

Marissa D'Souza, M.D.

Vascular Neurology & NIH StrokeNet Fellow · UC San Diego

San Diego, CA · (404) 556-2408 · marissadsouza2021@gmail.com · marissadsouza.com

PROFESSIONAL SUMMARY

Vascular neurology and NIH StrokeNet fellow at UC San Diego with a background in computer science, human-computer interaction, innovation, and entrepreneurship. I aim to combine clinical expertise with technical creativity and human-centered design to improve how stroke care is delivered, documented, and measured — from EHR workflow redesign and bedside decision support to patient-facing education tools, language access, and global health.

EDUCATION

Vascular Neurology Fellowship & NIH StrokeNet Fellow — University of California, San Diego (UCSD)	2025 – Present
Residency, Neurology — University of Michigan	2022 – 2025
Internship, Internal Medicine — University of Michigan	2021 – 2022
Doctor of Medicine (M.D.) — Mercer University School of Medicine	2017 – 2021
B.S. Computer Science (Human-Computer Interaction track), magna cum laude — Georgia Institute of Technology · Certificate in Entrepreneurship	2013 – 2017

QI & CLINICAL INFORMATICS PROJECTS

UCSD Stroke Workflow Redesign

UC San Diego · Mentor: Royya Modir, M.D. · 2026 – Present

- Surveyed residents and met with Epic build, stroke abstractors, analysts, and quality stakeholders to redesign stroke documentation around frontline workflow and downstream reporting needs.
- Designing a concise Stroke Navigator model for AIS/TIA, ICH, SAH, stroke mimics, and pending stroke workups, with role-aware data capture for neurology, NCCU, ED, nursing, pharmacy, and quality teams.
- Built new stroke documentation templates and SmartLinks with Epic to automate required field capture and reduce manual re-entry.
- Working to reduce the stroke flowsheet from 71 rows to 23 neurology-required fields by auto-populating existing EMR data, reassigning non-neurology-owned fields, and retiring low-value fields.
- Built a data dictionary mapping Navigator fields to Epic Row IDs and downstream quality/reporting pipelines, including TJC/eCQM, GWTG, Clarity, and SQL analytics.
- Designing stroke-specific order sets for TNK, heparin, admission, and discharge workflows, including dose automation, BPA consolidation, post-TNK linkage, stroke banner logic, and STK measure capture.
- Designing pre/post QI evaluation to measure documentation completion, time-to-data, abstraction burden, and resident experience.

Improving FAST-ED Performance at UCSD — Field Implementation & EMS Education

UC San Diego · Mentor: Thomas Hemmen, M.D., Ph.D. · 2025 – Present

- Built a retrospective EMS-arriving stroke-code cohort (>70 patients; paired subset with EMS narratives and hospital exams) comparing EMS-documented FAST-ED against neurologist-derived scoring for LVO prediction; analyzed the added value of EMS-obtainable risk factors (AF, OAC, DM, HTN, prior stroke/TIA) via logistic regression. Manuscript drafted; presented at International Stroke Conference 2026.
- Created and delivered the UCSD Neurosciences Field Care Audit teaching deck for EMS providers — covering SD County Protocol S-144 workflow, BE-FAST → FAST-ED severity scoring, motor vs. cortical sign documentation, LKN/witness/anticoagulant capture, prenotification scripts, and field teaching cases.
- Evaluating NLP/LLM classification of EMS narrative text for stroke and LVO prediction to support prehospital triage decisions.
- Developing easy-to-digest EMS reference resources on LKN vs. symptom onset, cortical sign documentation, anticoagulant capture, and prenotification.

MRI Safety-Screening Completion Flags

University of Michigan · 2022 – 2023

- Recognized recurrent delays when MRI safety screening remained incomplete despite pending neuroimaging orders.
- Designed and implemented an EMR-based flag system surfacing incomplete nursing MRI screening — reducing avoidable MRI delays and improving closed-loop communication between neurology, nursing, and radiology.

