

UCSF HEALTH

Neurovascular Disease and Stroke Center

Providing initial evaluations, second opinions and follow-up care for the prevention, diagnosis and treatment of stroke and other neurovascular conditions.
ucsfhealth.org/neurovascular



UCSF TRANSFER CENTER: (415) 353-9166

To transfer urgent and nonurgent adult neurovascular patients.

UCSF Weill Institute for
Neurosciences

Contact Us



- **UCSF Transfer Center** (for adult patients)
Phone: (415) 353-9166
- **UCSF Access Center**
(for maternal, neonatal and pediatric patients)
Phone: (877) 822-4453 or (877) UC-CHILD
Inpatient fax: (415) 353-1323
Outpatient fax: (415) 353-4485
- **UCSF International Services**
Phone: (415) 353-8489
Fax: (415) 353-3672
Email: ims@ucsf.edu
- **Cerebrovascular Neurosurgery**
Phone: (415) 353-2529
Fax: (415) 353-2889
- **Neurointerventional Radiology**
Phone: (415) 353-1863
Fax: (415) 353-8606
- **Neurovascular Disease and Stroke Center**
Phone: (415) 353-8897
Fax: (415) 353-8705



Comprehensive, Personalized Options for Neurovascular Treatment

The Neurovascular Disease and Stroke Center at UCSF Weill Institute for Neurosciences provides patients an integrated, interdisciplinary approach to screening, prevention, diagnosis and treatment for stroke. We also specialize in conditions that put patients at high risk for stroke, including brain aneurysms, arteriovenous malformations, cavernous malformations, dural arteriovenous fistulas and carotid disease.

We are a hub for innovative education, training and cutting-edge clinical and scientific discovery. Our research and leadership in the development of best practices and new treatments improve stroke care around the globe.



Neurovascular Clinical Trials at UCSF

UCSF participates in and leads many clinical trials and protocols that have resulted in important technological and treatment advances for neurovascular patients around the world.

For more information, please visit clinicaltrials.ucsf.edu.

Second Opinions

The UCSF neurovascular team often provides second opinions. To get a second opinion on a case, please contact one of the neurovascular team offices listed on the previous page.

The UCSF Neurovascular Disease and Stroke Center is a:

- Joint Commission-certified Comprehensive Stroke Center – the only center in San Francisco with this designation.
- Clinical Center of Excellence for the treatment of cerebral cavernous malformations, as designated by the Angioma Alliance.
- Hereditary Hemorrhagic Telangiectasia Center of Excellence, as designated by the HHT Foundation International, Inc. (now Cure HHT).
- Regional Coordinating Center for the National Institutes of Health StrokeNet, which develops, promotes and conducts high-quality, multisite clinical trials for stroke prevention, treatment and recovery.

Stroke

Our Joint Commission-certified Comprehensive Stroke Center offers the following benefits:

- 24/7 neurovascular coverage
- An integrated, interdisciplinary approach to care
- Advanced imaging techniques
- Multidisciplinary expertise delivering team-based care
- A dedicated transfer bed, enabling quick acceptance of stroke transfers

Hemorrhagic Strokes or Subarachnoid Hemorrhage

For hemorrhagic strokes or subarachnoid hemorrhage, our interdisciplinary team offers comprehensive evaluations that direct patients to the most appropriate treatment for their particular condition and anatomy. We treat the full range of cases and have extensive experience with endovascular coiling, balloon-assisted coiling, stent-assisted coiling, flow diversion, surgical clipping, and bypass and aneurysm exclusion/trapping.



Ischemic Stroke

For ischemic stroke, we can rapidly evaluate each patient and determine how much at-risk brain tissue is salvageable with effective treatment of the arterial blockage. If imaging indicates that there is a large-vessel occlusion, even intravenous (IV) tissue plasminogen activator (tPA) may be unlikely to resolve a blockage, so our endovascular experts with outstanding embolectomy experience and access to the latest devices are ready to take over. Our experience with embolectomy is rooted in our faculty's contributions to recent studies that proved that lifesaving stroke treatment can be extended to as many as 24 hours after onset. In select cases of intracranial atherosclerosis, if a stenosis seems likely to cause recurrent symptoms despite maximal medical therapy, our endovascular experts can evaluate whether intracranial angioplasty and/or stenting may be appropriate; and if a blockage seems likely to cause recurrent symptoms, expert neurosurgeons can perform extracranial-intracranial bypass surgery to restore blood flow.

