H, Thumkeo D, Marlier A, Duy PQ, Diab NS, Reeves BC, Sujjantararat N, Srtatman AN, Chen Y, Zhao S, Roszko I, Lu Q, Zhang B, Mane S, Castaldi C, Lopez-Giraldez F, Knight JR, Bamshad MJ, Nickerson DA, Geschwind DH, Chen SL, Storm PB, Matouk C, Alper SL, Smith ER, Lifton RP, Gunel M, Milewicz DM, Jin SC, Kahle KT, DIAPH1 mutations in sporadic moyamoya disease implicate impaired vascular cell actin remodeling in disease pathogenesis, *JAMA Neurology*, 2021 Aug 1;78(8):993-1003. doi: 10.1001/jamaneurol.2021.1681.
26. Lauer A, Speroni S, Patel J, Regalado E, Choi Myoung, Smith ER, Kalpathy-Kramer J, Caruso P, Milewicz D, Musolino P, Cerebrovascular disease progression in patients with ACTA2 Arg179 pathogenic materials, Dryad, Dataset, dryad.5x69p8d1f. variants supplementary <https://doi.org/10.5061/>
27. Montaser A, Driscoll J, Smith H, Karsten MB, Day E, Mounlavongsy T, Orbach DB, Smith ER., Long-term clinical and radiographic outcomes after pial pericranial dural revascularization: a hybrid surgical technique for treatment of anterior cerebral territory ischemia in pediatric moyamoya disease, *J Neurosurg Pediatr*. 2021 Jul 2;1-9. doi: 10.3171/2021.2.PEDS20743.
28. Montaser A, Smith ER. Intracranial Vascular Abnormalities in Children. *Pediatr Clin North Am*. 2021 Aug;68(4):825-843. doi: 10.1016/j.pcl.2021.04.010. PMID: 34247712.
29. Smith ER, Lanzino G, Steinberg GK, Xu B. Introduction. Translational research advances in the evaluation and management of moyamoya disease. *Neurosurg Focus*. 2021 Sep;51(3):E1. doi: 10.3171/2021.6.FOCUS21373. PMID: 34469864.
30. Smith ER, Growing research: How neurosurgeons can lead the development of nonsurgical treatments for moyamoya disease, *Neurosurg Focus* 2021 Sep;51(3):E10. doi: 10.3171/2021.6.FOCUS21374.
31. Lehman LL, Brucocoleri R, Danehy A, Swanson J, Mrakotsky C, Smith E, Orbach DB, Burstein R. Adverse effects of erenumab on cerebral proliferative angiopathy: A case report. *Cephalalgia*. 2021 Jan;41(1):122-126. doi: 10.1177/0333102420950484. Epub 2020 Aug 19. PMID: 32814432.
32. 32814432.
33. Lauer A, Speroni SL, Patel JB, Regalado E, Choi M, Smith E, Kalpathy-Kramer J, Caruso P, Milewicz DM, Musolino PL., Cerebrovascular Disease Progression in Patients With ACTA2 Arg179 Pathogenic Variants, *Neurology*. 2021 Jan 26;96(4):e538-e552. doi: 10.1212/WNL.00000000000011210.
34. Montaser A, Driscoll J, Smith H, Karsten MB, Day E, Mounlavongsy T, Orbach DB, Smith ER. Long-term clinical and radiographic outcomes after pial pericranial dural revascularization: a hybrid surgical technique for treatment of anterior cerebral territory ischemia in pediatric moyamoya disease. *J Neurosurg Pediatr*. 2021 Jul 2:1-9. doi: 10.3171/2021.2.PEDS20743. Epub ahead of print. PMID: 34214976.
35. Montaser AS, Lalgudi Srinivasan H, Staffa SJ, Zurakowski D, Slingerland AL, Orbach DB, Hausman-Kedem M, Roth J, Smith ER. Ivy sign: a diagnostic and prognostic biomarker for pediatric moyamoya. *J Neurosurg Pediatr*. 2021 Dec 31:1-9. doi: 10.3171/2021.11.PEDS21384. Epub ahead of print. PMID: 34972077.
36. 57. Smith ER. Editoria. A terrible border wall: a study of pediatric moyamoya exposes socioeconomic barriers to care in the United States. *J Neurosurg Pediatr*. 2022 Mar 25:1-2. doi: 10.3171/2022.1.PEDS226. Epub ahead of print. PMID: 35334458
37. Alomari MH, Shahin MM, Fishman SJ, Kerr CL, Smith ER, Eng W, Ruiz-Gutierrez M, Adams DM, Orbach DB, Chaudry G, Shaikh R, Chewing R, Alomari AI. Cerebrospinal fluid leak in epidural venous malformations and blue rubber bleb nevus syndrome. *J Neurosurg Spine*. 2022 Apr 1:1-7. doi: 10.3171/2022.1.SPINE2138. Epub ahead of print. PMID: 35364593.
38. 58. Slingerland AL, Karsten MB, Smith ER, Sobota AE, See AP. Two Sides of a Coin: Case Report of Unilateral Synangiosis and Contralateral Stroke Highlighting Consequences of Disease Progression and Efficacy of Revascularization in Sickle Cell Disease Associated Moyamoya Syndrome. *Acta Haematol*. 2021 Dec 8. doi: 10.1159/000521361. Epub ahead of print. PMID: 34879377.
39. Zimmerman A, Monteiro W, Nickenig Vissoci JR, Smith ER, Rocha T, Sachett J, Wen FH, Staton C, Gerardo CJ, Ogbuaji O. Scaling up antivenom for snakebite envenoming in the Brazilian Amazon: a cost-effectiveness analysis. *Lancet Reg Health Am*. 2023 Dec 14;29:100651. doi: 10.1016/j.lana.2023.100651. PMID: 38124996; PMID: PMC10733094.
40. Smith ER, Theodorakis PE. Multiscale simulation of fluids: coupling molecular and continuum. *Phys Chem Chem Phys*. 2024 Jan 3;26(2):724-744. doi: 10.1039/d3cp03579d. PMID: 38113114.
41. Xu AP, Xu LB, Smith ER, Fleishman JS, Chen ZS, Xu XX. Cell death in cancer chemotherapy using taxanes. *Front Pharmacol*. 2024 Jan 5;14:1338633. doi: 10.3389/fphar.2023.1338633. PMID: 38249350; PMID: PMC10796453.
42. Hazel EA, Erchick DJ, Katz J, Lee ACC, Diaz M, Wu LSF, West KP Jr, Shamim AA, Christian P, Ali H, Baqui AH, Saha SK, Ahmed S, Roy AD, Silveira MF, Buffarini R, Shapiro R, Zash R, Kolsteren P, Lachat C, Huybregts L, Roberfroid D, Zhu Z, Zeng L, Gebreyesus SH, Tesfamariam K, Adu-Afarwuah S, Dewey KG, Gyaase S, Poku-Asante K, Boamah Kaali E, Jack D, Ravilla T, Tielsch J, Taneja S, Chowdhury R, Ashorn P, Maleta K, Ashorn U, Mangani C, Mullany LC, Khatry SK, Ramokolo V, Zembe-Mkabile W, Fawzi WW, Wang D, Schmiegelow C, Minja D, Msemo OA, Lusingu JPA, Smith ER, Masanja H, Mongkolchat A, Keentupthai P, Kakuru A, Kajubi R, Semrau K, Hamer DH, Manasyan A, Pry JM, Chasekwa B, Humphrey J, Black RE. Neonatal mortality risk of vulnerable newborns by fine stratum of gestational age and birthweight for 230 679 live births in nine low- and middle-income countries, 2000-2017. *BJOG*. 2024 Jan 16. doi: 10.1111/1471-0528.17743. Epub ahead of print. PMID: 38228570.
43. Smith ER, Espinoza P, Metcalf M, Ogbuaji O, Cotache-Condor C, Rice HE, Shrimme MG. Modeling the global impact of reducing out-of-pocket costs for children's surgical care. *PLOS Glob Public Health*. 2024 Jan 26;4(1). doi: 10.1371/journal.pgph.0002872. PMID: 38277421; PMID: PMC10817198.
44. Rahnavard A, Chatterjee R, Wen H, Gaylord C, Mugusi S, Klatt KC, Smith ER. Molecular epidemiology of pregnancy using omics data: advances, success stories, and challenges. *J Transl Med*. 2024 Jan 26;22(1):106. doi: 10.1186/s12967-024-04876-7. PMID: 38279125; PMID: PMC10821542.
45. Smith ER, Frye CC, Pandian TK, Gillanders WE, Olson JA, Brown TC, Jasim S. Molecular characteristics of isthmus papillary thyroid cancers: Supporting evidence for unfavorable clinical behavior. *Am J Surg*. 2024 Feb;228:146-150. doi: 10.1016/j.amjsurg.2023.09.005. Epub 2023 Sep 21. PMID: 37805303.
46. Judge J, Kappel AD, Isibor C, O'Hara JE, Larson A, Kleinman M, See AP, Lehman LL, Smith ER. Prevention of postoperative stroke in pediatric moyamoya patients: a standardized perioperative care protocol. *J Neurosurg Pediatr*. 2023 Nov 17;33(2):185-189. doi: 10.3171/2023.9.PEDS23313. PMID: 37976515.
47. Farooq F, Smith ER, Pan Q, Glass Baumann S, Akelo V, Jehan F, Kasaro M, Nisar I, Ouma G, Vwalika B, Spelke MB, Price JT, Hoodbhoy Z. Comparison of Masimo Total Hemoglobin SpHb® continuous non-invasive hemoglobin monitoring device with laboratory complete blood count measurement using venous sample: Protocol for an observational substudy of the Pregnancy Risk and Infant Surveillance and Measurement Alliance Maternal and Newborn Health (PRISMA MNH) study. *Gates Open Res*. 2024 Feb 5;7:50. doi: 10.12688/gatesopenres.14499.1. PMID: 37868333; PMID: PMC10587393.
48. Levitan B, Hadler SC, Hurst W, Izurieta HS, Smith ER, Baker NL, Bauchau V, Chandler R, Chen RT, Craig D, King J, Pitisuttithum P, Strauss W, Tomczyk S, Zafack J, Kochhar S. The Brighton collaboration standardized module for vaccine benefit-risk assessment. *Vaccine*. 2024 Feb 6;42(4):972-986. doi: 10.1016/j.vaccine.2023.09.039. Epub 2023 Dec 21. PMID: 38135642.
49. Bird ST, Smith ER, Gelperin K, Jung TH, Thompson A, Kambhampati R, Lyu H, Zhao H, Zhao Y, Zhu Y, Easley O, Niak A, Wernecke M, Chillarige Y, Zemskova M, Kelman JA, Graham DJ. Severe Hypocalcemia With Denosumab Among Older Female Dialysis-Dependent Patients. *JAMA*. 2024 Feb 13;331(6):491-499. doi: 10.1001/jama.2023.28239. PMID: 38241060; PMID: PMC10799290.
50. Mologousis MA, Balkin DM, Smith ER, Lidov HGW, Li AM, Yang E, Liang MG. Non-vascular intracranial lesions in three children with PHACE association. *Pediatr Dermatol*. 2024 Mar-Apr;41(2):284-288. doi: 10.1111/pde.15423. Epub 2023 Sep 18. PMID: 37723596.
51. Slingerland AL, Keusch DS, Lehman LL, Smith ER, Srivastava S, See AP. Yield of genetic evaluation in non-syndromic pediatric moyamoya patients. *Childs Nerv Syst*. 2024 Mar;40(3):801-808. doi: 10.1007/s00381-023-06167-w. Epub 2023 Oct 1. PMID: 37778001