Documentation and Smart-Set Optimization for Stroke O:E Mortality Reporting

University of Michigan · 2023 – 2025

- Led documentation and SmartSet optimization to improve capture of clinical severity, comorbidities, and neurologic acuity relevant to observed-to-expected mortality reporting.
- Contributed to the Stroke Department's hospital-level recognition for major improvements in O:E capture.

Neuro ICU Rotation Restructuring

University of Michigan · 2022 – 2024

- Participated in restructuring of the Neuro ICU rotation to improve resident learning, workload balance, and role clarity.
- Surveyed neurology residents across multiple programs nationally to benchmark rotation structure and inform redesign.

PGY-4 Noon Conference Attendance Improvement

University of Michigan · 2024 – 2025

- Identified barriers to senior resident attendance at noon conference during high-volume clinical rotations.
- Worked with residency leadership to review attendance patterns, clarify expectations, and adjust scheduling and communication workflows to improve feasibility of participation.

TECHNOLOGY PROJECTS

StrokeTrials — Bedside Trial Screening & Research Reference PWA

UC San Diego · 2025 – Present

- Built a mobile-friendly, offline-capable progressive web app for bedside acute stroke triage and trial screening, deployed at the point of care.
- Implemented multi-path screening logic across acute ischemic, hemorrhagic, in-hospital, and post-stroke pathways, classifying patients as eligible / possible / ineligible based on LKW timing, NIHSS, vessel, imaging/perfusion, and consent inputs.
- Encoded eligibility logic for treatment pathways (TNK SOC, Extended Window/Wake-Up TNK, SOC EVT) and active stroke trials (SISTER, STEP LVO, STEP MeVO, TESTED, TELEREHAB-2, DISCOVERY) — with inclusion/exclusion review checklists built into each pathway.
- Built an automated communication module generating prefilled UCSD DALVO / BEMI message templates and Black Chat handoff text from screener inputs, with copy-to-clipboard for rapid prenotification and consult communication.
- Authored an interactive OPTION trial reference card with visual eligibility summaries, outcomes, and safety data — integrated into the suite for bedside lookup. WAKE-UP, DEFUSE-3, and ANGEL-ASPECTS cards planned.
- Architected as a static PWA (no backend, no login) for HIPAA-safe, network-independent use on shared clinical devices.

StrokeSpeak: Multilingual Acute Stroke Communication App — Aikens Innovation Academy

University of Michigan · 2024 – 2025

- Selected from a competitive applicant pool for the Aikens Innovation Academy — a Fast Forward Medical Innovation / Frankel Cardiovascular Center project-based course offering structured education, mentorship, and funding for clinician-led innovation in cardiovascular and stroke care.
- Conceived and led TranslateMD / StrokeSpeak, a multilingual acute-stroke communication app supporting neurologic assessment and triage in patients with limited English proficiency, spanning the EMS-to-treatment pathway (dispatch, prehospital notification, ED handoff, imaging, treatment decision, consent).
- Applied design-thinking methodology end-to-end: user interviews and stakeholder research, problem framing, iterative prototyping, and a working app prototype.
- Delivered a final pitch to Academy faculty and judges with stroke pathway diagram, app concept screens, and accompanying market/regulatory/business strategy.

OTHER WORK

Neurology Web Tools — Personal Portfolio

marissadsouza.com · 2022 – Present

Web Prototyping · Clinical Documentation · Neurology Education

- Neurology Exam Documenter — web prototype generating structured neurologic exam documentation from a guided input form (marissadsouza.com/neuro-exam-documenter).
- Diplopia Calculator — interactive web tool helping learners localize complex ocular motility findings through guided step-by-step reasoning (marissadsouza.com/diplopia-calculator).
- neurplexd — mobile-first web reference for common neurology residency protocols, optimized for bedside access (neurplexd.com).

Earlier Technical Work

Georgia Tech & Hackathons · 2016 – 2017

- VADERS (Value Analysis Data Extraction Research System) — developed a machine-learning–based software system to assess the quality of orthopedic reduction for ankle fractures (Georgia Tech, 2017).
- Food Renewed — prototyped an iOS app connecting retail food waste with consumer demand at the JP Morgan Chase Hackathon (2016).