How to Streamline Treatment for Ischemic Stroke

Protocols developed in coordination with prehospital emergency medical system providers allow incoming patients to go directly from the ambulance to our computed tomography (CT) scanners, and four dedicated neurointerventional radiology suites enable us to triage patients directly to brain imaging and then to the angiography suite for embolectomy. We are often able to evaluate, obtain neuroimaging and administer IV tPA within 25 minutes of arrival and to transfer patients to the angiography suite to re-establish blood flow within the crucial next hour, which can enable patients to achieve outstanding post-procedure functional outcomes.

If you suspect that your adult patient has a large-vessel-occlusion acute ischemic stroke, please call our **Transfer Center at (415) 353-9166** and make it clear that you have identified a "hyperacute, large-vessel-occlusion stroke for possible thrombectomy." This will immediately activate our expedited stroke patient transfer protocol and streamline your transfer to our neurovascular service.

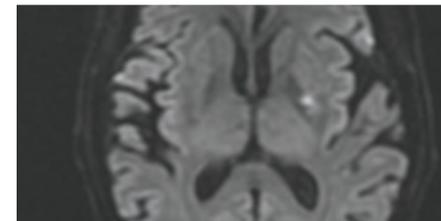
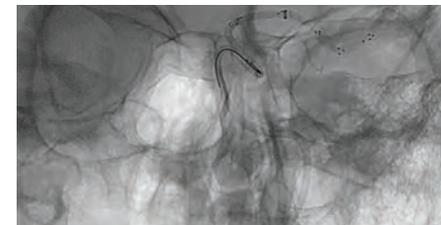
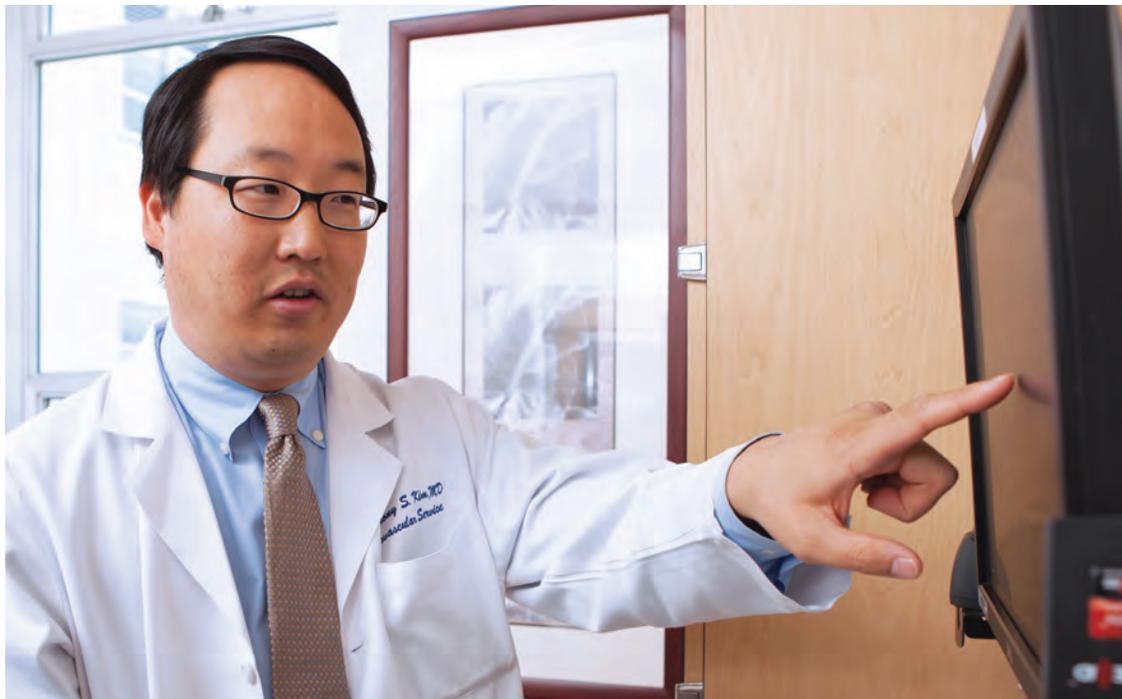
Case Study: Embolectomy