52. Montaser A, Kappel AD, Driscoll J, Day E, Karsten M, See AP, Orbach DB, Smith ER. Posterior cerebral territory ischemia in pediatric moyamoya: Surgical techniques and long-term clinical and radiographic outcomes. *Childs Nerv Syst.* 2024 Mar;40(3):791-800. doi: 10.1007/s00381-023-06219-1. Epub 2023 Nov 13. PMID: 37955716.
53. Gupta S, Hauser BM, Catapano JS, Farhadi D, Ng PR, Bernstock JD, See AP, Lawton MT, Smith ER, Du R. Rupture risk and outcomes of giant aneurysms in pediatric patients: a multi-institutional case series and systematic review. *J Neurosurg Pediatr.* 2023 Dec 29;33(3):276-284. doi: 10.3171/2023.10.PEDS23296. PMID: 38157537; PMCID: PMC10932817.
54. Zadey S, Smith ER, Staton CA, Fitzgerald TN, Vissoci JRN. Population-level surgical rates and unmet need in India: a retrospective analysis of districts and states from 2011 to 2019. *Int J Surg.* 2024 Mar 1;110(3):1884-1887. doi: 10.1097/JS9.0000000000001024. PMID: 38181119; PMCID: PMC10942208.
55. Hamid AK, Pastor Arroyo EM, Calvet C, Hewitson TD, Muscalu ML, Schnitzbauer U, Smith ER, Wagner CA, Egli-Spichtig D. Phosphate Restriction Prevents Metabolic Acidosis and Curbs Rise in FGF23 and Mortality in Murine Folic Acid-Induced AKI. *J Am Soc Nephrol.* 2024 Mar 1;35(3):261-280. doi: 10.1681/ASN.0000000000000291. Epub 2024 Jan 4. PMID: 38189228; PMCID: PMC10914210.
56. Smith ER. Cavernous Malformations of the Central Nervous System. *N Engl J Med.* 2024 Mar 14;390(11):1022-1028. doi: 10.1056/NEJMra2305116. PMID: 38477989.
57. Sun LR, Jordan LC, Smith ER, Aldana PR, Kirschen MP, Williams K, Gupta N, Steinberg GK, Fox C, Harrar DB, Lee S, Chung MG, Dirks P, Dlamini N, Maher CO, Lehman LL, Hong SJ, Strahle JM, Pineda JA, Beslow LA, Rasmussen L, Mailo J, Piatt J, Lang SS, Adelson PD, Dewan MC, Mineyko A, McClugage S, Vadivelu S, Dowling MM, Hersh DS. Pediatric Moyamoya Revascularization Perioperative Care: A Modified Delphi Study. *Neurocrit Care.* 2024 Apr;40(2):587-602. doi: 10.1007/s12028-023-01788-0. Epub 2023 Jul 20. PMID: 37470933; PMCID: PMC11023720.
58. Ramai D, Smith ER, Wang Y, Huang Y, Obaitan I, Chandan S, Dhindsa B, Papaefthymiou A, Morris JD. Epidemiology and Socioeconomic Impact of Pancreatic Cancer: An Analysis of the Global Burden of Disease Study 1990-2019. *Dig Dis Sci.* 2024 Apr;69(4):1135-1142. doi: 10.1007/s10620-024-08292-1. Epub 2024 Feb 21. PMID: 38383939.
59. Hu M, Shoaibi A, Feng Y, Lloyd PC, Wong HL, Smith ER, Amend KL, Kline A, Beachler DC, Gruber JF, Mitra M, Seeger JD, Harris C, Secora A, Obidi J, Wang J, Song J, McMahon-Walraven CN, Reich C, McEvoy R, Do R, Chillarige Y, Clifford R, Cooper DD, Forshee RA, Anderson SA. Safety of Ancestral Monovalent BNT162b2, mRNA-1273, and NVX-CoV2373 COVID-19 Vaccines in US Children Aged 6 Months to 17 Years. *JAMA Netw Open.* 2024 Apr 1;7(4) doi: 10.1001/jamanetworkopen.2024.8192. PMID: 38656578; PMCID: PMC11043896.
60. . doi: 10.1001/jamanetworkopen.2024.8192. PMID: 38656578; PMCID: PMC11043896.
61. Gwanika Y, Rice HE, Metcalf M, Espinoza P, Kajoka HD, Rice HE, Staton C, Mmbaga BT, Majaliwa E, Smith ER, Cotache-Condor C. Impact of the COVID-19 pandemic in childhood and adolescent cancer care in northern Tanzania: a cross-sectional study. *BMC Cancer.* 2024 Apr 12;24(1):457. doi: 10.1186/s12885-024-12168-y. PMID: 38609910; PMCID: PMC11010397.
62. Bankole OB, Makanjuola A, Alabi EO, Odugbemi TO, Abazie O, Ademuyiwa IY, Okusanya B, Onwuka A, Smith ER, Tran T, Gupta S, Ots R, Harrison EM, Poenaru D, Elebute OA, Seyi-Olajide JO, Ladipo-Ajayi O, Alakaloko FM, Bode CO, Nwomeh BN, Ademuyiwa AO. Unmet Surgical Need among Adults in A Mixed Urban-Rural Community in Nigeria: A Survey of 1,993 Adults Using the Sosas Survey Tool. *West Afr J Med.* 2024 Apr 30;41(4):436-451. PMID: 39003518.
63. Sylvetsky AC, Hughes SA, Kuttamperoor JT, Moore HR, Murphy J, Sacheck J, Smith ER. Mothers' Experiences During the 2022 Infant Formula Shortage in Washington D.C. *Matern Child Health J.* 2024 May;28(5):873-886. doi: 10.1007/s10995-023-03860-9. Epub 2023 Dec 26. PMID: 38147276; PMCID: PMC11001681.
64. Smith ER. Pediatric Cerebral Vascular Malformations: Current and Future Perspectives. *J Korean Neurosurg Soc.* 2024 May;67(3):326-332. doi: 10.3340/jkns.2024.0011. Epub 2024 Feb 27. PMID: 38409785; PMCID: PMC11079569.
65. See AP, Smith ER. Management of Pediatric Intracranial Arteriovenous Malformations. *J Korean Neurosurg Soc.* 2024 May;67(3):289-298. doi: 10.3340/jkns.2024.0027. Epub 2024 Mar 4. PMID: 38433517; PMCID: PMC11079567.
66. Porter KE, Stein MB, Grau PP, Kim HM, Powell C, Hoge CW, Venners MR, Smith ER, Martis B, Simon NM, Liberzon I, Rauch SAM; PROGRESS Research Team. Impact of PTSD treatment on postconcussive symptoms in veterans: A comparison of sertraline, prolonged exposure, and their combination. *J Psychiatr Res.* 2024 May;173:64-70. doi: 10.1016/j.jpsychires.2024.03.011. Epub 2024 Mar 8. PMID: 38503135.
67. Abdul-Mumin A, Bimpong KA, Cotache-Condor C, Oppong J, Charadan AMS, Munkaila A, Perez de Souza JV, Smith ER. Impact of the COVID-19 pandemic on perinatal care and outcomes: A retrospective study in a tertiary hospital in Northern Ghana. *PLoS One.* 2024 May 31;19(5) doi: 10.1371/journal.pone.0301081. PMID: 38820360; PMCID: PMC11142585.
68. . doi: 10.1371/journal.pone.0301081. PMID: 38820360; PMCID: PMC11142585.
69. Caton MT, Smith ER, Baker A, Dowd CF. Super-selective cavernous sinus and inferior petrosal sinus sampling for Cushing syndrome: Technique and interpretation. *Interv Neuroradiol.* 2024 Jun;30(3):419. doi: 10.1177/15910199221099409. Epub 2022 May 2. PMID: 35499919; PMCID: PMC11310728.
70. Frye CC, Sullivan J, Sanka SA, Smith ER, Goetz B, Brunt LM, Gillanders W, Brown TC, Olson JA, Hall B, Pandian TK. Cost-Effectiveness of Parathyroid Cryopreservation and Autotransplantation. *JAMA Surg.* 2024 Jun 1;159(6):634-641. doi: 10.1001/jamasurg.2024.0175. PMID: 38506884; PMCID: PMC10955396.
71. Cejka D, Thiem U, Blinzler E, Machacek J, Voelkl J, Smith ER, Pasch A, Haller MC. Citrate-Buffered, Magnesium-Enriched Dialysate on Calcification Propensity in Hemodialysis Patients - The CitMag Study. *Kidney Int Rep.* 2024 Mar 25;9(6):1765-1773. doi: 10.1016/j.ekir.2024.03.023. PMID: 38899177; PMCID: PMC11184245.
72. Thiem U, Lenz J, Haller MC, Pasch A, Smith ER, Cejka D. The effect of parathyroid hormone lowering by etelcalcetide therapy on calcification propensity and calciprotein particles in hemodialysis patients. *Clin Kidney J.* 2024 Mar 30;17(6) doi: 10.1093/ckj/sfae097. PMID: 38919277; PMCID: PMC11197474.
73. . doi: 10.1093/ckj/sfae097. PMID: 38919277; PMCID: PMC11197474.
74. Smith ER. Cavernous Malformations of the Central Nervous System. Reply. *N Engl J Med.* 2024 Jun 6;390(21):2036. doi: 10.1056/NEJMc2404443. PMID: 38838326.
75. Shintaku M, Oga H, Kusudo H, Smith ER, Omori T, Yamaguchi Y. Measuring line tension: Thermodynamic integration during detachment of a molecular dynamics droplet. *J Chem Phys.* 2024 Jun 14;160(22):224502. doi: 10.1063/5.0201973. PMID: 38856068.
76. Beaman C, Gautam A, Peterson C, Kaneko N, Ponce L, Saber H, Khatibi K, Morales J, Kimball D, Lipovac JR, Narsinh KH, Baker A, Caton MT, Smith ER, Nour M, Szeder V, Jahan R, Colby GP, Cord BJ, Cooke DL, Tateshima S, Duckwiler G, Waldau B; Robotics Working Group; Robotic Working Group. Robotic Diagnostic Cerebral Angiography: A Multicenter Experience of 113 Patients. *J Neurointerv Surg.* 2024 Jun 17;16(7):726-730. doi: 10.1136/jnis-2023-020448. PMID: 37468266.
77. Yousef Y, Cairo S, St-Louis E, Goodman LF, Hamad DM, Baird R, Smith ER, Emil S, Laberge JM, Abdelmalak M, Gathuy Z, Evans F, Adel MG, Bertille KK, Chitnis M, Millano L, Nthumba P, d'Agostino S, Cigliano B, Zea-Salazar L, Ameh E, Ozgediz D, Guadagno E, Poenaru D. GAPS phase II: development and pilot results of the global assessment in pediatric surgery, an evidence-based pediatric surgical capacity assessment tool for low-resource settings. *Pediatr Surg Int.* 2024 Jun 19;40(1):158. doi: 10.1007/s00383-024-05741-w. PMID: 38896255.
78. Hall B, Tegge A, Cotache Condor C, Rhoads M, Wattsman TA, Witcher A, Creamer E, Tupetz A, Smith ER, Reddy Tokala M, Meier B, Rice HE. Understanding family-level decision-making when seeking access to acute surgical care for children: Protocol for a cross-sectional mixed methods study. *PLoS One.* 2024 Jun 24;19(6) doi: 10.1371/journal.pone.0304165. PMID: 38913675; PMCID: PMC11195935.
79. . doi: 10.1371/journal.pone.0304165. PMID: 38913675; PMCID: PMC11195935.
80. Sexton MB, Cochran HM, Schubert JR, Gorin HM, Paulson JL, Boyd MR, Porter KE, Smith ER. Trauma-focused therapy retention among military sexual trauma survivors: relationship with veterans' sexual or gender minority identification. *Cogn Behav Ther.* 2024 Jul;53(4):351-363. doi: 10.1080/16506073.2024.2313740. Epub 2024 Feb 6. PMID: 38317621.

