

William L. Gross, MD PhD

Medical College of Wisconsin | 8701 W Watertown Plank Rd, Milwaukee, WI 53226

bgross@mcw.edu | 414-955-4653

FACULTY APPOINTMENTS

Current Appointments:

Associate Professor of Anesthesiology	Medical College of Wisconsin	2024 – present
Secondary appointment in Neurology	Medical College of Wisconsin	2019 – present
Secondary in Biophysics & Biomed. Eng.	Medical College of Wisconsin	2022 – present
Co-Director, Anesthesiology Clinomics	Medical College of Wisconsin	2024 – present

Prior Appointments:

Director, Med. Student Anesth. Clerkship	Medical College of Wisconsin	2021 – 2025
Assistant Professor of Anesthesiology	Medical College of Wisconsin	2019 – 2024
Instructor, Anesthesiology	Medical College of Wisconsin	2018 – 2019

EDUCATION

Neuroanesthesiology Fellow	Medical College of Wisconsin	7/2018 – 6/2019
Resident, Anesthesiology	Medical College of Wisconsin	7/2014 – 6/2018
Post-doctoral Research Fellow	Medical College of Wisconsin	7/2013 – 7/2014
Resident, Neurosurgery	The Ohio State University	7/2012 – 6/2013
M.D.	Medical College of Wisconsin	8/2005 – 5/2012
Ph.D., Biophysics	Medical College of Wisconsin	7/2007 – 6/2010
<i>Emphasis on Neuroscience and MRI, mentored by Dr. Jeffrey Binder, MD</i>		
<i>Dissertation: “Using fMRI to Improve Outcome in the Surgical Treatment of Temporal Lobe Epilepsy.”</i>		
B.A., Psychology	University of Wisconsin, Milwaukee	8/2001 – 5/2004

ADDITIONAL TRAINING & CERTIFICATIONS

Additional Training:

Clinical Research Scholars Program	CTSI of Southeastern Wisconsin	2020 – 2022
Physician Scientist Training Program	Dept. of Anesthesiology, MCW	2014 – 2018

Certifications:

Board certified	American Board of Anesthesiology	3/5/20 – present
Basic PTE, Testamer	National Board of Echocardiography	12/2/2020

GRANTS AWARDED

Brain-to-text computer interfaces as a precursor for artificial speech restoration in aphasia

Co-I (PI: Anderson)	2024 – 2026
AHW Momentum 5520801 \$250,000 total funds	

Decoding mental concept identities using electrocorticography

PI	2023 – 2026
NIDCD R21 DC021013 \$585,000 total funds	

Center for Aphasia Research and Recovery

Co-I (PI: Binder)