While playing golf in San Francisco, 78-year-old Donald Onken experienced a stroke that paralyzed his right side and rendered him unable to speak.

The incoming ambulance alerted the Emergency Department that a possible stroke patient was en route, so vascular neurologist and Medical Director of the UCSF Stroke Center Anthony S. Kim, MD, MAS, and his team were ready. Upon the patient's arrival, the team completed an initial evaluation and CT scan and administered IV tPA within 28 minutes. While IV tPA is the first-line treatment for stroke, Dr. Kim quickly identified that the blockage in the left middle cerebral artery would likely require thrombectomy. Within 30 minutes, neurointerventional radiologist Steven Hetts, MD, was performing an emergent embolectomy and was able to restore flow in Mr. Onken's left middle cerebral artery. By the time he came out of intensive care, about 36 hours later, Mr. Onken had made a full recovery. Less than six weeks later, he was playing golf regularly again.

"I don't know how to measure care – but it seemed fantastic. When that ambulance stopped, people were swarming around me, and I was confident I was being taken care of. Everybody who came into my room was so courteous and polite and professional. It was the best experience you could have considering I was in a hospital."

Donald Onken





Aneurysms

Endovascular coiling is a cutting-edge and minimally invasive option for treating intracranial aneurysms. More complex or wide-necked aneurysms, however, may still require open surgery. We offer deep experience with both approaches and have a humanitarian device exemption to use numerous intracranial stents and related adjunctive devices for stent-assisted coiling. We have an active clinical research program to better understand how best to care for patients with aneurysms, including a protocol to evaluate the use of infliximab, a monoclonal antibody, for the treatment of dolichoectatic vertebrobasilar (DVB) aneurysms that are otherwise inoperable.

Case Study: Endovascular Coiling

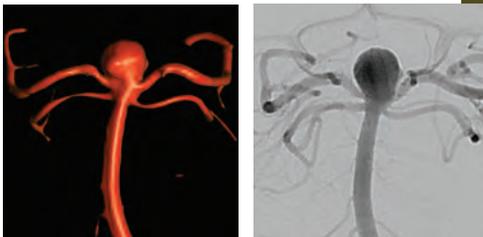
“It was kind of scary, but they mapped everything out, and I knew I was in the right place because of how professional and knowledgeable they were. That stroke turned out to be a stroke of luck, and I believe the decision to go to UCSF saved my life.”

Sylvia Prater

Seventy-year-old Sylvia Prater, formerly a professional banjo player, didn't realize she'd had a stroke until she went to her primary care doctor in Windsor, California, concerned about some vision problems.

A series of tests revealed the stroke, but also found an unruptured basilar tip brain aneurysm. Ms. Prater knew of UCSF's reputation and decided that was the place she wanted to go. Vascular neurologist Karl Meisel, MD, MA, examined her and optimized her stroke prevention

regimen and then referred her to neurointerventional radiologist Steven Hetts, MD, who treated her challenging aneurysm endovascularly using a PulseRider aneurysm neck reconstruction device and coiling. With the exception of some compromised vision, she has made a full recovery.



Case Study: Surgical Clipping

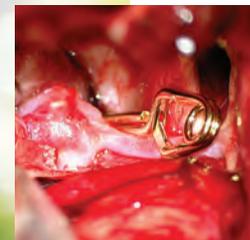
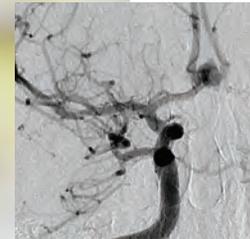
Mary Lehman arrived at UCSF with a subarachnoid hemorrhage caused by a ruptured cerebral aneurysm involving the anterior communicating artery.