81. Yang WC, Chitale R, O'Callaghan KM, Sudfeld CR, Smith ER. The Effects of Vitamin D Supplementation During Pregnancy on Maternal, Neonatal, and Infant Health: A Systematic Review and Meta-analysis. *Nutr Rev.* 2024 Jul 1

82. . doi: 10.1093/nutrit/nuae065. Epub ahead of print. PMID: 38950419.

83. Lee JS, Storey A, Lanpher A, Smith ER. Development of moyamoya arteriopathy following treatment of intracranial tumors: clinical and radiographic characterization. *J Neurosurg Pediatr.* 2024 May 3;34(2):163-168. doi: 10.3171/2024.3.PEDS23479. PMID: 38701520.

81. Brandel MG, Gonzalez H, Gonda DD, Levy ML, Smith ER, Lam SK, Couldwell WT, Steinberg J, Ravindra VM. Examining barriers to care: a retrospective cohort analysis investigating the relationship between hospital volume and outcomes in pediatric patients with cerebral arteriovenous malformations. *J Neurosurg Pediatr.* 2024 May 24;34(2):153-162. doi: 10.3171/2024.3.PEDS23534. PMID: 38788230.

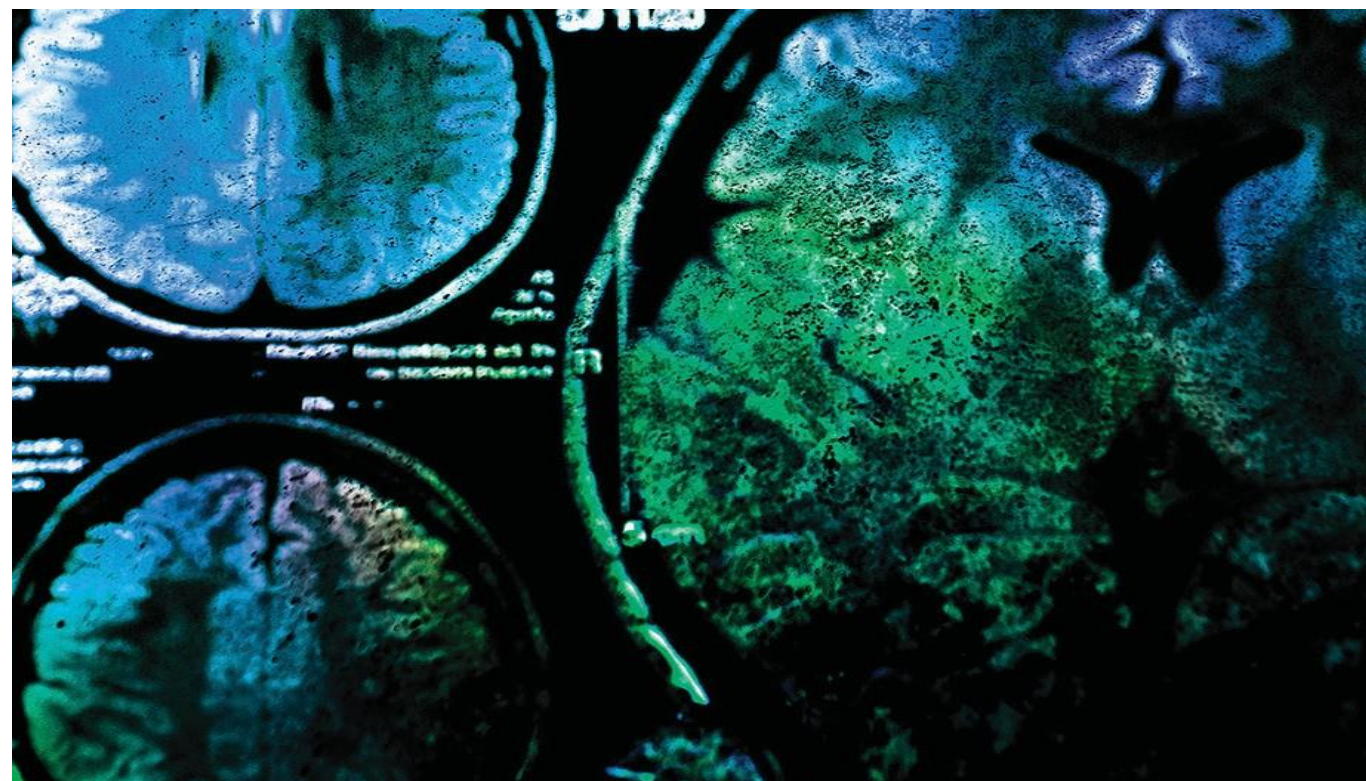
82. Feenstra L, Reijrink M, Pasch A, Smith ER, Visser LM, Bulthuis M, Lodewijk ME, Mastik MF, Greuter MJW,

Slart RHJA, Mulder DJ, Pol RA, Te Velde-Keyzer CA; TransplantLines Investigators; Krenning G, Hillebrands JL. Calciprotein particle counts associate with vascular remodeling in chronic kidney disease. *Cardiovasc Res.* 2024 Aug 5

83. . doi: 10.1093/cvr/cvae164. Epub ahead of print. PMID: 39102822.

84. Smith ER, Alayande B, Ameh EA, Seyi-Olajide JO, Cotache-Condor C, Espinoza P, Metcalf M, Staton C, Bekele A, Bundy D, Rice HE, Bickler S. Surgical care is critical for advancing adolescent health in low and middle-income countries. *World J Surg.* 2024 Aug 7. doi: 10.1002/wjs.12313. Epub ahead of print. PMID: 39112440.

85. Ciulei MA, Smith ER, Perumal N, Jakazi CS, Sudfeld CR, Gernand AD. Corrigendum to 'Nutritious Supplemental Foods for Pregnant Women from Food Insecure Settings: Types, Nutritional Composition, and Relationships to Health Outcomes' [*Curr. Dev. Nutr.* 7 (2023) 100094]. *Curr Dev Nutr.* 2024 Aug 9;8(8):104433. doi: 10.1016/j.cdnut.2024.104433. Erratum for: *Curr Dev Nutr.* 2023 Apr 28;7(6):100094. doi: 10.1016/j.cdnut.2023.100094. PMID: 39281426; PMCID: PMC11401459.



