



2020
IN REVIEW

&

LOOKING
FORWARD
TO **2021**

**PACIFIC
NEUROSCIENCE
INSTITUTE®**

THINK NEURO. THINK PNI.



KNOWING YOUR BRAIN CARE is in the right hands

**COMPLEX NEUROLOGICAL
CONDITIONS** require
specialized care by seasoned
experts.

**PACIFIC NEUROSCIENCE
INSTITUTE** is a local and
global destination for
personalized innovative care
using minimally invasive,
maximally effective treatments
focused on quality of life.

THINK NEURO. THINK PNI.



Santa Monica 310-582-7640 | South Bay 424-212-5361
PACIFICNEURO.ORG

**PACIFIC
NEUROSCIENCE
INSTITUTE®**

To say the least, 2020 was an unusual year. Against this backdrop, neurological diseases did not stop and neither did we at Pacific Neuroscience Institute. Along with our affiliated hospitals, Providence Saint John's Health Center and Little Company of Mary Medical Center, we were able to quickly implement strict COVID-19 safety protocols for patients, visitors and staff, and begin virtual consultations so that we could continue to provide the highest quality of care. We extend our profound thanks to all the devoted caregivers at PNI and beyond who have risen to this extraordinary challenge.

To all of our supporters, we thank you. We have been incredibly fortunate in the support of our Brain Health and Brain Tumor programs. We especially would like to thank Will & Cary Singleton for their \$40M transformational gift to the Brain Health Center.

We've entered 2021 with a deep commitment to treating our patients at our ten **centers of excellence**, doing groundbreaking research, providing innovative clinical trials, and above all striving for excellence in all we do.

Here are HIGHLIGHTS of our accomplishments in 2020 and a look at what we have planned for 2021.

Think Neuro. *Think PNI.*

Sincerely,

**Daniel F. Kelly, MD, Chester F. Griffiths, MD, FACS,
Santosh Kesari, MD, PhD, and Howard R. Krauss, MD**
Pacific Neuroscience Institute Founders



PNI Mission

- ▶ Provide personalized, precision multidisciplinary patient care
- ▶ Advance the neurosciences and promote brain health through novel research and innovative clinical trials
- ▶ Train the next generation of clinician and research neuroscientists
- ▶ Educate patients and the community at large on vital neuroscience issues

2020 BY THE NUMBERS

NEUROSCIENCE CLINICAL CARE



- 10** Centers of Excellence
- 34** Medical Group Faculty
- 15** Associate Medical Group Faculty
- 19** Nurse Practitioners and Physician Assistants
- 6** Medical Group Outpatient Clinics
- 4** Providence Hospitals Affiliated with PNI Medical Group Physicians
- 43,466** PNI Clinic Visits
(11,254 Virtual Visits / 32,212 In-office Visits)
- 1,973** Medical Group Surgical Procedures
(531 Neurosurgical / 805 NeuroIR + Neurovasc / 637 ENT & Ophtho)

RESEARCH & CLINICAL TRIALS



- 25** Peer-Reviewed Publications and In Press
- 5** Grants
- 7** Clinical Trials and Expanded Patient Protocols
- 104** Clinical Trial Patients Enrolled and Consented

TRAINING & CONTINUING MEDICAL EDUCATION



- 21** Neuro-Anatomy Formal Dissections
- 1** Neurosurgical Fellow in Training
- 3** Movement Disorders Fellow in Training (Virtual & In-person)
- 16** Medical Assistants-In-Training
- 7** Neuroscience Interns (Undergraduate and Graduate)

PATIENT & COMMUNITY EDUCATION



- 160** Patient Support Group Sessions (Virtual & In-person)
- 10** Community Events (Virtual & In-person)
- 99** Blogs
- 30** Podcasts
- 12** Newsletters
- 227** Videos (YouTube)
- 934** Social Media Posts (LinkedIn, Twitter, Facebook & Instagram)
- 5,485** Social Media Followers

FOUNDATIONS SUPPORT NEUROSCIENCE PROGRESS & INNOVATION



- \$42,491,677** Funds Raised in Partnership with Saint John's Foundation
- 10** PNIF Board Members
- 4** Special Advisors



NEUROSCIENCE CLINICAL CARE

Despite the pandemic, PNI providers achieved multiple milestones in **2020**.