Neurosurgeon Adib Abl, MD, performed the brain surgery needed to clip the aneurysm. Neurologists and neurosurgeons cared for Ms. Lehman in the Neurointensive Care Unit (Neuro ICU), and she received endovascular treatment for cerebral vasospasm by the

neurointerventional team to prevent secondary strokes. Dr. Abl then performed cerebral shunt surgery to treat hydrocephalus, a common complication of aneurysm rupture. Ms. Lehman has made a full recovery.

“The UCSF team not only provided me with the best medical care possible, but guided and enabled my loved ones to make the best decisions on my behalf.... I owe Dr. Abl and his team a world of gratitude for the care and miraculous recovery I have made.”

Mary Lehman



Arteriovenous Malformations

The gold standard for curative obliteration of arteriovenous malformations (AVMs) is open surgery. In order to make the surgery as safe as possible, we perform preoperative endovascular embolization using glues or other embolic agents. For AVMs that are in locations that are not optimal for surgery, we also offer stereotactic radiation in the form of Gamma Knife surgery. For inoperable cases, Daniel Cooke, MD, is leading a clinical trial testing the use of Avastin – an antiangiogenic drug – to reduce the proliferation of blood vessels in AVMs.

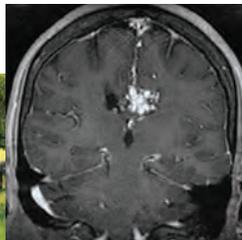
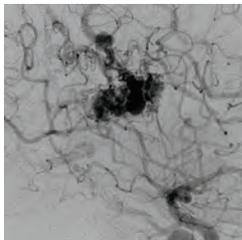
Case Study: AVM Surgery

Julie Strange is a 64-year-old woman who presented at a hospital near her Oroville, California, home with blinding headaches and confusion that had lasted for more than a week.

When a CT scan revealed bleeding in the brain, physicians sent her by ambulance to UCSF Medical Center, where an MRI, another CT and an angiogram revealed a left-sided brain AVM, grade 4, spread across the ventricle and the cingulate gyrus and corpus callosum. Neurosurgeon Adib Abl, MD, initiated the delicate surgery from the right side using an interhemispheric approach, in which he cut through the falx cerebri to remove the AVM. Six weeks later, Ms. Strange is recovering steadily. A retiree, she is back to daily walks with her neighbor and regular swims at the local pool.

“I was born and raised on a ranch, and it’s hard for me to not get up and do things...but I [realize now] that it takes time. You need patience to get better, and the group at UCSF was very patient; they were wonderful.”

Julie Strange



Case Study: Hereditary Hemorrhagic Telangiectasia (HHT)

While accompanying her brother to a Santa Cruz, California, hospital to have his AVM addressed, Lisa Cotter was told by a physician that she should be seen for what appeared to be telangiectasias on her lips.

The 52-year-old mother of two did some homework and decided the best place to get diagnosed and treated was the HHT Center of Excellence at UCSF. For more than two years, the UCSF Hereditary Hemorrhagic Telangiectasia Center has managed her care, including performing Gamma Knife radiosurgery to address a brain AVM, procedures to address AVMs in her lungs and ongoing monitoring. In addition, the center manages Ms. Cotter's teenage children, both of whom have been diagnosed with HHT. Ms. Cotter's daughter has received treatment for lung AVMs, and her son has also had Gamma Knife surgery for a brain AVM. The center is also monitoring both teens closely.