2022 – 2024

AHW PPG Pilot AHW004327 | \$250,000 direct funds

Defining the Neural Dynamics of Concept Retrieval Using Electrocorticography

PI

2020 – 2022

Supported by NIH NCATS KL2 TR001438 | \$279,400 direct funds

Localizing critical areas for concept identification with fMRI

PI

2021 – 2022

AHW CNRP Seed Grant Award | \$20,000 direct funds

PUBLICATIONS

- Anderson AJ, Fernandino L, **Gross WL**, Rey HG, Binder JR. (2025) Neural decoding of autobiographical mental image features with a general semantic model. *Nat Commun*; 16(1):11208. doi:10.1038/s41467-025-65541-1. PMID:41387573.
- Pillay S, Maruska B, Butts AM, Saber M, **Gross WL**. (2025) The Differential Effects of Propofol and Dexmedetomidine on Intraoperative Neuropsychological Testing During Awake Craniotomies. *World Neurosurg*; 202:124400. doi:10.1016/j.wneu.2025.124400. PMID:40850667.
- Gross WL**, Swanson SJ, Helfand AI, Pillay SB, Humphries CJ, Raghavan M, et al.. (2025) Predicting memory decline from left temporal lobe epilepsy surgery using preoperative fMRI: a multicenter study. *Neuroimage Clin*; 46:103804. doi:10.1016/j.nicl.2025.103804. PMID:40424645.
- Pillay SB, **Gross WL**, Janecek JK, Binder JR, Oleksy AJ, Swanson SJ. (2023) Reliable change on the selective reminding test in a series of left-hemisphere language dominant patients with right temporal lobe epilepsy. *Epilepsy Behav*; 138:109004. doi:10.1016/j.yebeh.2022.109004. PMID:36473300.
- Youssofzadeh V, Conant L, Stout J, Ustine C, Humphries C, **Gross WL**, et al.. (2022) Late dominance of the right hemisphere during narrative comprehension. *Neuroimage*; 264:119749. doi:10.1016/j.neuroimage.2022.119749. PMID:36379420.
- Pillay SB, **Gross WL**, Heffernan J, Book DS, Binder JR. (2022) Semantic network activation facilitates oral word reading in chronic aphasia. *Brain Lang*; 233:105164. doi:10.1016/j.bandl.2022.105164. PMID:35933744.
- Gross WL**, Helfand AI, Swanson SJ, Conant LL, Humphries CJ, Raghavan M, et al.. (2022) Prediction of Naming Outcome With fMRI Language Lateralization in Left Temporal Epilepsy Surgery. *Neurology*; 98(23):e2337-e2346. doi:10.1212/WNL.0000000000200552. PMID:35410903.
- Gross WL**, Sacho RH. (2021) Intracranial Vascular Procedures. *Anesthesiol Clin*; 39(1):1-18. doi:10.1016/j.anclin.2020.10.001. PMID:33563374.
- Binder JR, Tong JQ, Pillay SB, Conant LL, Humphries CJ, Raghavan M, et al.. (2020) Temporal lobe regions essential for preserved picture naming after left temporal epilepsy surgery. *Epilepsia*; 61(9):1939-1948. doi:10.1111/epi.16643. PMID:32780878.
- Youssofzadeh V, Stout J, Ustine C, **Gross WL**, Conant LL, Humphries CJ, et al.. (2020) Mapping language from MEG beta power modulations during auditory and visual naming. *Neuroimage*; 220:117090. doi:10.1016/j.neuroimage.2020.117090. PMID:32593799.
- Swanson SJ, Conant LL, Humphries CJ, LeDoux M, Raghavan M, Mueller WM, et al.. (2020) Changes in description naming for common and proper nouns after left anterior temporal lobectomy. *Epilepsy Behav*; 106:106912. doi:10.1016/j.yebeh.2020.106912. PMID:32179500.
- Gross WL**, Lauer KK, Liu X, Roberts CJ, Liu S, Gollapudy S, et al.. (2019) Propofol Sedation Alters Perceptual and Cognitive Functions in Healthy Volunteers as Revealed by Functional Magnetic Resonance Imaging. *Anesthesiology*; 131(2):254-265. doi:10.1097/ALN.0000000000002669. PMID:31314747.

- Liu X, Lauer KK, Ward BD, Roberts CJ, Liu S, Gollapudy S, et al.. (2019) Regional entropy of functional imaging signals varies differently in sensory and cognitive systems during propofol-modulated loss and return of behavioral responsiveness. *Brain Imaging Behav*; 13(2):514-525. doi:10.1007/s11682-018-9886-0. PMID:29737490.
- Pillay SB, **Gross WL**, Graves WW, Humphries C, Book DS, Binder JR. (2018) The Neural Basis of Successful Word Reading in Aphasia. *J Cogn Neurosci*; 30(4):514-525. doi:10.1162/jocn_a_01214. PMID:29211656.
- Liu X, Lauer KK, Ward BD, Roberts CJ, Liu S, Gollapudy S, et al.. (2017) Fine-Grained Parcellation of Brain Connectivity Improves Differentiation of States of Consciousness During Graded Propofol Sedation. *Brain Connect*; 7(6):373-381. doi:10.1089/brain.2016.0477. PMID:28540741.
- Pillay SB, Binder JR, Humphries C, **Gross WL**, Book DS. (2017) Lesion localization of speech comprehension deficits in chronic aphasia. *Neurology*; 88(10):970-975. doi:10.1212/WNL.0000000000003683. PMID:28179469.
- Liu X, Lauer KK, Douglas Ward B, Roberts C, Liu S, Gollapudy S, et al.. (2017) Propofol attenuates low-frequency fluctuations of resting-state fMRI BOLD signal in the anterior frontal cortex upon loss of consciousness. *Neuroimage*; 147:295-301. doi:10.1016/j.neuroimage.2016.12.043. PMID:27993673.
- Binder JR, Pillay SB, Humphries CJ, **Gross WL**, Graves WW, Book DS. (2016) Surface errors without semantic impairment in acquired dyslexia: a voxel-based lesion-symptom mapping study. *Brain*; 139(Pt 5):1517-26. doi:10.1093/brain/aww029. PMID:26966139.
- Fernandino L, Humphries CJ, Seidenberg MS, **Gross WL**, Conant LL, Binder JR. (2015) Predicting brain activation patterns associated with individual lexical concepts based on five sensory-motor attributes. *Neuropsychologia*; 76:17-26. doi:10.1016/j.neuropsychologia.2015.04.009. PMID:25863238.
- Fernandino L, Binder JR, Desai RH, Pendl SL, Humphries CJ, **Gross WL**, et al.. (2016) Concept Representation Reflects Multimodal Abstraction: A Framework for Embodied Semantics. *Cereb Cortex*; 26(5):2018-34. doi:10.1093/cercor/bhv020. PMID:25750259.
- Gross WL**, Binder JR. (2014) Alternative thresholding methods for fMRI data optimized for surgical planning. *Neuroimage*; 84:554-61. doi:10.1016/j.neuroimage.2013.08.066. PMID:24021837.
- Langford J, **Gross WL**. (2011) Psychosis in the context of sodium oxybate therapy. *J Clin Sleep Med*; 7(6):665-6. doi:10.5664/jcsm.1478. PMID:22171207.
- Binder JR, **Gross WL**, Allendorfer JB, Bonilha L, Chapin J, Edwards JC, et al.. (2011) Mapping anterior temporal lobe language areas with fMRI: a multicenter normative study. *Neuroimage*; 54(2):1465-75. doi:10.1016/j.neuroimage.2010.09.048. PMID:20884358.
- Gross WL (2010). Using fMRI to Improve Outcome in the Surgical Treatment of Temporal Lobe Epilepsy. PhD dissertation, Medical College of Wisconsin.
- Nielson KA, Seidenberg M, Woodard JL, Durgerian S, Zhang Q, **Gross WL**, et al.. (2010) Common neural systems associated with the recognition of famous faces and names: an event-related fMRI study. *Brain Cogn*; 72(3):491-8. doi:10.1016/j.bandc.2010.01.006. PMID:20167415.
- Gross WL**, Greene AJ. (2007) Analogical inference: the role of awareness in abstract learning. *Memory*; 15(8):838-44. doi:10.1080/09658210701715469. PMID:18033621.
- Greene AJ, **Gross WL**, Elsinger CL, Rao SM. (2007) Hippocampal differentiation without recognition: an fMRI analysis of the contextual cueing task. *Learn Mem*; 14(8):548-53. doi:10.1101/lm.609807. PMID:17690338.
- Greene AJ, **Gross WL**, Elsinger CL, Rao SM. (2006) An FMRI analysis of the human hippocampus: inference, context, and task awareness. *J Cogn Neurosci*; 18(7):1156-73. doi:10.1162/jocn.2006.18.7.1156. PMID:16839289.