RESEARCH PROJECTS

- FAST-ED Performance Improvement in LVO Triage — Research & Manuscript — NIH** 2025 – Present
StrokeNet Project · PI: Thomas Hemmen, M.D., Ph.D.
Developing and validating a risk-augmented FAST-ED approach to improve prehospital large-vessel occlusion identification, alongside NLP/LLM analysis of EMS narratives and EMS education and field documentation improvement (see QI & Clinical Informatics Projects).
- HoloStroke — Mixed-Reality Platform for Acute Stroke Care — UC San Diego · PI: Brett C. Meyer, M.D.** 2025 – Present
- Collaborator on mixed-reality platform standardizing acute stroke assessment and trainee education through interactive, case-based simulation.
 - Co-authored Holo-Stroke-II inpatient immersion publication (J Stroke Cerebrovasc Dis, 2026).
- Cardiac Abnormalities in Stroke Prevention and Risk of Recurrence (CASPR Registry) — Multi-center · PI: Christina Lineback, M.D.** 2023 – Present
- Multi-center study exploring cardiac and cervical arterial abnormalities as embolic sources in 2,000–5,000 cryptogenic stroke pts.
 - Co-author on secondary prevention and recurrent stroke analyses published in Neurology and JAHA; additional analyses in progress.
- Zambian Cohort of Healthy Aging and Dementia — Lusaka, Zambia · PI: Melissa Elafros, M.D., Ph.D.** 2023 – 2025
- Population-based prevalence study of dementia and associated risk factors in Lusaka, Zambia.
 - Rotated at University Teaching Hospital in Lusaka under Deanna Saylor, M.D.; performed cognitive evaluations in a Zambian community clinic as part of the study cohort.
- Coordinated Reset DBS for Binge Drinking Disorder — Stanford University · NREF Summer Research Fellow · PI: Casey Halpern, M.D.** 2018
- Analyzed neural signals from the nucleus accumbens to optimize stimulation parameters for early translational neurotechnology project.
 - Presented at AANS Annual Meeting (2019) and Medical Association of Georgia (2018).

CLINICAL TRIALS

STEP · FASTEST · DISCOVERY · SLEEPSMART · TELEREHAB-2 · SISTER

Responsibilities include screening, enrollment, and protocol-adherent follow-up for eligible acute stroke patients.

PEER-REVIEWED PUBLICATIONS

Research Investigations

- Siegler JE, D'Souza M, et al. Real-World Practice in Secondary Stroke Prevention following Embolic Stroke of Undetermined Source: Secondary Analysis of the CASPR Registry. *Neurol Clin Pract*. 2026. In press.
- Liu W, Shifflett B, McQuaid T, D'Souza M, et al. Holo-Stroke-II: Stroke care through stroke hologram teleportation — inpatient immersion. *J Stroke Cerebrovasc Dis*. 2026 Jan;35(1):108524.
- Pasupuleti D, D'Souza M, Ferguson A, et al. 3D-Printed Oral Disintegrating Films of Brain-Targeted Acetyl Salicylic Acid Nanoparticles for Enhanced CNS Delivery in Ischemic Stroke. *Pharmaceutics*. 2025 Nov 30;17(12):1547.
- Smith MM, Brorson JR, Badillo Goicoechea E, et al. (incl. D'Souza M). Intracranial Occlusion in Cryptogenic Stroke Is Not Predictive of Recurrent Ischemic Stroke: A Propensity-Score Matched Analysis of the CASPR Study. *J Am Heart Assoc*. 2025. PMID: 40996035.
- Siegler JE, Goicoechea EB, Penckofer M, et al. (incl. D'Souza M). Outcomes of Patients With Embolic Stroke of Undetermined Source Treated With Antiplatelet Agents or Anticoagulation. *Neurology*. 2025 Aug 12;105(3):e213876. PMID: 40609061.
- Gendreau JL, Kim LH, Prins PN, D'Souza M, et al. Outcomes After Cervical Disc Arthroplasty Versus Stand-Alone ACDF: A Meta-Analysis. *Global Spine J*. 2020 Dec;10(8):1046–1056. PMID: 32875831.
- D'Souza M, Chen KS, Rosenberg J, Elias WJ, et al. Impact of skull density ratio on efficacy and safety of MR-guided focused ultrasound treatment of essential tremor. *J Neurosurg*. 2019 Apr 26;132(5):1392–1397. PMID: 31026836.
- Nguyen L, Bowlds S, Juan D, et al. (incl. D'Souza M). Predictors of Pneumothorax (POP) Score. *Am Surg*. 2019 Sep 1;85(9):e470–e472. PMID: 31638542.

