



## Ben Waldau, M.D., M.A.S., F.A.A.N.S., F.A.C.S.

### Philosophy of Care

My formal training includes general neurosurgery, endovascular neurosurgery and neural stem cell research. As an open cerebrovascular and endovascular neurosurgeon, I treat patients with aneurysms, arteriovenous malformations, cavernous malformations, Moyamoya disease and acute large cerebral vessel occlusions. I have also received extensive training in stem cell research. I worked as a postdoctoral researcher for Dr. Steven Goldman on oligodendrocyte progenitor cell biology. As a neurosurgery resident at Duke University, I transplanted GABAergic neural stem cells into a rat seizure model in my dedicated research year with Dr. Ashok Shetty. After residency and fellowship training, I completed a 1-year fellowship with Dr. Gerd Kempermann on dentate progenitor cell transplantation into a mouse model of deficient dentate neurogenesis. At UC Davis, I started to run an active basic science research lab. I am supported by a K08 to study the mechanism of memory decline in a rat model of intraventricular hemorrhage. I am also supported by an intramural California Institute of Regenerative Medicine (CIRM) grant to achieve perfusion of vascularized human brain organoids in vivo. In 2015, my group developed induced pluripotent stem cells (iPSCs) from the dura of a UC Davis patient. We were subsequently the first group worldwide to publish on vascularization of human brain organoids with iPSC-derived human endothelial cells from the same patient. I work with junior specialists from the Institute of Regenerative Cures under the leadership of Dr. Jan Nolta to generate the vascularized human brain organoids. One of my overarching research goals is to model the human blood-brain barrier with human brain organoids in vitro and in vivo.

### Clinical Interests

Dr. Waldau is a specialist in open cerebrovascular and endovascular treatment of cerebral aneurysms and arteriovenous malformations. His dual training in open surgery and endovascular embolization allows him to choose the best treatment modality for his patients, and sometimes he uses a combination of both approaches to achieve the best results. He also has an interest in stroke and extracranial carotid disease which he can treat with carotid endarterectomy or carotid angioplasty and stenting. With the establishment of the stroke unit at UC Davis, we are striving to provide highly specialized care to our vascular patients to achieve the best outcomes.

### Research/Academic Interests

Dr. Waldau holds an NIH grant to study the mechanism of memory decline after intraventricular hemorrhage in a rodent model. His further basic science research efforts are focused on understanding the role of dentate gyrus neurogenesis and transplantation of vascularized cerebral organoids for functional recovery after stroke. In clinical research, Dr. Waldau works on robotic solutions for endovascular care.

**Title** Professor

**Specialty**



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	Neurological Surgery, <a href="#">Surgery - Vascular and Endovascular</a> , Skull Base Surgery, Brain Tumors, Spine Surgery
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Division	Neurological Surgery
Clinic	Neurological Surgery Clinic UC Davis Medical Group, Sacramento - Midtown
Center/Program Affiliation	<a href="#">Center for Neuroscience</a> <a href="#">Center for Skull Base Surgery</a> <a href="#">UC Davis Medical Group</a> <a href="#">Spine Center</a>
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Languages	German
Education	M.D., Ruprecht-Karls University, Heidelberg, Germany 2002 M.A.S., Clinical Research, UC Davis, Sacramento CA 2020
Internships	General Surgery, Duke University Medical Center, Durham NC 2004-2005
Residency	Neurosurgery, Duke University Medical Center, Durham NC 2004-2005
Fellowships	Endovascular Neurosurgery, University of Florida, Gainesville FL 2010-2011 Neural Stem Cell Research, William P. Van Wagenen Fellowship at Center for Regenerative Therapies Dresden, Dresden, Germany 2011-2012
Board Certifications	American Board of Neurological Surgery - Diplomate Recognition of Focused Practice (RFP), CNS Endovascular Surgery



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### Professional Memberships

American Association of Neurological Surgeons  
Congress of Neurological Surgeons  
Society for Neuroscience

