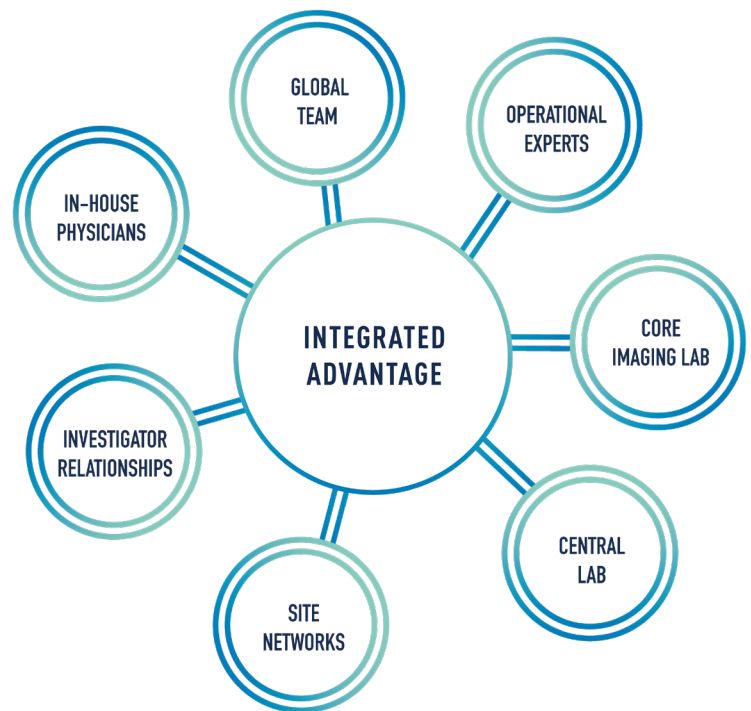


A DEEPER DIVE INTO SUBSTANCE ABUSE DISORDERS

AN INTEGRATED ADVANTAGE

As a full-service and therapeutically-focused CRO, Medpace specializes in the design and conduct of global trials in substance use disorders clinical research, including psychiatry. We bring a global footprint, strategic medical, regulatory, and operational leadership as well as fully integrated Central Labs and Core Imaging services to accelerate substance use disorder studies.

- Highly relevant operational know-how and subject matter expertise in managing and executing substance use disorder studies
- A well-profiled network of investigative sites enables timely enrollment and high-quality conduct of trials
- End-to-end suite of global imaging services seamlessly integrated into the overall structure of the trial
- A wide range of relevant biomarker assays through our wholly-owned central and bioanalytical lab network



THERAPEUTICALLY-FOCUSED TEAM

Medpace is unique in its scientifically-driven approach to clinical research. Our model gives Sponsors the advantage of early and ongoing insight and guidance from a team of therapeutic experts throughout the trial design and execution. Our highly experienced team of medical, regulatory, and operational experts work collaboratively to conduct clinical trials. We understand issues from the perspectives of Sponsors, clinical investigators, scientific leaders, and reviewers at regulatory agencies. With this insight, we successfully define and execute clear development plans from beginning to end.



SCIENTIFIC-DRIVEN DEVELOPMENT

Serving as therapeutic team leaders, our in-house medical doctors apply years of psychiatric/neurologic drug development experience to each study. Our medical leaders provide strategic direction for study design and planning, train operational staff, work with Investigators, provide medical monitoring, and meet with regulatory agencies as well as our global regulatory affairs experts to provide strategic guidance into the best pathways to accelerate approvals. Medpace MDs are embedded throughout every study, providing greater depth of expertise and the ability to tackle complex and challenging diseases.

In-House Physicians



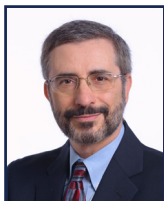
Sarah DeRossett, MD, PhD
Senior Medical Director,
Medical Department



Toshihiro Hokonohara, MD
Medical Director,
Medical Department



Filipe Brogueira Rodrigues, MD, MSc
Medical Director,
Medical Department



Richard D. Scheyer, MD
Vice President,
Medical Department



James Vornov, MD, PhD
Vice President,
Medical Department

ADVANCED CLINICAL PRACTITIONERS ADD A PATIENT'S PERSPECTIVE

Our medical directors are supported by experienced ACPs whose unique perspective brings added value to the clinical development team. These highly-trained experts with advanced degrees and hands-on clinical experience provide an additional layer of knowledge and insights that can streamline your studies and address potential challenges early in the study planning. ACPs are embedded in the teams to ensure your study is feasible and operationalized for efficient execution by looking at the protocol through the lens of the patient and site staff. ACPs also help with the review of safety events, ongoing team education, recruitment strategies, and study document review. Their understanding of what works in a clinical setting makes them a valuable part of our embedded medical expertise model.