- PNI and Saint John's Health Center were recognized by US News & World Report with High Performing Hospitals (Neurology & Neurosurgery) and Best Regional Hospitals awards.
- Our PNI neurosurgeons at Saint John's Health Center and Little Company of Mary Medical Center collectively performed over 300 brain tumor operations for both benign and malignant **brain tumors** and skull base tumors. In coordination with the Providence regional transfer center, both sites are functioning as brain tumor regional referral centers.
- Since 2010, our PNI neurosurgeons and ENT surgeons crossed a milestone of operating on over 500 patients with a pituitary adenoma with a fully endoscopic endonasal approach, and our median hospital length of stay has dropped to just one day.
- PNI neurosurgeons using minimally invasive keyhole craniotomies were able to reduce our median hospital length of stay to only two days, with many patients going home one day after surgery.
- Our PNI stroke team treated over 800 stroke and other neurovascular patients across Southern California, the largest collective volume in all of Southern California. Our 6 neuro-interventional radiologists work across 4 stroke centers at our Southern California Providence affiliates (Saint John's Health Center, Little Company of Mary Medical Center, Holy Cross Medical Center, Saint Joseph's Medical Center).
- The Brain Health Center team continued to provide essential mental health care for patients with dementia, memory loss and other cognitive impairments, transitioning to mostly virtual consultations but exceeding patient volumes compared to 2019.
- The Movement Disorders Center with its clinic now joining the Brain Health Center at 1301 20th Street, Santa Monica, became the first among Providence clinics to implant the novel Percept™ PC neurostimulator with BrainSense™

technology Deep Brain Stimulation device for Parkinson's disease; first to implant amygdala DBS for pain and anxiety worldwide; and first to implant axillary nerve stimulator using the Bioness device at Providence to treat post-stroke shoulder pain. The Syn One biopsy, a novel method to diagnose Parkinson's disease and related conditions, was introduced to improve diagnostic accuracy.

- Our Psycho-oncology program led by Dr. Shanthi Gowrinathan continued to provide much needed emotional support to cancer patients at Saint John's Health Center.
- Our **Treatment & Research In Psychedelics (TRIP)** program opened on the 5th Floor of Saint John's Medical Plaza building at 1301 20th Street. Led by Dr. Keith Heinzerling, this innovative program has been providing ketamine-assisted psychedelic therapy for patients. It will be

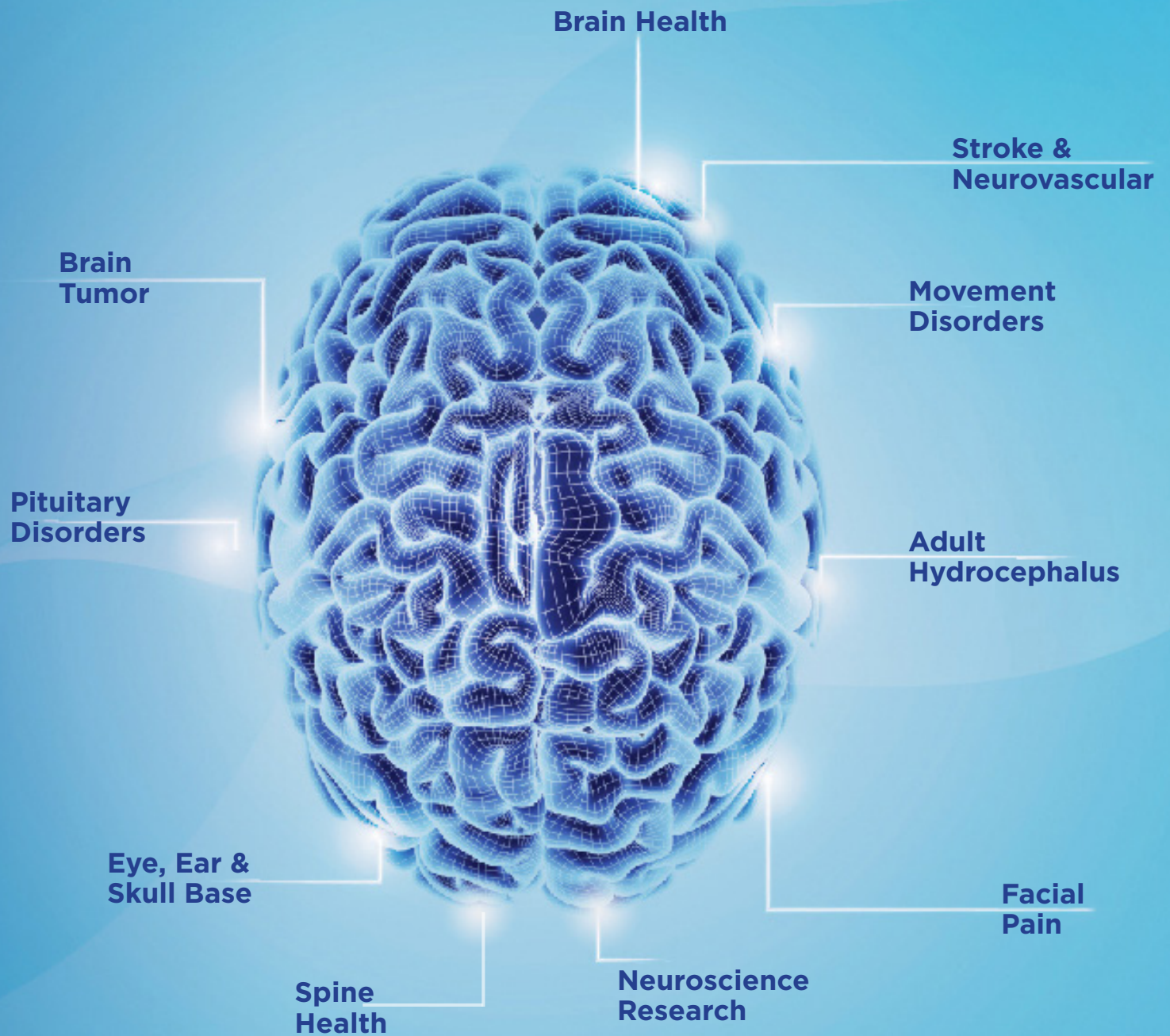
starting psilocybin-assisted clinical trials for patients with alcohol use disorder and hopefully soon for depression, and other related areas of mental and emotional distress such as anxiety and PTSD.