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PUBLICATIONS

1. Sun, Y., Dhamne, S.C., Carretero-Guillén, A., Salvador, R., Goldenberg, M.C., Godlewski, B.R., Pascual-Leone, A., Madsen, J.R., Stone, S.S., Ruffini, G., Márquez-Ruiz, J. and Rotenberg, (2020), Drug-responsive inhomogeneous cortical modulation by direct current stimulation. *Ann Neurol.* Accepted Author Manuscript. doi:10.1002/ana.25822

2. Bernstock, JD; Tafel, I; Segar, DJ; ... Aglan, O; Montaser, A; Gupta, S; Johnston, B; Judge, J; Fehnel, K; Stone, S.S; Warf, B.C. Complex Management of Hydrocephalus Secondary To Choroid Plexus Hyperplasia, *World Neurosurgery*, 2020, ISSN 1878-8750. <https://doi.org/10.1016/j.wneu.2020.05.211>

3. Nolan JG, Vestal M, Stone S, Dagi LR. "Plugged In". *Orbit.*2020;39(1):73-74. doi:10.1080/01676830.2019.1576742

4. Peters JM, Hyde DE, Chu CJ, [...] Madsen J, Stone SS [...]. Lesion-Constrained Electrical Source Imaging: A Novel Approach in Epilepsy Surgery for Tuberous Sclerosis Complex. *J Clin Neurophysiol.* 2020;37(1):79-86. doi:10.1097/WNP.0000000000000615

5. Grayson, L; Peters, J; Stone, S.S; Madsen, J.R; [...] Pilot Study of Neurodevelopmental Impact of Early Epilepsy Surgery in Tuberous Sclerosis Complex, *Pediatric Neurology*, (2020). <https://doi.org/10.1016/j.pediatrneurol.2020.04.002>.

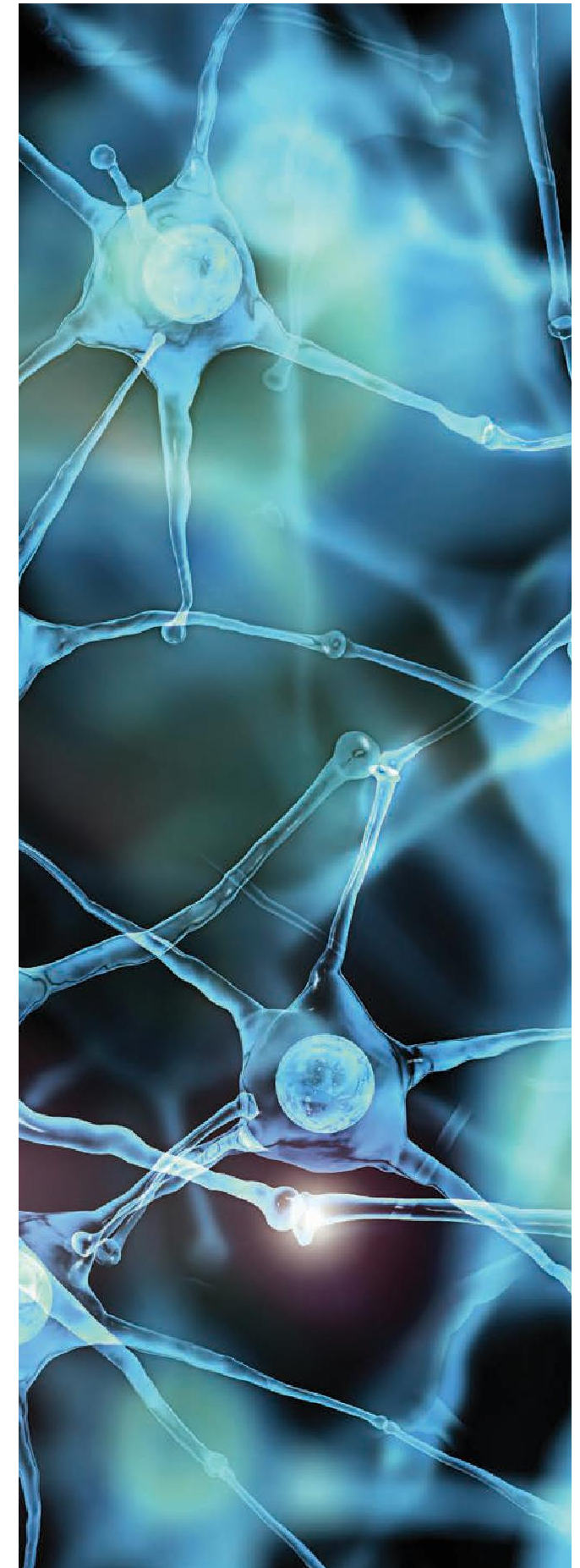
6. Levin, D.N., McClain, C.D., Stone, S.S., Madsen, J.R. and Soriano, S. (2020), Anesthetic Management and Outcomes For MRI-Guided Laser Interstitial Thermal Therapy (LITT) For Seizure Focus in Pediatrics: A Single Centre Experience With 10 Consecutive Patients. *Pediatr Anaesth.* Accepted Author Manuscript. doi:10.1111/pan.13929

7. Sun Y, Dhamne SC, Carretero-Guillén A [...] Madsen JR, Stone SS [...]Drug-Responsive Inhomogeneous Cortical Modulation by Direct Current Stimulation [published online ahead of print, 2020 Jun 15]. *Ann Neurol.* 2020;10.1002/ana.25822. doi:10.1002/ana.20.5822

8. Stone S, Madsen JR, Bolton J, Pearl PL, Chavakula V, Day E. A Standardized Electrode Nomenclature for Stereoelectroencephalography Applications [published online ahead of print, 2020 Jul 23]. *J Clin Neurophysiol.*