INVITED LECTURES

Toward an Implanted Language Neuroprosthesis for Severe Aphasia

Visiting professor, University of Madison Dept. of Anesthesiology Grand Rounds

2/7/2024

Beyond Wernicke's – Advancing our Approach to Preventing Language Deficits

Invited lecture, University of Washington, Seattle

6/8/2021

TEACHING & MENTORING

PhD Mentees & Committees

Dewan Imran Ahmed (Mentee)	MCW, Biomed. Eng.	2026 – present
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Alex Skitowski (Mentee)	MCW, Biophysics	2024 – present
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Aleksandra Winiarz (Committee)	MCW, Biophysics	2021 – present
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Stephen Mazurchuk (Committee)	MCW, Biophysics	Graduated 2024
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Dissertation: "An Experiential Account of Semantic Category Organization in the Brain"

Alexander Helfand (Committee)	MCW, Biophysics	Graduated 2020
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Dissertation: "Toward a gold standard: An outcomes-based assessment of fMRI-based methods for probing language laterality in the brain"

Postdoctoral Fellows

Sunil Mathew, PhD	MCW, Anesthesiology	2025 – present
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Student Mentees (Residents & Graduate)

Michelle Kassel (PhD)	UWM	2018 – 2019
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Kevin Beitz (Resident)	MCW	2019 – 2023
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Pooria Bakheshi (Resident)	MCW	2020 – 2021
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Saagar Sheth (Resident)	MCW	2021 – 2025
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Marcus Cooley (Resident)	MCW	2022 – 2026
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Medical Students

Ying Qiu Zhou	MCW	2013 – 2014
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Ipsit Shah	MCW	2021 – 2024
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Ashley Perry	MCW	2021 – 2025
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Benjamin Maruska	MCW	2021 – 2024
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Curriculum Development

Fusion Curriculum	MCW (Anesthesiology)	2021 – 2024
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Adjunct Faculty	Carroll University	9/2013 – 5/2014
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PTH 560 - Pathology, PTH 405 - Neuroscience

AWARDS

Fellow Teacher of the Year MCW Anesthesia Residents 2018–2019

Outstanding Medical Student Teacher MCW 2018, 2020

Supportive Faculty Award MCW Dept. of Anesthesiology 2020–2021

Outstanding Educational Leader Award MCW 2025

PROFESSIONAL SOCIETIES

Society for Neuroscience in Anesthesia and Critical Care	since 2018
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American Society of Anesthesiologists	since 2014
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Congress of Neurological Surgeons	2012 – 2014
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American Association of Neurological Surgeons	2009 – 2014
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Society for Neuroscience

since 2003

JOURNAL REVIEWS / STUDY SECTIONS

NIH, Special Emphasis Panel: Language, Cognition, and Motor; ZRG1 BP-G(91)	1/2026
NIH, Neurotechnology and Vision Study Section; NV-C(15)	6/2025
NIH, Language and Communications Study Section; LCOM (Early Career Rev.)	2/2024
Journal of Neurosurgical Anesthesia (Editorial Board Member)	7/2023 – 7/2025
Journal of Neurosurgical Anesthesia (Reviewer)	since 5/2020
NeuroImage (Reviewer)	since 3/2020