- The Neurodiagnostic Treatment Suite on the first floor of the PNI building at 2125 Arizona Ave, was completed and will start infusion therapies for a variety of neurological conditions including MS and brain tumors in April 2021.
- **NEW FACULTY HIGHLIGHTS:** PNI was fortunate to be able to expand our team of neuroscience experts including our new specialists in multiple sclerosis Dr. Barbara Giesser, facial paralysis Dr. Amit Kochar and in neuro-oncology Dr. Akanksha Sharma. Dr. Neil Martin joined the PNI Faculty (see more below). Dr. Howard Krauss was elected Vice-President of the Medical Board of California.



2021 promises further strengthening of programs. We anticipate further expanded services in the realm of neuroinflammatory diseases with a clinical Autoimmune Disease Program at Little Company of Mary. The Alzheimer's, dementia and cognitive decline services will continue to grow. We will be expanding neuro-ophthalmic, audiology and pituitary hormonal testing into the Brain Health Center, advancing the clinical utility of retinal, hearing and endocrine evaluations in the optimal management of patients with memory, cognitive and balance issues.

PNI'S CENTERS OF EXCELLENCE



CLINICAL TRIALS & RESEARCH



2020's roster of neuro-oncological and neurological clinical trials was robust. Clinical studies began or continued for a wide range of neurological tumors including gliomas and glioblastomas, chordomas, meningiomas, solid tumors, and brain metastases. Trials also ran for essential tremor, Alzheimer's disease, Cushing Syndrome, as well as quality and outcomes research related to brain tumor diagnoses. In total, PNI and the Saint John's Cancer Institute opened 7 more clinical trials for enrollment during 2020, including a new trial for IV stem cells infusion for Alzheimer's disease. Several investigators were awarded research support from the Dana Foundation, Uncle Kory Foundation, and Matthew Larson Foundation. Our PNI faculty had 25 peer-reviewed neuroscience **publications** or papers in-press including one of the **largest series of keyhole eyebrow craniotomy** for brain tumor removal by Ansari et al.



2021 has 18 actively recruiting clinical trials so far with more to come. With the expansion of the TRIP team, we're poised to begin a psilocybin clinical trial for alcohol use disorder in March. We have been selected as a phase 2 site for the Usona depression psychedelic-assisted clinical trial using psilocybin. Family caregivers often bear the brunt of profound loss of loved ones due to COVID-19, cancer, dementia, and other diseases, and we are working to address prolonged grief through a forthcoming psychedelic-assisted clinical trial protocol. The Alzheimer's and dementia programs will continue to grow, adding new studies to address early detection and risk profiling, and lifestyle interventions for prevention and mitigation of dementia. We are preparing to publish multiple manuscripts that are currently in progress. Finally, several new grant applications will also be submitted.