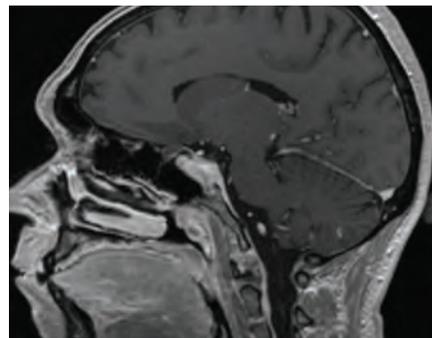
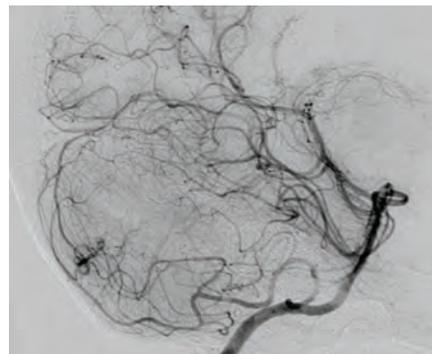
“The people at UCSF are wonderful. The coordinator is outstanding and makes sure we can all be seen in one day. I’ve always been heard – and my children have always been heard. The whole team is like an extended family.... We’re so grateful we’ve had the help we’ve had and that we’re not lost in the shuffle.”

Lisa Cotter

HHT CENTER OF EXCELLENCE

The UCSF Hereditary Hemorrhagic Telangiectasia Center is Northern California's only facility specializing in the comprehensive screening, diagnosis and treatment of hereditary hemorrhagic telangiectasia (HHT). The HHT Foundation International, Inc. (now Cure HHT) has designated us a Center of Excellence for treatment of this complex genetic disorder.

Because HHT can affect multiple parts of the body, our team includes experts in the fields of interventional and neurointerventional radiology, pediatrics, medical genetics, hematology, otolaryngology, head and neck surgery, cardiology, dermatology, gastroenterology, neurology, neurological surgery and pulmonology. We trace each patient's genetic family history of HHT and work closely with our UCSF HHT team and the patient's referring physician to develop a treatment plan.



Cavernous Malformations

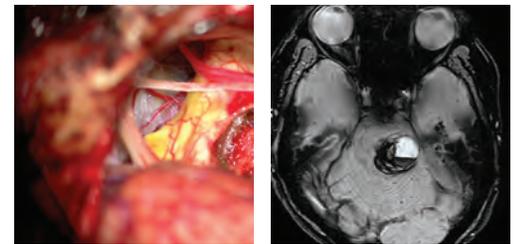
In 2018, the Angioma Alliance named UCSF a Clinical Center of Excellence in Cerebral Cavernous Malformation (CCM), the only institution in California, and one of only seven in the nation, to earn this designation. The Angioma Alliance recognizes centers that provide high-quality interdisciplinary care for adult and pediatric patients with both sporadic and familial CCM.

Led by Chief of Vascular Neurosurgery Adib Abla, MD, and vascular neurologist and neurointensivist Nerissa Ko, MD, the center includes a coordinated team of nationally recognized experts from multiple specialties with extensive experience in CCMs. UCSF is also home to one of the world's foremost clinical research programs for cerebrovascular malformations, the UCSF Center for Cerebrovascular Research (CCR).

Case Study: CCM Diagnosis and Treatment

In 1993, while still in college, Ivan Trinh had a stereotactic procedure to treat an inoperable pilocytic astrocytoma in his brain stem.

After college, Mr. Trinh married, had children and pursued a career in biotechnology sales; all seemed well until, in 2007, new symptoms appeared. Struggling to get a clear diagnosis in Southern California, he arrived at UCSF, where Chair of Neurological Surgery Mitchel Berger, MD, correctly diagnosed a rare, radiation-induced capillary telangiectasia, a variant of a cavernous angioma. Mr. Trinh received treatment – drainage and removal of a blood clot – in Southern California, but when symptoms returned in 2018, he returned immediately to UCSF. The diagnosis was again a capillary telangiectasia. Neurovascular surgeon Adib Abla, MD, and Dr. Berger performed the delicate surgery, which involved accessing the posterior aspect of the midbrain region of the patient's brain stem through a supracerebellar infratentorial approach. The surgery allowed removal of the capillary telangiectasia, the cyst and tumor cells around them. This enabled a pathology report, which confirmed that the tumor itself was still inactive. Today, Mr. Trinh is nearly fully recovered – and extremely grateful to the UCSF team.