9. Chavakula V, Stone SSD. Movement Disorders. In: Di Rocco C, Pang D, Rutka JT (eds). Textbook of Pediatric Neurosurgery, 2020. NY: Springer International Publishing
10. Bolton J, Prabhu S, Park E-H, Stone S, Madsen JR. Surgical Approaches in Cortical Dysplasia. In Cataltepe O (ed). Pediatric Epilepsy Surgery: Preoperative Assessment and Surgical Treatment – 2nd Edition. 2019. Thieme.
11. Eklund SE, Samineni AV, Koka A, Riley BL, Brusseau RR, Shore BJ, Miller PE, Stone SS, Berde CB, Alrayashi W. Epidural catheter placement in children with baclofen pumps. *Paediatr Anaesth.* 2021 Feb;31(2):178-185. doi: 10.1111/pan.14061. Epub 2020 Nov 17. PMID: 33135307.
12. CreveCoeur TS, Yahanda AT, Maher CO, Johnson GW, Ackerman LL, Adelson PD, Ahmed R, Albert GW, Aldana PR, Alden TD, Anderson RCE, Baird L, Bauer DF, Bierbrauer KS, Brockmeyer DL, Chern JJ, Couture DE, Daniels DJ, Dauser RC, Durham SR, Ellenbogen RG, Eskandari R, Fuchs HE, George TM, Grant GA, Graupman PC, Greene S, Greenfield JP, Gross NL, Guillaume DJ, Haller G, Hankinson TC, Heuer GG, Iantosca M, Iskandar BJ, Jackson EM, Jea AH, Johnston JM, Keating RF, Kelly MP, Khan N, Krieger MD, Leonard JR, Mangano FT, Mapstone TB, McComb JG, Menezes AH, Muhlbauer M, Oakes WJ, Olavarria G, O'Neill BR, Park TS, Ragheb J, Selden NR, Shah MN, Shannon C, Shimony JS, Smith J, Smyth MD, Stone SSD, Strahle JM, Tamber MS, Torner JC, Tuite GF, Wait SD, Wellons JC, Whitehead WE, Limbrick DD. Occipital-Cervical Fusion and Ventral Decompression in the Surgical Management of Chiari-1 Malformation and Syringomyelia: Analysis of Data From the Park-Reeves Syringomyelia Research Consortium. *Neurosurgery.* 2021 Jan 13;88(2):332-341. doi: 10.1093/neuros/nyaa460. PMID: 33313928; PMCID: PMC7803430.
13. Karsten MB, Staffa SJ, McClain CD, Amon J, Stone SSD. Epidural analgesia for reduction of postoperative systemic opioid use following selective dorsal rhizotomy in children. *J Neurosurg Pediatr.* 2021 Mar 12;1-6. doi: 10.3171/2020.9.PEDS20501. Epub ahead of print. PMID: 33711802.
14. Sadler B, Skidmore A, Gewirtz J, Anderson RCE, Haller G, Ackerman LL, Adelson PD, Ahmed R, Albert GW, Aldana PR, Alden TD, Averill C, Baird LC, Bauer DF, Bethel-Anderson T, Bierbrauer KS, Bonfield CM, Brockmeyer DL, Chern JJ, Couture DE, Daniels DJ, Dlouhy BJ, Durham SR, Ellenbogen RG, Eskandari R, Fuchs HE, George TM, Grant GA, Graupman PC, Greene S, Greenfield JP, Gross NL, Guillaume DJ, Hankinson TC, Heuer GG, Iantosca M, Iskandar BJ, Jackson EM, Jea AH, Johnston JM, Keating RF, Khan N, Krieger MD, Leonard JR, Maher CO, Mangano FT, Menezes AH, Muhlbauer M, Oakes WJ, Olavarria G, O'Neill BR, Ragheb J, Selden NR, Shah MN, Shannon CN, Smith J, Smyth MD, Stone SSD, Tuite GF, Wait SD, Wellons JC, Whitehead WE, Park TS, Limbrick DD, Strahle JM. Extradural decompression versus duraplasty in Chiari malformation type I with syrinx: outcomes on scoliosis from the Park-Reeves Syringomyelia Research Consortium. *J Neurosurg Pediatr.* 2021 Jun 18:1-9. doi: 10.3171/2020.12.PEDS20552. Epub ahead of print. PMID: 34144521.
15. Shashi KK, Stone SSD, Berde CB, Padua HM. Intrathecal catheter and port placement for nusinersen infusion in children with spinal muscular atrophy and spinal fusion. *Pediatr Radiol.* 2021 Jul 12. doi: 10.1007/s00247-021-05126-4. Epub ahead of print. PMID: 34254153.
16. Hulsbergen AFC, Siddi F, McAvoy M, Lynch BT, Karsten MB, Stopa BM, Ashby J, McNulty J, Broekman MLD, Gormley WB, Stone SSD, Warf BC, Proctor MR. The Low Utility of Routine Cranial Imaging After Pediatric Shunt Revision. *J Neurosurg Pediatr.* 2021. [Accepted]
17. Chopra M, Gable DL, Love-Nichols J, Tsao A, Rockowitz S, Sliz P, Barkoudah E, Bastianelli L, Coulter D, Davidson E, DeGusmao C, Fogelman D, Huth K, Marshall P, Nimec D, Sanders JS, Shore BJ, Snyder B, Stone SSD, Uboda A, Watkins C, Berde C, Bolton J, Brownstein C, Costigan M, Ebrahimi-Fakhari D, Lai A, O'Donnell-Luria A, Paciorkowski AR, Pinto A, Pugh J, Rodan L, Roe E, Swanson L, Zhang B, Kruer MC, Sahin M, Poduri A, Srivastava S. Mendelian etiologies identified with whole exome sequencing in cerebral palsy. *Ann Clin Transl Neurol.* 2022 Feb;9(2):193-205. doi: 10.1002/acn3.51506. Epub 2022 Jan 24. PMID: 35076175; PMCID: PMC8862420.
18. Akbari SH, Yahanda A, Ackerman L, Adelson P, Ahmed R, Albert G, Aldana P, Alden T, Anderson R, Bauer D, Bethel-Anderson T, Bierbrauer K, Brockmeyer DL, Chern J, Couture D, Daniels D, Dlouhy B, Durham S, Ellenbogen RG, Eskandari R, Fuchs H, Grant G, Graupman P, Greene S, Greenfield J, Gross N, Guillaume D, Hankinson T, Heuer G, Iantosca M, Iskandar B, Jackson E, Jallo G, Johnston J, Kaufman B, Keating R, Khan N, Krieger M, Leonard J, Maher C, Mangano F, McComb J, McEvoy S, Meehan T, Menezes A, Muhlbauer M, O'Neill B, Olavarria G, Ragheb J, Selden N, Shah M, Shannon C, Shimony J, Smyth M, Stone S, Strahle J, Tamber M, Torner J, Tuite G, Tyler-Kabara E, Wait S, Wellons III J, Whitehead W, Park TS, Limbrick Jr. D. Complications and Outcomes of Posterior Fossa Decompression With Duraplasty Versus Without Duraplasty for Pediatric Patients with Chiari I Malformation and Syringomyelia: A Study From The Park-Reeves Syringomyelia Research Consortium. *J Neurosurg Pediatr.* 2021. [Accepted]
19. Akbari SHA, Yahanda AT, Ackerman LL, Adelson PD, Ahmed R, Albert GW, Aldana PR, Alden TD, Anderson RCE, Bauer DF, Bethel-Anderson T, Bierbrauer K, Brockmeyer DL, Chern JJ, Couture DE, Daniels DJ, Dlouhy BJ, Durham SR, Ellenbogen RG, Eskandari R, Fuchs HE, Grant GA, Graupman PC, Greene S, Greenfield JP, Gross NL, Guillaume DJ, Hankinson TC, Heuer GG, Iantosca M, Iskandar BJ, Jackson EM, Jallo GI.
20. Johnston JM, Kaufman BA, Keating RF, Khan NR, Krieger MD, Leonard JR, Maher CO, Mangano FT, McComb JG, McEvoy SD, Meehan T, Menezes AH, Muhlbauer MS, O'Neill BR, Olavarria G, Ragheb J, Selden NR, Shah MN, Shannon CN, Shimony JS, Smyth MD, Stone SSD, Strahle JM, Tamber MS, Torner JC, Tuite GF, Tyler-Kabara EC, Wait SD, Wellons JC, Whitehead WE, Park TS, Limbrick DD. Complications and outcomes of posterior fossa decompression with duraplasty versus without duraplasty for pediatric patients with Chiari malformation type I and syringomyelia: a study from the Park-Reeves Syringomyelia Research Consortium. *J Neurosurg Pediatr.* 2022 Apr 15:1-13. doi: 10.3171/2022.2.PEDS21446. Epub ahead of print. PMID: 35426814.
21. Madan E, Carrié S, Donado C, Lobo K, Souris M, Laine R, Beers E, Cornelissen L, Darras BT, Koka A, Riley B, Dinakar P, Stone S, Snyder B, Graham RJ, Padua H, Sethna N, Berde C. Nusinersen for Patients With Spinal Muscular Atrophy: 1415 Doses via an Interdisciplinary Institutional Approach. *Pediatr Neurol.* 2022 Apr 30;132:33-40. doi: 10.1016/j.pediatrneurol.2022.04.008. Epub ahead of print. PMID: 35636280.
22. Samineni AV, Eklund SE, Miller PE, Buxton K, Snyder BD, Matheney TH, Watkins CJ, Stone SSD, Alrayashi W, Brusseau R, Shore BJ. Epidural Analgesia Versus Lumbar Plexus Blockade After Hip Reconstruction Surgery in Children With Cerebral Palsy and Intrathecal Baclofen Pumps: A Comparison of Safety and Efficacy. *J Pediatr Orthop.* 2022 Apr 1;42(4):222-228. doi: 10.1097/BPO.0000000000002056. PMID: 35051954.
23. Akbari SHA, Rizvi AA, CreveCoeur TS, [...], Stone SSD, Baird LC, [...], Dacey RG, Park TS, Limbrick DD. Socioeconomic and demographic factors in the diagnosis and treatment of Chiari malformation type I and syringomyelia. *J Neurosurg Pediatr.* 2021 Dec 3:1-10. doi: 10.3171/2021.9.PEDS2185. Epub ahead of print. PMID: 34861643.
24. Stone S, Madsen JR, Bolton J, Pearl PL, Chavakula V, Day E. A Standardized Electrode Nomenclature for Stereoelectroencephalography Applications. *J Clin Neurophysiol.* 2021 Nov 1;38(6):509-515. doi: 10.1097/WNP.0000000000000724. PMID:32732496; PMCID: PMC8560154.
25. Nijman M, Yang E, Jaimes C, Prohl AK, Sahin M, Krueger DA, Wu JY, Northrup H, Stone SSD, Madsen JR, Fallah A, Blount JP, Weiner HL, Grayson L, Bebin EM, Porter BE, Warfield SK, Prabhu SP, Peters JM; TACERN Study Group. Limited utility of structural MRI to identify the epileptogenic zone in young children with tuberous sclerosis. *J Neuroimaging.* 2022 Jun 21. doi: 10.1111/jon.13016. Epub ahead of print. PMID: 35729081.
26. Smith E, Stone S. Revascularization Techniques in Pediatric Cerebrovascular Disorders. In Quinones-Hinojosa A (ed). Schmidek and Sweet: Operative Neurosurgical Techniques, 7th Edition. 2021. Elsevier Saunders
27. Hulsbergen AFC, Siddi F, McAvoy M, Lynch BT, Karsten MB, Stopa BM, Ashby J, McNulty J, Broekman MLD, Gormley WB, Stone SSD, Warf BC, Proctor MR. The Low Utility of Routine Cranial Imaging After Pediatric Shunt Revision. *J Neurosurg Pediatr.* 2021. [Accepted]
28. Hulsbergen AFC, Siddi F, McAvoy M, [...], Stone SSD, Warf BC, Proctor MR. The low utility of routine cranial imaging after pediatric shunt revision. *J Neurosurg Pediatr.* 2021 Nov 19:1-7. doi: 10.3171/2021.9.PEDS21261. a Epub head of print. PMID: 34798615.
29. Pasichnik A, Tsuboyama M, Jannati A, Vega C, Kaye HL, Damar U, Bolton J, Stone SSD, Madsen JR, Suarez RO, Rotenberg A. Discrepant expressive language lateralization in children and adolescents with epilepsy. *Ann Clin Transl Neurol.* 2022 Sep;9(9):1459-1464.