Reviews, Chapters & Editorials

- Delaney SL, Gendreau JL, D'Souza M, Feng AY, Ho AL. Optogenetic Modulation for the Treatment of Traumatic Brain Injury. *Stem Cells Dev.* 2020 Feb 15;29(4):187–197. PMID: 31559914.
- D'Souza M, Gendreau J, Feng A, Kim LH, Ho AL, Veeravagu A. Robotic-Assisted Spine Surgery: History, Efficacy, Cost, And Future Trends. *Robot Surg.* 2019;6:9–23. PMID: 31807602.
- D'Souza M, Macdonald NA, Gendreau JL, Duddleston PJ, Feng AY, Ho AL. Graft Materials and Biologics for Spinal Interbody Fusion. *Biomedicines.* 2019 Sep 26;7(4):75. PMID: 31561556.
- Kim LH, D'Souza M, Ho AL, et al. Anterior Techniques in Managing Cervical Disc Disease. *Cureus.* 2018 Aug 14;10(8):e3146. PMID: 30410821.
- Iyer A, D'Souza M, Steinberg GK. Embolization before stereotactic radiosurgery for brain arteriovenous malformations. *J Neurosurg Sci.* 2018 Aug;62(4):514–518. PMID: 29582980.
- Kolluru LP, Rizvi SA, D'Souza M, D'Souza MJ. Formulation development of albumin based theragnostic nanoparticles as a potential delivery system for tumor targeting. *J Drug Target.* 2013 Jan;21(1):77–86. PMID: 23036042.

Manuscripts Under Review

- Ravichandran S, Phan CN, D'Souza M, et al. Unilateral Cerebral Microbleeds: A Narrative Review and Proposed Diagnostic Framework. Submitted to *Neurology: Clinical Practice (CPJ-2026-300263)*; passed initial QC, 2026).
- Jazayeri SB, Phan C, Pirahanchi Y, et al. (incl. D'Souza M). Association of Early Transcranial Doppler Indices with Outcomes after Successful Endovascular Thrombectomy. Submitted to *Stroke (STROKE/2026/055645)*, 2026).
- Additional submissions under review: *Clinical and Applied Thrombosis Hemostasis (CATH-26-04-0159)*, 2026); *Journal of Neuroimaging* (2026); *Journal of Clinical Neuroscience* (2026); *JSCVD Holo-PACS* (2025).

Published Abstracts

- Aboul-Nour H, D'Souza M, et al. Abstract TP302: Single and combination antithrombotics for secondary prevention in ESUS: Secondary analysis of the CASPR Registry. *Stroke.* 2025;56(Suppl 1):TP302.

INVITED LECTURES & CONFERENCE PRESENTATIONS

Invited Lectures

International Stroke Conference Update — San Diego County Stroke Consortium	2026
Improving FAST-ED Performance at UCSD — NIH StrokeNet Committee	2026
Improving FAST-ED Performance at UCSD — San Diego County Stroke Consortium	2025
RCVS, PRES, and Inflammatory Vasculopathies —Vascular Neurology Fellow Board Series	2026
CAA-Related Inflammation (CAA-ri) — UCSD Neurovascular Conference	2025
Beyond Free Will: Neuroscience & the Law — UM Grand Rounds	2025
Neuroradiology Conference — Conference Leader, UM Neurology Residency	2023

Fellowship Didactics & Clinical Teaching

Advanced Neurovascular Board Review — UCSD Vascular Neurology Fellowship	2026
Endovascular Thrombectomy in Acute Ischemic Stroke — UCSD Fellowship	2026
Tenecteplase (TNK) for Ischemic Stroke Beyond the 4.5-Hour Window — UCSD Fellowship	2026
Non-Atherosclerotic Intracranial Arteriopathies — UCSD Fellowship	2026
CTP Core Detection vs MRI-Confirmed Infarction — UCSD Fellowship	2026