“They did an absolutely phenomenal job. I was impressed with everybody from the surgeons to the nurses to the assistants; they genuinely care about their patients. I have no question that UCSF is the number one place to go.”

Ivan Trinh

Ischemic and Carotid Disease

Occlusive diseases of the cervical arteries and intracranial arteries cause decreased blood flow to the brain, putting people at risk for ischemic stroke. We treat the following conditions with the treatments specified:

- Common forms of occlusive disease, such as atherosclerotic stenosis of the carotid artery – surgery or stenting
- Rarer forms of occlusive disease, such as intracranial atherosclerosis – stenting or bypass
- Moyamoya disease – synangiosis or bypass

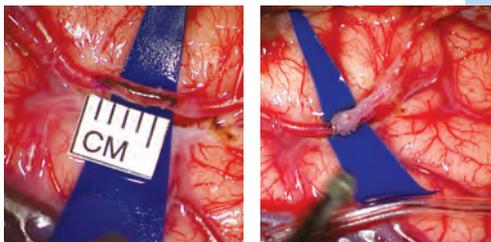
Case Study: Moyamoya Disease

“The disease and recovery have taken an emotional toll, but we have been impressed with the people and departments at UCSF; Dr. Abla was particularly caring; he took time with us, and we never felt we were just a patient coming through.”

Janine Ragan

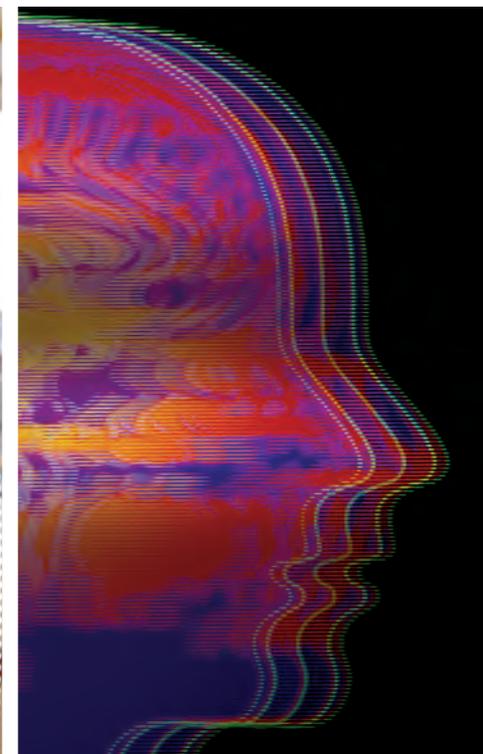
After surviving two strokes and being diagnosed with moyamoya disease, a rare, progressive cerebrovascular disorder caused by blocked arteries at the base of the brain, Janine Ragan, who lives in Eureka, California, came to UCSF to have bypass surgery aimed at correcting the condition.

Neurosurgeon Adib Abla, MD, performed two brain bypass surgeries – one for the left side, one for the right – with monitoring and follow-up by vascular neurologist and Medical Director of the UCSF Stroke Center Anthony S. Kim, MD, MAS. Ms. Ragan – who has eight children, ranging in age from mid-teens to late 20s – is steadily recovering after her long stay in the ICU.



Dural Arteriovenous Fistulas

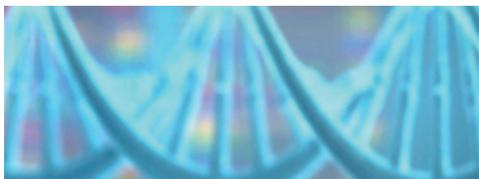
We are world leaders and among the largest-volume centers in the United States for diagnosing and treating dural arteriovenous fistulas (DAVFs) – rare, abnormal connections between arteries and veins on the surface of the brain, which divert blood from normal paths. Some DAVFs are life-threatening and may cause headaches, seizures or strokes if they rupture. Others are benign and go undetected until discovered during treatment for other conditions. Our team includes neurologists, neurosurgeons and neurointerventional radiologists who are expert in identifying DAVFs and designing the best possible treatment.