In-House Practitioners



Danielle Mattingly, FNP-BC, MPH
Advanced Clinical
Practitioner



Sarah DeRossett, MD, PhD

*Senior Medical Director, Medical Department,
Neurology, Psychopharmacology, Analgesia*

Dr. Sarah DeRossett is a board-certified neurologist with 15 years of experience in clinical and academic neurology, plus more than 10 years of drug development experience.

Experience Summary

- Drug development expertise in neuropsychiatric disorders, dementia, opioid use disorder, sleep, and other CNS disorders
- Clinical and drug development experience in pain and analgesia
- Extensive research experience in psychopharmacology with special focus on opioids
- Leadership of clinical development programs in Parkinson's disease, Alzheimer's disease, Migraine, Restless Leg Syndrome (RLS), Neuropathic pain, Epilepsy, and Opioid Use Disorder
- Broad experience in pharmaceutical R&D, including single point of accountability for clinical development plans, medical governance, and support of regulatory submissions
- Well-published in the peer-reviewed medical and scientific literature

Education Summary

- Doctor of Medicine, cum laude, Emory University School of Medicine
- Postdoctoral Fellowship, Pharmacology, Emory University School of Medicine
- Residency in Neurology, The Johns Hopkins Hospital

Toshihiro Hokonohara, MD

*Medical Director, Medical Department,
Neurology, Psychiatry*

Dr. Toshihiro Hokonohara is a board-certified neurologist with over 15 years of clinical practice and academic neurology including experience in leadership roles at pharmaceutical and global contract research organizations.

Experience Summary

- Drug development expertise in neuropsychiatric disorders, dementia, autoimmune disease, oncology and other CNS and Internal Medicine disease
- Clinical and drug development experience in neuro-immunological disease
- Extensive research experience in some neurological hereditary disease
- Pharmacovigilance Leader of clinical development programs in Epilepsy
- Broad experience in pharmacovigilance medical governance and support of regulatory submissions

Education Summary

- Doctor of Medicine, Kyushu University – Fukuoka, Japan
- Residency in Neurology, Kyushu University Hospital – Fukuoka, Japan



Filipe Brogueira Rodrigues, MD, MSc

Medical Director, Medical Department

Dr. Filipe Rodrigues is an academic neurologist with over 6 years of drug development experience in neurology and psychiatry.

Experience Summary

- Served as academic neurologist at University College London Queen Square Institute of Neurology and as clinician at the National Hospital for Neurology & Neurosurgery in London
- Hands-on clinical trial experience in neurodegeneration, movement disorders and neurogenetics, including antisense technology and intrathecal delivery
- Member of working groups for Movement Disorders Society, Research Ethic Committee, Critical Path Institute, and Cochrane Collaboration
- Academic research in biofluid biomarkers and clinical pharmacology
- 50+ peer-reviewed medical and scientific publications

Education Summary

- Master's Degree in Medicine, Faculty of Medicine, University of Lisbon – Lisbon, Portugal
- Bachelor of Science Degree in Medicine, Faculty of Medicine, University of Lisbon – Lisbon, Portugal

Richard D. Scheyer, MD

*Vice President, Medical Department,
Neurology, Pharmacology*

Dr. Richard Scheyer is a board-certified neurologist with over 30 years of professional medical experience which includes 18 years dedicated to clinical drug development.

Experience Summary

- Pioneer in translational medicine and Phase I/IIa drug development with special interest in early demonstration of clinical efficacy
- Led a team that designed and executed an early development program for next-generation alpha-2 delta ligand, including capsaicin challenge, and crafting Proof of Concept strategy for novel ion channel blockers
- Highly-regarded author with over 60 manuscripts and abstracts, with a focus on clinical pharmacology and therapeutic activity in areas ranging from diabetes to oncology
- Launched first controlled trial natural product-derived protein kinase C activator in Alzheimer's at previous company

Education Summary

- Bachelor of Science, Physics, Stanford University
- Doctor of Medicine, The State University of New York, Upstate Medical University
- Residency in Neurology, Yale University
- Fellowship Training in Epilepsy, Yale University



James Vornov, MD, PhD

*Vice President, Medical Department,
Neurology, Analgesia, Psychiatry*

Dr. James Vornov is a board-certified neurologist with over 18 years of director level clinical development experience.