TRAINING & CONTINUING MEDICAL EDUCATION

2020 was still able to provide training and education opportunities for our 2020-21 clinical neurosurgical fellow, and seven neurosurgery research interns.

The state-of-the-art Neuroanatomical Surgical Skills Laboratory is now in its new location on the second floor of the Saint John's Cancer Institute (formerly known as the John Wayne Cancer Institute). It is an advanced training facility for **minimally invasive surgery**, neuroanatomical dissections, and technology and approach advancements in keyhole surgery. Our experts were hosts to two courses and an exciting collaboration began with Brainlab AG for cadaveric and clinical research.

PNI professors were able to present at virtual specialty forums on local and national levels.

The Medical-Assistants-In-Training (MA-T) program through the Pacific Eye, Ear & Skull Base Center had another successful year.

2021's PNI fellowships will extend into movement disorders, neuro-oncology and ENT/otolaryngology, and we will carefully re-open the PNI Neuroscience Internship and Observation Programs. A number of other educational webinars will take place in collaboration with other institutions. PNI neurosurgeons and neuro-oncologists will be featured presenters in Seattle Science Foundation's educational video series. The 12th annual PNI Neuroscience Nursing Symposium will take place as a virtual event in Fall.

PATIENT & COMMUNITY EDUCATION

In **2020** we transformed our PNI website providing enhanced navigation and a more patient-focused format. To provide continued community support, doctors presented at virtual support groups or other forums on Facebook Live. Center teams used Zoom to continue providing access to patient and caregiver support groups for Parkinson's disease, pituitary disorders, stroke, and Alzheimer's & dementia.

We launched our wildly popular weekly **Think Neuro podcast** in March which to date has more than 45,000 downloads, and we significantly grew our educational and informative PNI blog offerings. A monthly Brain Matters community education column appears in the Santa Monica Star / Santa Monica Daily Press primarily focused on brain health issues. We also issue a monthly PNI Newsletter.



Think Neuro

Mental Health

★★★★★ 5.0 • 14 Ratings

NOV 18, 2020

9. The Promise of Psychedelics | Dr. Keith Heinzerling & Louie Schwartz...

Addiction and depression are two of the most widespread conditions in all of medicine. After decades of research, doctors are still looking for alternatives for when medication and cognitive training don't work, which is all too often. Dr. Dan Kelly, one of the founders of the Pacific Neuroscience Institute

▶ **PLAY** 56 min

NOV 11, 2020

Think Neuro Mini: Keyhole Brain Surgery with Dr. Daniel F. Kelly

Dr. Daniel F. Kelly, neurosurgeon, director, and founder at Pacific Neuroscience Institute explains the concept of keyhole surgery for the treatment of brain, skull base, and pituitary tumors.

▶ **PLAY** 2 min

NOV 4, 2020

Think Neuro Mini: Meet Dr. Samuel Hou

Samuel Hou, MD, Ph.D., is a neuro-interventional surgeon (interventional neuroradiologist) at the Pacific Stroke and Neurovascular Center, serving the Providence Health System in Southern California. Dr. Hou's surgical techniques specialize in the endovascular treatment of acute ischemic

▶ **PLAY** 2 min

OCT 28, 2020

Think Neuro Mini: Multiple Sclerosis - Disease Modifying Therapies (DM...

Barbara S. Giesser, MD, FAAN, FANA, is an internationally recognized clinician and award-winning educator who has specialized in the care of persons with Multiple Sclerosis since 1982. Her approach to the diagnosis and management of persons with MS combines advanced diagnostics and a

▶ **PLAY** 1 min





"Undoubtedly, the top neurosurgeons in the USA or the world. I can't say enough about the top talent of surgeons, but it's their hearts, caring, concern and humanness that is unparalleled to any other group. If I could give Pacific Neuroscience Institute unlimited stars, I would!"

Patient Review, Facebook

Our pituitary patient support group continued its bi-annual meetings. The movement disorders team consolidated its partnership with American Parkinson's Disease Association (APDA) and were able to finish up a session of the PRESS program with Parkinson's patients. The stroke team had a virtual patient and community event at Little Company of Mary Torrance. Our Multiple Sclerosis specialist was a guest speaker at multiple National Multiple Sclerosis Society events. Our brain health team expanded their support for patients and caregivers introducing HEAD Talks and a women's support group recommending ways to maximize cognitive fitness. In addition, brain health experts have participated

in several community education events and media venues presenting important prevention and care information to our local populations.