### Honors and Awards

UC Davis Stroke Center Award of Excellence, 2015  
Duke Neurosurgery Resident Scholar Award, 2008, 2009, 2010  
CNS Basic Science/Translational Research Resident Fellowship Award, 2007

### Select Recent Publications

Robinow ZM, Peterson C, Waldau B, Shahlaie K. Supraorbital Keyhole Craniotomy via Eyebrow Incision: A Systematic Review and Meta-Analysis. *World Neurosurg.* 2021 Nov 11:S1878-8750 (21)01714-9. doi:10.1016/j.wneu.2021.11.015. Epub ahead of print. PMID:34775096.

Sanchez B, Delemos CD, Sandhu KS, Peterson C, Cord BJ, Gurkoff GG, Waldau B. Aneurysmal subarachnoid hemorrhage survivors show long-term deficits in spatial reference memory in a pilot study of a virtual water maze paradigm. *Clin Neurol Neurosurg.* 2021 Aug;207:106788. doi: 10.1016/j.clineuro.2021.106788. Epub 2021 Jun 25. PMID:34230004.

Gerndt CH, Goodrich DJ, Ramanathan D, Dahlin BC, Waldau B. Management of a ruptured and unruptured pial arteriovenous fistula during and after pregnancy. *Brain Circ.* 2021 May 29;7(2):124-127. doi:10.4103/bc.bc\_37\_20. PMID:34189356.

Noblett D, Hacein-Bey L, Waldau B, Ziegler J, Dahlin B, Chang J. Increased rupture risk in small intracranial aneurysms associated with methamphetamine use. *Interv Neuroradiol.* 2021 Feb;27(1):75-80. doi:10.1177/1591019920959534. Epub 2020 Sep 23. PMID:32967503.

Kercher MJ, Ramanathan D, Dahlin BC, Yee AH, Clouse JW, Waldau B. Mechanical Thrombectomy for Sequential Bilateral Middle Cerebral Artery Occlusions in a Patient With Recurrent Cryptogenic Strokes: A Case Report. *Neurohospitalist.* 2021 Jan;11(1):54-58. doi:10.1177/1941874420934333. Epub 2020 Jun 25. PMID:33868558.

Kamal K, Keiter JA, Binyamin TR, de la Cruz Dapula JN, Vergara AR, Hawk CW, Izadi A, Lyeth B,



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Gurkoff GG, Sharp FR, Waldau B. Mechanical injury and blood are drivers of spatial memory deficits after rapid intraventricular hemorrhage. *Neurobiol Dis.* 2020 Nov;145:105084. doi: 10.1016/j.nbd.2020.10584.

Peterson C, Waldau B. Transradial access for thrombectomy in acute stroke: A systematic review and meta-analysis. *Clin Neurol Neurosurg.* 2020 Nov;198:106235. doi:10.1016/j.clineuro.2020.106235. Epub 2020 Sep 18. PMID:32979680.

Omofoye OA, Riestenberg RA, Waldau B. Impairment of glymphatic flow secondary to large terminal internal carotid artery aneurysm: Case report. *Clin Neurol Neurosurg.* 2020 Oct;197:106190. doi:10.1016/j.clineuro.2020.106190. Epub 2020 Aug 26. PMID:32905979.

Thaci B, Nuño M, Varshneya K, Gerndt CH, Kercher M, Dahlin BC, Waldau B. Three-dimensional aneurysm volume measurements show no correlation between coil packing density and recurrence. *Heliyon.* 2020 Oct 8;6(10):e05170. doi:10.1016/j.heliyon.2020.e05170. PMID:33083618.

Xu H, Stamova B, Ander BP, Waldau B, Jickling GC, Sharp FR, Ko NU. mRNA Expression Profiles from Whole Blood Associated with Vasospasm in Patients with Subarachnoid Hemorrhage. *Neurocrit Care.* 2020 Aug;33(1):82-89. doi:10.1007/s12028-019-00861-x. PMID:31595394.

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