30. Stone SSD, Park EH, Bolton J, Harini C, Libenson MH, Rotenberg A, Takeoka M, Tsuboyama M, Pearl PL, Madsen JR. Interictal Connectivity Revealed by Granger Analysis of Stereoelectroencephalography: Association With Ictal Onset Zone, Resection, and Outcome. *Neurosurgery*. 2022 Oct 1;91(4):583-589.
31. Slingerland AL, Chua MMJ, Bolton J, Staffa SJ, Tsuboyama M, Prabhu SP, Pearl PL, Madsen JR, Stone SSD. Stereoelectroencephalography followed by combined electrode removal and MRI-guided laser interstitial thermal therapy or open resection: a single-center series in pediatric patients with medically refractory epilepsy. *J Neurosurg Pediatr*. 2022 Dec 9;31(3):206-211.
32. Buxton K, Morgan A, Northam WT, Stone SSD. Recurrent abdominal dislodgement of intrathecal pump and utility of infraclavicular site for patients with elevated body mass index: illustrative case. *J Neurosurg Case Lessons*. 2023 Jan 23;5(4):CASE22472.
33. Yossofzai O, Stone S, Madsen J, Moineddin R, Wang S, Ragheb J, Mohamed I, Bollo R, Clarke D, Perry MS, Weil AG, Raskin J, Pindrik J, Ahmed R, Lam S, Fallah A, Maniquis C, Andrade A, Ibrahim GM, Drake J, Rutka J, Taylor J, Mitsakakis N, Puka K, Widjaja E. Seizure outcome of pediatric magnetic resonance-guided laser interstitial thermal therapy versus open surgery: A matched noninferiority cohort study. *Epilepsia*. 2023 Jan;64(1):114-126.
34. Xiao Y, Chou CC, Cosgrove GR, Crone NE, Stone S, Madsen JR, Reucroft I, Shih YC, Weisholtz D, Yu HY, Anderson WS, Kreiman G. Cross-task specificity and within-task invariance of cognitive control processes. *Cell Rep*. 2023 Jan 31;42(1):111919.
35. Corona L, Tamilya E, Perry MS, Madsen JR, Bolton J, Stone SSD, Stufflebeam SM, Pearl PL, Papadelis C. Non-invasive mapping of epileptogenic networks predicts surgical outcome. *Brain*. 2023 May 2;146(5):1916-1931.
36. Matarrese MAG, Loppini A, Fabbri L, Tamilya E, Perry MS, Madsen JR, Bolton J, Stone SSD, Pearl PL, Filippi S, Papadelis C. Spike propagation mapping reveals effective connectivity and predicts surgical outcome in epilepsy.
37. Hassanzadeh E, Hornak A, Hassanzadeh M, Warfield SK, Pearl PL, Bolton J, Suarez R, Stone S, Stufflebeam S, Ailion AS. Comparison of fMRI language laterality with and without sedation in pediatric epilepsy. *Neuroimage Clin*. 2023 Jun [Online ahead of print]
38. *Brain*. 2023 Apr 5. [Online ahead of print] Warf BC, Weber DS, Day EL, Riordan CP, Staffa SJ, Baird LC, Fehnel KP, Stone SSD. Endoscopic third ventriculostomy with choroid plexus cauterization: predictors of long-term success and comparison with shunt placement for primary treatment of infant hydrocephalus. *J Neurosurg Pediatr*. 2023 May 12:1-13. [Online ahead of print]
39. Zaman Z, Straka N, Pinto AL, Srouji R, Tam A, Periasamy U, Stone S, Kleinman M, Northam WT, Ebrahimi-Fakhari D. Deep brain stimulation for medically refractory status dystonicus in UBA5-related disorder. *Mov Disord*. 2023 May 2. [Online ahead of print]
40. Phillips HW, Rangwala SD, Papadakis J, Segar DJ, Tsuboyama M, Pinto ALR, Harmon JP, Soriano SG, Munoz CJ, Madsen JR, See AP, Stone SS. Focal drug-resistant temporal lobe epilepsy associated with an ipsilateral anterior choroidal artery aneurysm: illustrative case. *J Neurosurg Case Lessons*. 2023 Jun 26;5(26):CASE23156.
41. Rijal S, Corona L, Perry MS, Tamilya E, Madsen JR, Stone SSD, Bolton J, Pearl PL, Papadelis C. Functional connectivity discriminates epileptogenic states and predicts surgical outcome in children with drug resistant epilepsy. *Sci Rep*. 2023 Jun 14;13(1):9622
42. Price K, Peine J, Mencattelli M, Chitalia Y, Pu D, Looi T, Stone S, Drake J, Dupont P. Neurosurgeons have two hands – shouldn't their robots? *Science Robotics*. 2023. [Accepted]
43. Rijal S, Corona L, Perry MS, Tamilya E, Madsen J, Stone S, Bolton J, Pearl PL, Papadelis C. Functional connectivity discriminates epileptogenic states and predicts surgical outcome in children with drug resistant epilepsy. *Scientific Reports*. 2023. [Accepted]
44. Chiu MY, Bolton J, Raskin JS, Curry DJ, Weiner HS, Pearl P, Stone S. In search of a common language: the Standardized Electrode Nomenclature for Stereo-electroencephalography Applications (SENSA). *J Clin Neurophysiol*. 2023. [Accepted]
45. Chericoni A, Ricci L, Ntolkeras G, Billardello R, Stone SSD, Madsen JR, Papadelis C, Grant PE, Pearl PL, Taffoni F, Rotenberg A, Tamilya E. Sleep Spindle Generation Before and After Epilepsy Surgery: A Source Imaging Study in Children with Drug-Resistant Epilepsy. *Brain Topogr*. 2024 Jan;37(1):88-101. doi: 10.1007/s10548-023-01007-1. Epub 2023 Sep 22. PMID: 37737957.
46. Ntolkeras G, Makaram N, Bernabei M, De La Vega AC, Bolton J, Madsen JR, Stone SSD, Pearl PL, Papadelis C, Grant EP, Tamilya E. Interictal EEG source connectivity to localize the epileptogenic zone in patients with drug-resistant epilepsy: A machine learning approach. *Epilepsia*. 2024 Apr;65(4):944-960. doi: 10.1111/epi.17898. Epub 2024 Feb 6. PMID: 38318986; PMCID: PMC11018464.
47. Mosher AM, Hartman E, Keusch D, Papadakis JE, Buxton K, Morgan A, Stone SSD, Northam WT. Spinal catheter revision in pediatric intrathecal baclofen pumps: risk factors and postoperative outcomes. *Neurosurg Focus*. 2024 Jun;56(6). doi: 10.3171/2024.3.FOCUS2467. PMID: 38823047.
48. Yahanda AT, Koueik J, Ackerman LL, Adelson PD, Albert GW, Aldana PR, Alden TD, Anderson RCE, Bauer DF, Bethel-Anderson T, Bierbrauer K, Brockmeyer DL, Chern JJ, Couture DE, Daniels DJ, Dlouhy BJ, Durham SR, Ellenbogen RG, Eskandari R, Fuchs HE, Grant GA, Graupman PC, Greene S, Greenfield JP, Gross NL, Guillaume DJ, Hankinson TC, Heuer GG, Iantosca M, Iskandar BJ, Jackson EM, Jallo GI, Johnston JM, Kaufman BA, Keating RF, Khan NR, Krieger MD, Leonard JR, Maher CO, Mangano FT, Martin J, McComb JG, McEvoy SD, Meehan T, Menezes AH, Muhlbauer MS, O'Neill BR, Olavarria G, Ragheb J, Selden NR, Shah MN, Shannon CN, Shimony JS, Smyth MD, Stone SSD, Strahle JM, Tamber MS, Torner JC, Tuite GF, Tyler-Kabara EC, Wait SD, Wellons JC, Whitehead WE, Park TS, Limbrick DD, Ahmed R. The role of occipital condyle and atlas anomalies on occipital cervical fusion outcomes in Chiari malformation type I with syringomyelia: a study from the Park-Reeves Syringomyelia Research Consortium. *J Neurosurg Pediatr*. 2024 Apr 5;34(1):66-74. doi: 10.3171/2024.1.PEDS23229. PMID: 38579359.
49. D'Gama AM, Phillips HW, Wang Y, Chiu MY, Chahine Y, Swanson AC, Smith RS, Pearl PL, Tsuboyama M, Madsen JR, Lidov H, Lee EA, Prabhu SP, Huang AY, Stone SSD, Walsh CA, Poduri A. Analysis of DNA from brain tissue on stereo-EEG electrodes reveals mosaic epilepsy-related variants. *medRxiv [Preprint]*. 2024 Jul 22:2024.07.21.24310779. doi: 10.1101/2024.07.21.24310779. PMID: 39108522; PMCID: PMC11302611.
50. Phillips HW, Papadakis JE, Borden BA, Pinto A, Tsuboyama M, Chiu MY, Madsen JR, Patil R, Stone SSD. Intralesional epileptiform activity in a fourth ventricular hamartoma associated with epileptic hemifacial spasm in a toddler: illustrative case. *J Neurosurg Case Lessons*. 2024 Jul 29;8(5). doi: 10.3171/CASE2452. PMID: 39074398; PMCID: PMC11301596.
51. Jahromi S, Matarrese MAG, Fabbri L, Tamilya E, Perry MS, Madsen JR, Bolton J, Stone SSD, Pearl PL, Papadelis C. Overlap of spike and ripple propagation onset predicts surgical outcome in epilepsy. *Ann Clin Transl Neurol*. 2024 Oct;11(10):2530-2547. doi: 10.1002/acn3.52156. Epub 2024 Oct 7. PMID: 39374135; PMCID: PMC11514932.