Conference Presentations

- D'Souza M, Geib T, Phan C, et al. FAST-ED in LVO Triage: The "Cortical Blind Spot" and How Risk Factors Can Help Improve Performance. Poster, International Stroke Conference (ISC), 2026.
- Phan C, Shifflett B, D'Souza M, et al. Prognostic value of early transcranial Doppler and mean arterial pressure in predicting hemorrhagic transformation and functional recovery after successful EVT in LVO stroke. ePoster, ISC, 2026.
- Hu T, Meyer DM, Agrawal K, Phan C, D'Souza M, et al. GULP: Guiding Understanding of Dysphagia and Rehabilitation Planning in acute stroke. ePoster, ISC, 2026.
- Khasiyev F, Borghei A, D'Souza M, et al. White matter disease and recurrent stroke in ESUS: a propensity-weighted analysis from the CASPR Registry. ePoster, ISC, 2026.
- Phan C, Meyer DM, Ravichandran S, Batarseh S, D'Souza M, et al. CYP2C19 genetic variability, ADP binding, and clopidogrel efficacy in acute ischemic stroke. ePoster, ISC, 2026.
- Khan F, Stretz C, Lewis S, D'Souza M, et al. The association between comprehensive evaluation in ESUS and stroke recurrence: a secondary analysis of the CASPR Study. ePoster, ISC, 2026.

- Geib T, Meyer BC, Banerjee A, D'Souza M, et al. Resource optimization and improved door-to-puncture times through FAST-ED score-based neurointerventional team activation: a county-wide retrospective analysis. Accepted, AAN Annual Meeting, 2026.
- D'Souza M. Impact of skull density ratio on efficacy and safety of MRgFUS treatment of essential tremor. Oral presentation, AANS Annual Meeting, San Diego, CA, 2019.
- D'Souza M. Optimizing coordinated reset within the nucleus accumbens to attenuate binge drinking. Oral presentation, Medical Association of Georgia House of Delegates, Jekyll Island, GA, 2018.
- D'Souza M, McGreal A, Akin M. Disparities in surgical cancer care from the patient-centered perspective. Joint MUSM/School of Pharmacy Research Symposium, Macon, GA, 2018.

LEADERSHIP & COMMITTEES

EHR Governance & Hospital Systems

HOA-Appointed Representative — MiChart Clinical Advisory Committee — *Michigan Medicine* 2024 – 2026
 Advised on clinical workflow, documentation, and EHR usability changes affecting house staff across Michigan Medicine.

HOA-Appointed Representative — House Officer Quality and Safety Council — *Michigan Medicine* 2023 – 2025
 Reviewed patient safety events, including EMR-related issues, and contributed to implementable solutions.

Committee Member — Stroke Mortality Task Force — *UM Department of Neurology* 2023 – 2024
 Reviewed stroke mortality cases and identified documentation, severity-capture, and process opportunities tied to observed-to-expected outcomes.

Department & Residency Leadership

Technology Chair — UM Neurology Residency Program 2023 – 2025
 Resident-elected role overseeing program technology infrastructure, digital workflow tools, and educational software for housestaff.

Social Media Representative — UM Neurology Residency Program (@umichneurores) 2022 – 2024

University & Medical School

Student Body-Appointed Representative — MUSM LCME Steering Committee 2019 – 2021

Chair — MUSM LCME Accreditation Independent Student Analysis Committee 2019 – 2021

Student Body President — MUSM Student Government Association 2019 – 2020

Savannah Campus President — MUSM 2018 – 2019

HONORS, AWARDS & GRANTS

NIH StrokeNet Fellow — UCSD · PI: Thomas Hemmen, M.D., Ph.D. 2025 – 2026
 Competitive NIH-funded research fellowship in vascular neurology.

GME Off-Site Rotation Travel Grant — University of Michigan Graduate Medical Education 2025
 Funding for ACGME-approved global neurology elective in Lusaka, Zambia.