2021 will be another year with ongoing focus on patient support and education for those with brain tumors, pituitary tumors, stroke, movement disorders, and neurodegenerative conditions. ENT specialists will begin providing regular educational case study information to patients. The brain health team continues to expand their offerings to patients and caregivers. Through webinars and other online forums, our providers will reach targeted external support groups.



FOUNDATIONS SUPPORT PROGRESS & INNOVATION

2020 saw us continue to build the PNI Foundation infrastructure in partnership with Saint John's Health Center Foundation to support robust PNI growth. We welcomed our new PNI Foundation VP, Melissa Coleman, and our Innovation Director, Dr. Neil Martin, as well as two new advisors to the PNIF board, Michael Ricks, Saint John's Health Center CEO, and Louie Schwartzberg, award-winning director, producer, and cinematographer.

Our commitment to care is achieved through philanthropy and our donor community continued to play an essential role in PNI's ongoing ability to make a difference in diagnosing, treating and preventing disorders of the brain and nervous system.

Will & Cary Singleton's \$40M transformational gift is helping us pioneer new advances to address and cure Alzheimer's disease and other related memory disorders. Many donors have

contributed much needed funding for our research initiatives including innovative brain tumor therapy and device trials, stroke stem cell study, simultaneous cognitive training and physical fitness study, and many more.

We are grateful to our PNIF Board of Directors who include in addition to our four founders: Jae Goodman, Blaine Lourd, Carole Schwartz, Donna Tuttle, Carla Mann Woods, Dr. Neil Martin, as well as Mary Flaherty, Bob Klein, Donna Schweers, Michael Ricks, and Louie Schwartzberg who serve as PNIF Special Advisors, and our PNIF Vice President Melissa Coleman.

2021 heralds strengthened philanthropic partnership between PNI Foundation and Saint John's Health Center Foundation. We continue to focus on development and fundraising to meet our mission and expand the availability of innovative life-altering and life-sustaining treatments for our current and future patients with all types of neurological disorders.



Melissa B. Coleman, Esq., leads PNI Foundation's strategic planning and philanthropic efforts, in partnership with Saint John's Health Center Foundation, to support the growth of the neurosciences at Providence Saint John's Health Center and its affiliates. An accomplished development executive and a lawyer by training, Ms. Coleman joined PNIF after fifteen years of various development and fundraising leadership roles at Cedars-Sinai. She brings extensive experience in campaign strategic planning, design and implementation of capital fundraising campaigns, fundraising operations, data management, reporting and analytics, prospect research, gift administration, donor relations, annual giving and direct response, development communications and the special events teams.



Neil A. Martin, MD, is Director of Innovation and Quality at PNI Foundation, and focuses his efforts on programmatic development at Saint John's Health Center. He is the regional medical director of neuroscience for Providence Southern California and helps oversee and direct neuroscience activities of the 13 Providence hospitals across Los Angeles and Orange counties and in the High Desert. In addition, he serves as the interim Executive Director at Saint John's Cancer Institute. Dr. Martin is considered one of the leading skull base and neurovascular neurosurgeons in the US, having trained countless residents and fellows, overseen numerous clinical trials and NIH grants, and authored almost 300 peer-reviewed publications. From a healthcare administrative perspective, throughout his career, he has focused on neuroscience innovation, quality of care, efficiency and reducing costs.

- For more information about how to support the Pacific Neuroscience Institute, please visit pacificneuro.org/foundation or call **PNI Foundation** at **424-465-1551**.

PNI MEDICAL GROUP

FOUNDERS

CHESTER F. GRIFFITHS, MD

Director, Eye, Ear & Skull Base Center;
ENT Surgeon

DANIEL F. KELLY, MD

Director, PNI, and Director, Brain Tumor Center and
Pituitary Disorders Center; Neurosurgeon

SANTOSH KESARI, MD, PhD

Director, Neuro-oncology, Neuroscience Research Center;
Neuro-oncologist

HOWARD R. KRAUSS, MD

Director, Eye, Ear & Skull Base Center;
Neuro-ophthalmologist

PHYSICIANS

ABBAS A. ANWAR, MD

Otolaryngology - Head & Neck Surgeon,
Eye, Ear & Skull Base Center

GARNI BARKHOUDARIAN, MD

Director, Adult Hydrocephalus Center &
Facial Pain Center; Co-Director Pituitary Disorders Center;
Neurosurgeon