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PUBLICATIONS

1. Karimy JK, Reeves BC, Damisah E, Duy PQ, Antwi P, David W, Wang K, Schiff SJ, Limbrick DD Jr, Alper SL, Warf BC, Nedergaard M, Simard JM, Kahle KT. Inflammation in acquired hydrocephalus: pathogenic mechanisms and therapeutic targets. *Nat Rev Neurol*. 2020 May;16(5):285-296. doi: 10.1038/s41582-020-0321-y. Epub 2020 Mar 9. PMID: 32152460; PMCID: PMC7375440.
2. Bernstock JD, Tafel I, Segar DJ, Dowd R, Kappel A, Chen JA, Aglan O, Montaser A, Gupta S, Johnston B, Judge J, Fehnel K, Stone S, Warf BC. Complex Management of Hydrocephalus Secondary To Choroid Plexus Hyperplasia. *World Neurosurg*. 2020 Sep;141:101-109. doi: 10.1016/j.wneu.2020.05.211. Epub 2020 Jun 1. PMID: 32497849.
3. El-Dib M, Limbrick DD Jr, Inder T, Whitelaw A, Kulkarni AV, Warf BC, Volpe JJ, de Vries LS. Management of Post-hemorrhagic Ventricular Dilatation in the Infant Born Preterm. *J Pediatr*. 2020 Nov;226:16-27.e3. doi: 10.1016/j.jpeds.2020.07.079. Epub 2020 Jul 30. PMID: 32739263; PMCID: PMC8297821.
4. Olivieri DJ, Baticulon RE, Labuschagne JJ, Harkness W, Warf BC, Dewan MC. Geospatial Mapping of International Neurosurgical Partnerships and Evaluation of Extent of Training and Engagement. *World Neurosurg*. 2020 Dec;144:e898-e907. doi: 10.1016/j.wneu.2020.09.107. Epub 2020 Sep 28. PMID: 32992055.
5. Paulson JN, Williams BL, Hehnlly C, Mishra N, Sinnar SA, Zhang L, Ssentongo P, Mbabazi-Kabachelor E, Wijetunge DSS, von Bredow B, Mulondo R, Kiwanuka J, Bajunirwe F, Bazira J, Bebell LM, Burgoine K, Couto-Rodriguez M, Ericson JE, Erickson T, Ferrari M, Gladstone M, Guo C, Haran M, Hornig M, Isaacs AM, Kaaya BN, Kangere SM, Kulkarni AV, Kumbakumba E, Li X, Limbrick DD Jr, Magombe J, Morton SU, Mugamba J, Ng J, Olupot-Olupot P, Onen J, Peterson MR, Roy F, Sheldon K, Townsend R, Weeks AD, Whalen AJ, Quackenbush J, Ssenyonga P, Galperin MY, Almeida M, Atkins H, Warf BC, Lipkin WI, Broach JR, Schiff SJ. Paenibacillus infection with frequent viral coinfection contributes to postinfectious hydrocephalus in Ugandan infants. *Sci Transl Med*. 2020 Sep 30;12(563):eaba0565. doi: 10.1126/scitranslmed.aba0565. PMID: 32998967; PMCID: PMC7774825.
6. Tirrell TF, Demehri FR, Henry OS, Cullen L, Lillehei CW, Warf BC, Gates RL, Borer JG, Dickie BH. Safety of delayed surgical repair of omphalocele-exstrophy-imperforate anus-spinal defects (OEIS) complex in infants with significant comorbidities. *Pediatr Surg Int*. 2021 Jan;37(1):93-99. doi: 10.1007/s00383-020-04779-w. Epub 2020 Nov 24. PMID: 33231719.
7. Jin SC, Dong W, Kundishora AJ, Panchagnula S, Moreno-De-Luca A, Furey CG, Allocco AA, Walker RL, Nelson-Williams C, Smith H, Dunbar A, Conine S, Lu Q, Zeng X, Sierant MC, Knight JR, Sullivan W, Duy PQ, DeSpenza T, Reeves BC, Karimy JK, Marlier A, Castaldi C, Tikhonova IR, Li B, Peña HP, Broach JR, Kabachelor EM, Ssenyonga P, Hehnlly C, Ge L, Keren B, Timberlake AT, Goto J, Mangano FT, Johnston JM, Butler WE, Warf BC, Smith ER, Schiff SJ, Limbrick DD Jr, Heuer G, Jackson EM, Iskandar BJ, Mane S, Haider S, Guclu B, Bayri Y, Sahin Y, Duncan CC, Apuzzo MLJ, DiLuna ML, Hoffman EJ, Sestan N, Ment LR, Alper SL, Bilguvar K, Geschwind DH, Günel M, Lifton RP, Kahle KT. Exome sequencing implicates genetic disruption of prenatal neuro-gliogenesis in sporadic congenital hydrocephalus. *Nat Med*. 2020 Nov;26(11):1754-1765. doi: 10.1038/s41591-020-1090-2. Epub 2020 Oct 19. PMID: 33077954; PMCID: PMC7871900.
8. Xu H, Fame RM, Sadegh C, Sutin J, Naranjo C, Della Syau, Cui J, Shipley FB, Vernon A, Gao F, Zhang Y, Holtzman MJ, Heiman M, Warf BC, Lin PY, Lehtinen MK. Choroid plexus NKCC1 mediates cerebrospinal fluid clearance during mouse early postnatal development. *Nat Commun*. 2021 Jan 19;12(1):447. doi: 10.1038/s41467-020-20666-3. PMID: 33469018; PMCID: PMC7815709.
9. Isaacs AM, Morton SU, Movassagh M, Zhang Q, Hehnlly C, Zhang L, Morales DM, Sinnar SA, Ericson JE, Mbabazi-Kabachelor E, Ssenyonga P, Onen J, Mulondo R, Hornig M, Warf BC, Broach JR, Townsend RR, Limbrick DD Jr, Paulson JN, Schiff SJ. Immune activation during Paenibacillus brain infection in African infants with frequent cytomegalovirus co-infection. *iScience*. 2021 Mar 23;24(4):102351. doi: 10.1016/j.isci.2021.102351. PMID: 33912816; PMCID: PMC8065213.
10. Shibamura-Fujiogi M, Ormsby J, Breibart M, Warf BC, Priebe GP, Soriano SG, Sandora TJ, Yuki K. Risk factors for pediatric surgical site infection following neurosurgical procedures for hydrocephalus: a retrospective single-center cohort study. *BMC Anesthesiol*. 2021 Apr 21;21(1):124. doi: 10.1186/s12871-021-01342-5. PMID: 33882858; PMCID: PMC8059169.
11. Schiff SJ, Kulkarni AV, Mbabazi-Kabachelor E, Mugamba J, Ssenyonga P, Donnelly R, Levenbach J, Monga V, Peterson M, Cherukuri V, Warf BC. Brain growth after surgical treatment for infant postinfectious hydrocephalus in Sub-Saharan Africa: 2-year results of a randomized trial. *J Neurosurg Pediatr*. 2021 Jul 9:1-9. doi: 10.3171/2021.2.PEDS20949. Epub ahead of print. PMID: 34243157; PMCID: PMC8742836.
12. Peterson MR, Cherukuri V, Paulson JN, Ssentongo P, Kulkarni AV, Warf BC, Monga V, Schiff SJ. Normal childhood brain growth and a universal sex and anthropomorphic relationship to cerebrospinal fluid. *J Neurosurg Pediatr*. 2021 Jul 9;28(4):458-468. doi: 10.3171/2021.2.PEDS201006. PMID: 34243147; PMCID: PMC8594737.
13. Tindula G, Mukherjee SK, Ekramullah SM, Arman DM, Biswas SK, Islam J, Obrycki JF, Christiani DC, Liang L, Warf BC, Mazumdar M. Parental metal exposures as potential risk factors for spina bifida in Bangladesh. *Environ Int*. 2021 Dec;157:106800. doi: 10.1016/j.envint.2021.106800. Epub 2021 Aug 3. PMID: 34358915; PMCID: PMC9008873.
14. Lane JR, Ssentongo P, Peterson MR, Harper JR, Mbabazi-Kabachelor E, Mugamba J, Ssenyonga P, Onen J, Donnelly R, Levenbach J, Cherukuri V, Monga V, Kulkarni AV, Warf BC, Schiff SJ. Preoperative risk and postoperative outcome from subdural fluid collections in African infants with postinfectious hydrocephalus. *J Neurosurg Pediatr*. 2021 Oct 1;29(1):31-39. doi: 10.3171/2021.7.PEDS21209. PMID: 34598146; PMCID: PMC9078082.
15. Hulsbergen AFC, Siddi F, McAvoy M, Lynch BT, Karsten MB, Stopa BM, Ashby J, McNulty J, Broekman MLD, Gormley WB, Stone SSD, Warf BC, Proctor MR. The low utility of routine cranial imaging after pediatric shunt revision. *J Neurosurg Pediatr*. 2021 Nov 19:1-7. doi: 10.3171/2021.9.PEDS21261. Epub ahead of print. PMID: 34798615.
16. Harper JR, Cherukuri V, O'Reilly T, Yu M, Mbabazi-Kabachelor E, Mulondo R, Sheth KN, Webb AG, Warf BC, Kulkarni AV, Monga V, Schiff SJ. Assessing the utility of low resolution brain imaging: treatment of infant hydrocephalus. *Neuroimage Clin*. 2021;32:102896. doi: 10.1016/j.nicl.2021.102896. Epub 2021 Nov 23. PMID: 34911199; PMCID: PMC8646178.