Alpha Omega Alpha Honor Medical Society 2020 – Present

Neurosurgery Research and Education Foundation Summer Research Fellowship — Stanford University School of Medicine 2018
 For coordinated reset DBS for binge drinking disorder.

Award for Excellence in Service and Advocacy — Mercer University School of Medicine 2021

Award for Student Excellence in Research — Mercer University School of Medicine 2021

Jocelyn A. Rankin Excellence in Library Research — Honorable Mention — MUSM 2019
 For Robotic-Assisted Spine Surgery review.

Jocelyn A. Rankin Excellence in Library Research — Honorable Mention — MUSM 2019
 For cervical disc arthroplasty vs ACDF meta-analysis.

CERTIFICATIONS, LICENSURE, AFFILIATIONS & MEMBERSHIPS

Certifications & Licensure

California Medical License — 2025–Present · California Controlled Substances License — 2025–Present · NIHSS Certification — 2025 · MoCA Certification — 2025 · ACLS — 2021–Present · Michigan Medical License — 2021–2025

Hospital Affiliations

UCSD Medical Center – Hillcrest · UCSD Health La Jolla / Jacobs Medical Center / Sulpizio Cardiovascular Center · UCSD East Campus Medical Center · VA San Diego Healthcare System · El Centro Regional Medical Center · Inland Valley Medical Center · Rancho Springs Regional Medical Center

Professional Memberships

American Heart Association — Stroke Council (2025–Present) · Alpha Omega Alpha Honor Medical Society (2020–Present) · American Academy of Neurology (2020–Present) · American Medical Association (2017–Present) · Phi Delta Epsilon Medical Society (2017–Present)

TEACHING & SERVICE

Small Group & Bedside Teaching

Small Group Leader, UM Medical Student Localization Rounds	2023 – 2025
Small Group Leader, MUSM Clinical Neurosciences	2021
Peer Tutor, MUSM Pre-Clinical Peer Instructors	2020 – 2021
UM Neurology Resident Journal Club	2023 – 2025
Neuroscience Block Review Sessions, MUSM	2020 – 2021

Volunteer & Community Outreach

Special Pops Tennis & Pickleball Coach	2017 – 2020
Coached tennis and pickleball clinics for individuals with intellectual disabilities.	
COVID-19 Response Team Founder, Georgia	2020
Coordinated statewide student initiatives including grocery delivery for immunocompromised patients, contact tracing, blood drives, and PPE fundraisers.	
GA Department of Public Health COVID-19 Volunteer & Contact Tracer	2020
Helped develop and implement contact tracing protocols later used in public health departments state- and nationwide.	
Rock n' Roll Savannah Half Marathon Fundraiser & Medical Volunteer	2018 – 2019
Fundraised \$660 for St. Jude Children's Research Hospital; served as medical volunteer in 2018.	
Spinal Cord & Brain Injury Rehabilitation Hospital Volunteer & Fitness Coach	2016 – 2018
Provided longitudinal fitness support for four pts recovering from spinal cord and traumatic brain injury.	
Missionaries of the Poor of Manila Volunteer	2017
Tutoring, meal preparation, and facility upkeep at Manila shelter, Philippines.	

TECHNICAL SKILLS

Clinical Informatics & EHR — Epic (SmartPhrases, SmartLists, SmartLinks, SmartForms, Stroke Navigator, Diagnosis-Aware Notes/DAN, NoteWriter, flowsheet design)

HCI, Frontend & Design — Figma · Canva · Adobe Creative Suite · HCI methods · user interviews · prototyping

Quality & Data — TJC stroke metrics · GWTG-Stroke · eCQM · SlicerDicer

Programming Languages — Python · JavaScript · Java · HTML/CSS · MATLAB · R

AI / Generative AI / Data — Generative AI · LLM-based clinical text extraction · NLP · logistic regression · machine learning

3D Modeling — SolidWorks · Blender

INTERESTS

Stroke systems of care · Digital health · Clinical informatics · AI/NLP for clinical workflow · UI/UX design · Global neurology & health equity · Pickleball & tennis