The UCSF Center for Cerebrovascular Research

Our groundbreaking UCSF Center for Cerebrovascular Research (CCR) is an interdisciplinary group that pursues integrative studies of cerebrovascular disease by using the tools of cell biology, animal models, human genetics, epidemiology and treatment outcomes research. The center's main area of focus is vascular malformations of the brain, which are an important cause of hemorrhagic stroke and include arteriovenous malformations, intracranial aneurysms and cavernous malformations.





1964

First use of the microscope in operations for intracranial aneurysms

1981

Introduced silicon balloon embolization for aneurysms

1986

Initiated electrothrombosis for carotid-cavernous fistula

1989

Among the first in the world to treat dural arteriovenous fistulas transvenously

1991

Pioneered the use of detachable embolic coils to treat brain aneurysms through the blood vessels

Birthmarks & Vascular Anomalies Center established

1994

Adult Neuro ICU established with neurocritical care

1997

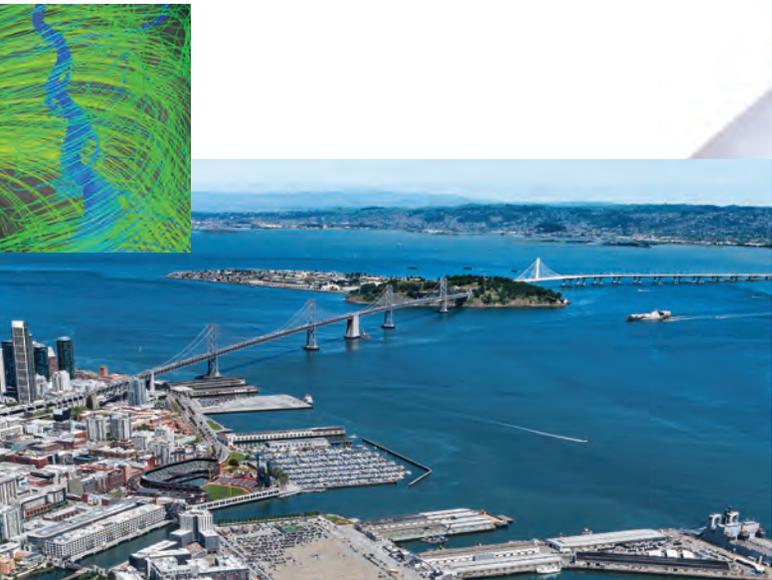
Multidisciplinary neurovascular case conference established

First in the world to place an intracranial stent in a ruptured cerebral aneurysm

2000

Center for Cerebrovascular Research founded

Important Milestones in Neurovascular Disease and Stroke Care at UCSF



2005

First center in San Francisco to be certified by the Joint Commission as a Primary Stroke Center

2008

Established cerebrovascular surgery observership program

2009

Established the Brain Vascular Malformation Consortium

2012

Established the Skull Base and Cerebrovascular Laboratory

2013

Selected by the National Institutes of Health as one of 25 StrokeNet Regional Coordinating Centers

2014

Only hospital in Northern California to be designated a Hereditary Hemorrhagic Telangiectasia Center of Excellence

2015

Established the first multidisciplinary pulsatile tinnitus clinic

2018

First center in California to be designated a Clinical Center of Excellence in Cerebral Cavernous Malformation

2020

Certified as a Comprehensive Stroke Center by the Joint Commission

UCSF Medical Center is ranked best in the West and is #2 in the nation for neurology and neurosurgery.



[ucsfhealth.org/neuro](https://www.ucsfhealth.org/neuro)
[ucsfhealth.org/neurovascular](https://www.ucsfhealth.org/neurovascular)



UCSF Health strives to provide equal access to our facilities and services for our patients with disabilities. For more information or assistance, please call Patient Relations at (415) 353-1936 or visit www.ucsfhealth.org.

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