17. Balashova E, Beaulieu O, Benhmida I, Birca A, Boylan G, Carkeek K, Chowdhury R, Cilio MR, Consoli A, Cote Corriveau G, Cuddyer D, Degtyarev D, Dehaes M, Dempsey E, Dereymaeker A, Desnoux B, El-Dib M, Elsayed E, Feldman HA, Finn D, Franceschini MA, Freeman S, Gagnon MM, Gagnon M, Garvey A, Ghosh A, Golubtsova Y, Grant PE, Hay SC, Hermans T, Herzberg E, Hsiao CH, Iennaco M, Inder T, Ionov O, Kaya K, Keister F, Kemigisha M, Kirtbaya A, Lee S, Leijser L, Liao S, Lin PY, Lippman R, Livingstone V, Luu TM, Magombe J, Mahdi Z, Marandyuk B, Martin A, Mathieson S, Mbabazi E, Mohammad K, Moore M, Mulondo R, Munster C, Murray D, Nalule E, Natukwatsa D, Naulaers G, Noroozi M, Nsubuga B, O'Toole J, Pavel A, Peterson M, Pinchefskey E, Playter K, Queally J, Rajaram A, Ryndin A, Schiff S, Seruwu M, Sharafutdinova D, Sheldon Y, Simard MN, Sims J, Steele T, Stritzke A, Sunwoo J, Sutin J, Tatz J, Vadset T, Vesoulis Z, Vyas R, Wabukoma M, Walsh B, Wandukwa J, Warf BC, Whitehead H, Woglom M, Yen FY, Zampolli L, Zavriyev Al, Zein H, Zimmermann B, Zubkov V. Proceedings of the 13th International Newborn Brain Conference: Other forms of brain monitoring, such as NIRS, fMRI, biochemical. *J Neonatal Perinatal Med.* 2022;15(2):453-465. doi: 10.3233/NPM-229005. PMID: 35431188.
18. Vadset TA, Rajaram A, Hsiao CH, Kemigisha Katungi M, Magombe J, Seruwu M, Kaaya Nsubuga B, Vyas R, Tatz J, Playter K, Nalule E, Natukwatsa D, Wabukoma M, Neri Perez LE, Mulondo R, Queally JT, Fenster A, Kulkarni AV, Schiff SJ, Grant PE, Mbabazi Kabachelor E, Warf BC, Sutin JDB, Lin PY. Improving Infant Hydrocephalus Outcomes in Uganda: A Longitudinal Prospective Study Protocol for Predicting Developmental Outcomes and Identifying Patients at Risk for Early Treatment Failure after ETV/CPC. *Metabolites.* 2022 Jan 14;12(1):78. doi: 10.3390/metabo12010078. PMID: 35050201; PMCID: PMC8781620.
19. Tirrell TF, Demehri FR, Lillehei CW, Borer JG, Warf BC, Dickie BH. Hindgut Duplication in an Infant with Omphalocele-Exstrophy-Imperforate Anus-Spinal Defects (OEIS) Complex. *European J Pediatr Surg Rep.* 2022 Mar 10;10(1):e45-e48. doi: 10.1055/s-0041-1742154. PMID: 35282303; PMCID: PMC8913173.
20. Rolle ML, Bhebhe A, Munkondya A, Kharbat AF, Kaskie N, McLellan R, Nahed BV, Warf BC, Kunda H, Sichizya K. Qualitative and Quantitative Analysis of Pediatric Post Neurosurgical Care in a Lower Middle-Income Country: The Zambian Experience. *World Neurosurg.* 2022 Nov;167:e784-e788. doi: 10.1016/j.wneu.2022.08.098. Epub 2022 Aug 29. PMID: 36049724.
21. Warf BC. Postinfectious hydrocephalus in African infants: common, under-recognised, devastating, and potentially preventable. *Lancet Glob Health.* 2022 Dec;10(12):e1695-e1696. doi: 10.1016/S2214-109X(22)00461-2. PMID: 36400074.
22. Sadegh C, Xu H, Sutin J, Fatou B, Gupta S, Pragana A, Taylor M, Kalugin PN, Zawadzki ME, Alturkistani O, Shipley FB, Dani N, Fame RM, Wurie Z, Talati P, Schleicher RL, Klein EM, Zhang Y, Holtzman MJ, Moore CI, Lin PY, Patel AB, Warf BC, Kimberly WT, Steen H, Andermann ML, Lehtinen MK. Choroid plexus-targeted NKCC1 overexpression to treat post-hemorrhagic hydrocephalus. *Neuron.* 2023 Mar 1:50896-6273(23)00124-1. doi: 10.1016/j.neuron.2023.02.020. Epub ahead of print. PMID: 36893755.
23. Warf BC, Weber DS, Dar EL, Riordan CP, Staffa SJ, Baird L, Fehnel KP, Stone SS. Endoscopic third ventriculostomy with choroid plexus cauterization: predictors of long-term success and comparison with shunt placement for primary treatment of infant hydrocephalus. *Journal of Neurosurgery Pediatrics,* 2023 (in press) – NOW PUBLISHED
24. Lin P, Sutin J, Mbabazi-Kabachelor E, Farzam P, Ssenyonga P, Kimbugwe J, Nalule E, Nsubuga BK, Grant PE, Schiff SJ, Warf BC, Fanceschini MA. Diffuse optical spectroscopy as a diagnostic and prognostic tool for post-infectious hydrocephalus in Sub-Saharan African children. (under review, Technical Reports of Nature Medicine)
25. Morbidity and etiology-based success rate of combined endoscopic ventriculostomy and choroid plexus cauterization: a systematic review and mega-analysis of 1918 infants. Albalkhi I, Garatli S, Halel B, Saleh T, Al Ramadan AH, Warf BC. *Neurosurgical Review* 46(1), 180ff
26. Paenibacillus spp infection among infants with postinfectious hydrocephalus in Uganda: an observational case-control study SU Morton, C Hehnly, K Burgoine, P Ssentongo, JE Ericson, MS Kumar, *The Lancet Microbe,* 2023:https://doi.org/10.1016/S2666-5247(23)00106-4
27. Choroid plexus-targeted NKCC1 overexpression to treat post-hemorrhagic hydrocephalus C Sadegh, H Xu, J Sutin, B Fatou, S Gupta, A Pragana, M Taylor, ... *Neuron* 111 (10), 1591-1608. e4
28. Endoscopic third ventriculostomy with choroid plexus cauterization: predictors of long-term success and comparison with shunt placement for primary treatment of infant ... BC Warf, DS Weber, EL Day, CP Riordan, SJ Staffa, LC Baird, KP Fehnel, ... *Journal of Neurosurgery: Pediatrics* 1 (aop), 1-13
29. Paenibacillosis: An Emerging Cause of Neonatal Sepsis and Postinfectious Hydrocephalus JE Ericson, K Burgoine, C Hehnly, E Kumbakumba, M Ochora, ...*Open Forum Infectious Diseases* 9 (Supplement_2), ofac492. 1158
30. Postinfectious hydrocephalus in African infants: common, under-recognised, devastating, and potentially preventable BC Warf *The Lancet Global Health* 10 (12), e1695-e1696
31. Parental arsenic exposure and DNA methylation in Bangladeshi infants with spina bifida G Tindula, SK Mukherjee, SM Ekramullah, DM Arman, J Islam, B Lemos, ... *ISEE Conference Abstracts* 2022 (1)
32. The role of routine imaging for hydrocephalus surveillance Response BC Warf, WB Gormley, SSD Stone, MR Proctor *JOURNAL OF NEUROSURGERY-PEDIATRICS* 29 (5), 596-597
33. PD02-01 PRENATAL CLOSURE OF MYELOMENINGOCELE IS ASSOCIATED WITH HIGHER RISK FOR EARLY SECONDARY SPINAL CORD TETHERING HH Wang, D Morhardt, B Warf, L Karlin, A Hojjat, S Khoshbin, ... *The Journal of Urology* 207 (Supplement 5), e35
34. Fehnel K, Klein J, Warf BC, Smith E, Orbach D. Reversible intracranial hypertension following treatment of an extracranial vascular malformation. *J Neurosurg Pediatr* 23(3):369-373, 2019
35. Bernstock JD, Tafel I, Segar DJ, Dowd R, Kappel A, Chen JA, Aglan J, Montaser A, Gupta S, Johnston B, Judge J, Fehnel K, Stone S, Warf BC. *World Neurosurgery,* 2020, Sep:141:101-109.
36. Wei CF, Mukherjee SK, Ekramullah SM, Arman DM, Islam MJ, Azim M, Rahman A, Rahman MN, Ziauddin M, Tindula G, Suchanda HS, Gomberg DF, Weisskopf MG, Liang L, Warf BC, Christiani DC, Mazumdar M. Arsenic modifies the effect of folic acid in spina bifida prevention, a large hospital-based case-control study in Bangladesh. *Res Sq [Preprint].* 2024 Feb 29.3.rs-3989039. doi: 10.21203/rs.3.rs-3989039/v1. Update in: *Environ Health.* 2024 Jun 3;23(1):51. doi: 10.1186/s12940-024-01091-1. PMID: 38464105; PMCID: PMC10925447.
37. Tindula G, Issac B, Mukherjee SK, Ekramullah SM, Arman DM, Islam J, Suchanda HS, Sun L, Rockowitz S, Christiani DC, Warf BC, Mazumdar M. Genome-wide analysis of spina bifida risk variants in a case-control study from Bangladesh. *Birth Defects Res.* 2024 Mar;116(3). doi: 10.1002/bdr2.2331. PMID: 38526198; PMCID: PMC10963057.
38. Podkovik S, Zhou C, Coffin SE, Hall M, Hauptman JS, Kronman MP, Mangano FT, Pollack IF, Sedano S, Schaffzin JK, Thorell E, Warf BC, Whitlock KB, Simon TD. Utilization trends in cerebrospinal fluid shunt infection prevention techniques in the United States from 2007 to 2015. *J Neurosurg Pediatr.* 2024 Jan 5;33(4):349-358. doi: 10.3171/2023.11.PEDS2337. PMID: 38181501; PMCID: PMC10810681.
39. Podkovik S, Zhou C, Coffin SE, Hall M, Hauptman JS, Kronman MP, Mangano FT, Pollack IF, Sedano S, Vega J, Schaffzin JK, Thorell E, Warf BC, Whitlock KB, Simon TD. Antibiotic impregnated catheters and intrathecal antibiotics for CSF shunt infection prevention in children undergoing low-risk CSF shunt surgery. *BMC Pediatr.* 2024 May 11;24(1):325. doi: 10.1186/s12887-024-04798-9. PMID: 38734598; PMCID: PMC11088062.
40. Wei CF, Mukherjee SK, Ekramullah SM, Arman DM, Islam MJ, Azim M, Rahman A, Rahman MN, Ziauddin M, Tindula G, Suchanda HS, Gomberg DF, Weisskopf MG, Liang L, Warf BC, Christiani DC, Mazumdar M. Arsenic modifies the effect of folic acid in spina bifida prevention, a large hospital-based case-control study in Bangladesh. *Environ Health.* 2024 Jun 3;23(1):51. doi: 10.1186/s12940-024-01091-1. PMID: 38831396; PMCID: PMC11145859.
41. Mukherjee SK, Papadakis JE, Arman DM, Islam J, Azim M, Rahman A, Ekramullah SM, Suchanda HS, Farooque A, Warf BC, Mazumdar M. The Importance of Neurosurgical Intervention and Surgical Timing for Management of Pediatric Patients with Myelomeningoceles in Bangladesh. *World Neurosurg.* 2024 Jul;187. doi: 10.1016/j.wneu.2024.04.144. Epub 2024 Apr 27. PMID: 38685347; PMCID: PMC11227413.
42. Simon TD, Hayati Rezvan P, Coffin SE, Hall M, Hauptman JS, Kronman MP, Mangano FT, Podkovik S, Pollack IF, Schaffzin JK, Thorell E, Warf BC, Zhou C, Whitlock KB. Infection rates during eras of intrathecal antibiotic use followed by antibiotic-impregnated catheter use in prevention of cerebrospinal fluid shunt infection. *J Neurosurg Pediatr.* 2024 Jul 19;34(4):357-364. doi: 10.3171/2024.5.PEDS23372. PMID: 39029119; PMCID: PMC11444882.
43. Wei CF, Tindula G, Mukherjee SK, Wang X, Ekramullah SM, Arman DM, Islam MJ, Azim M, Rahman A, Afreen S, Ziaddin M, Warf BC, Weisskopf MG, Christiani DC, Liang L, Mazumdar M. Maternal arsenic exposure modifies associations between arsenic, folate and arsenic metabolism gene variants, and spina bifida risk: A case-control study in Bangladesh. *Environ Res.* 2024 Nov 15;261:119714. doi: 10.1016/j.envres.2024.119714. Epub 2024 Jul 31. PMID: 39094898; PMCID: PMC11460318.