DAVID M. BUTLER, MD

ENT and Plastic & Reconstructive Surgeon,
Eye, Ear & Skull Base Center

WILLIAM G. BUXTON, MD

Director, Neuromuscular & Neurodiagnostic Medicine,
and Fall Prevention, Brain Health Center; Adult
Neurologist

JOSE A. CARRILLO, MD

Neuro-oncologist, Brain Tumor Center

NATALIE DIAZ, MD

Movement Neurologist, Movement Disorders Center

BARBARA S. GIESSER, MD

MS Neurologist, Brain Health Center

SHANTHI GOWRINATHAN, MD

Director, Psycho-oncology, Brain Health Center

JIAN GUAN, MD

Spine Neurosurgeon, Spine Health Center

KEITH HEINZERLING, MD

Director, Treatment & Research In Psychedelics,
Brain Health Center; Addiction Medicine

SAMUEL HOU, MD, PhD

Neuro-interventional Surgeon,
Stroke & Neurovascular Center

ADI IYER, MD, MS

Neurosurgeon, Neuro-interventional Surgeon,
Stroke & Neurovascular Center

SCOTT A. KAISER, MD

Director, Geriatric Cognitive Health, Brain Health Center;
Geriatric Family Medicine

AMIT KOCHHAR, MD

Director, Facial Nerve Disorders Program, ENT, facial nerve,
and Plastic & Reconstructive Surgeon; Eye, Ear & Skull Base
Center

JEAN-PHILIPPE LANGEVIN, MD

Director, Restorative Neurosurgery, Movement Disorders
Center; Director Neuro-Spine Surgery, Spine Institute, PNI-
South Bay; Neurosurgeon

DANIEL W. LEE, MD

Neuro-interventional Surgeon, Stroke & Neurovascular
Center

JEREMY LEVINSON, MD

Ophthalmologist, Eye, Ear & Skull Base Center

NEIL A. MARTIN, MD

Director of Innovation and Quality; Neurosurgeon

OMID B. MEHDIZADEH, MD

Otolaryngologist, and Head & Neck (ENT), and Nasal, Sinus
& Skull Base Surgeon; Eye, Ear & Skull Base Center

DAVID A. MERRILL, MD, PhD

Director, Brain Health Center; Geriatric Psychiatrist

CHIPP K. MILLER, MD

Otolaryngology - Head & Neck Surgeon,
Eye, Ear & Skull Base Center

STELLA PANOS, PhD

Director, Neuropsychology, Brain Health Center; Adult &
Geriatric Neuropsychologist

MELITA PETROSSIAN, MD

Director, Movement Disorders Center; Movement
Neurologist



PNI MEDICAL GROUP / contd.

VERNA R. PORTER, MD

Director, Dementia, Alzheimer's Disease and Neurocognitive Disorders Programs, Brain Health Center; Adult Neurologist

CHRISTOPHER PUTMAN, MD

Neuro-interventional Surgeon, Stroke & Neurovascular Center

AKANKSHA SHARMA, MD

Neuro-oncologist, Brain Tumor Center

WALAVAN SIVAKUMAR, MD

Director, Neurovascular Surgery, PNI; Director, Neurosurgery, PNI-South Bay; Neurosurgeon

JASON TARPLEY, MD, PhD

Director, Stroke & Neurovascular Center; Vascular and Interventional Neurologist

GEORGE TEITELBAUM, MD

Director of Stroke & Neurovascular Center, Neuro-interventional Surgeon

NAVEED WAGLE, MD

Neuro-oncologist, Brain Tumor Center

RESEARCH SCIENTISTS

SARAH C. McEWEN, PhD, NSCA-CPT

Senior Research Scientist, Brain Health Center; Cognitive Psychologist

ELMAR NURMEMMEDOV, PhD, MBA

Director, Drug Discovery, Department of Translational Neurosciences and Neurotherapeutics; Assistant Professor, Saint John's Cancer Institute

ALEXANDRE WOJCINSKI, PhD

Senior Translational Research Scientist, Department of Translational Neurosciences and Neurotherapeutics; Assistant Professor, Saint John's Cancer Institute



Clinic Locations

PNI - SANTA MONICA | 310-582-7640

- 2125 Arizona Ave, Santa Monica, CA 90404
- 1301 20th St, Santa Monica, CA 90404

PNI - WILSHIRE | 310-477-5558

- 11645 Wilshire Blvd, #600, Los Angeles, CA 90025

PNI - SOUTH BAY | 424-212-5361

- 5215 Torrance Blvd, #300, Torrance, CA 90503
- 4201 Torrance Blvd, #520, Torrance, CA 90503