Experience Summary

- Brought multiple compounds into first-in-man to proof-of-concept and successful NDA submission. Provided broad clinical trial design expertise, clinical pharmacology experience, operational excellence and global regulatory strategy development across a broad range of CNS diagnostics and therapeutics
- Expertise in the rapid transition of compounds from the laboratory to clinical proof of concept using Critical Path technologies such as biomarkers, PK/PD modeling and clinical trial simulation
- Worked in multiple CNS therapeutic areas having directed programs in Depression, Suicidal Ideation, Parkinson's disease treatment and diagnosis, stroke, neuropathic pain, diabetic and chemotherapy-induced peripheral neuropathies, anesthesia and brain tumors

Education Summary

- Bachelor of Arts, Biology & Psychology, Columbia University
- Doctor of Medicine, Emory University, School of Medicine
- Doctor of Philosophy, Anatomy, Emory University, School of Medicine

Danielle Mattingly, FNP-BC, MPH

Advanced Clinical Practitioner

Ms. Mattingly is a certified Family Nurse Practitioner and Neuroscience Registered Nurse. She brings experience in clinical research, public health, and health policy.

Experience Summary

- Extensive experience as a Neurology Nurse Practitioner at multiple university medical centers
- Experience providing both inpatient and outpatient care of patients, including patients with epilepsy and sleep disorders
- Served as sub-investigator on active clinical trials for novel treatments of localization related epilepsy, narcolepsy, and idiopathic hypersomnia
- Actively worked to create an education lecture series for neurology advanced practice providers
- Active member of multiple neurology and advanced practice nursing associations

Education Summary

- Master of Science in Nursing, Family Nurse Practitioner, Columbia University – New York, NY
- Master of Public Health in Health Policy and Management, Columbia University – New York, NY
- Bachelor in Nursing Science, Columbia University – New York, NY
- Bachelor of Arts in Public Health, Vanderbilt University – Nashville, TN



EXPERIENCE

Medpace has an in-house psychiatrist, neurologists, imaging specialists, and operational teams with relevant and recent experience in managing and executing substance use disorder studies. In addition, we have experience overcoming the challenges associated with regulations regarding controlled scheduled drugs –including getting sites up and running from a regulatory perspective.

Our physicians and staff are experienced in the following areas:

- Opioid/narcotics
- Methamphetamines/cocaine
- Alcohol
- Nicotine

RECRUITMENT AND SITE RELATIONSHIPS

Recruiting patients for substance use disorders can be challenging because patients need to be willing to get help for their addiction. Retaining patients is also difficult because high-dropout rates are associated with this patient population. Medpace is able to navigate the complex world of patient recruitment and retention by employing our multi-dimensional recruitment model that enables us to implement customized strategies that identify, recruit, and retain members of specific patient populations.

With broad neuroscience experience and relationships with Investigators and Key Opinion Leaders (KOLs) worldwide, we can select the best sites for your specific program. We provide in-depth knowledge of screening tools and rating scales and will provide oversight for rater services including subjective assessments, inter-rater reliability, and scale validation.

SAFETY AND BIOMARKER ANALYSIS

Medpace Labs provide consistency in methods and instrumentation across wholly-owned and purpose built laboratories located in the US, Europe, China and Singapore. Medpace's frontline testing for drugs of abuse is immunoassay based screening tests that identify drugs of abuse by class. The central lab performs 14 common drugs of abuse screening tests on the Beckman Coulter chemistry analyzer. If there are requirements (e.g. determination of specific metabolite, possible cross-reactivity) they are followed by confirmatory testing (typically GC/MS or LC/MS) which Medpace offers through our partner lab network.

Medpace Bioanalytical Laboratories has significant experience with small molecules, biologics, and biomarkers across a wide variety of technologies and therapeutic areas including substance use disorders. We also have the capability to work with Sponsors to create new assays and biomarkers to investigate novel endpoints.

Below are key biomarkers used in drugs of abuse.

TYPE	BIOMARKER	MEDPACE VALIDATED ASSAYS	MEDPACE LAB PARTNER NETWORK
DRUGS OF ABUSE	6-ACETYLMORPHINE		✓
	AMPHETAMINE AND METHAMPHETAMINE	✓	
	BARBITURATES	✓	
	BENZODIAZEPINE	✓	
	BUPRENORPHONE	✓	
	COCAINE	✓	
	COTININE		✓
	ECSTASY (MDMA)	✓	
	EDDP		✓
	ETHANOL	✓	
	FENTANYL		✓
	HYDROCODONE		✓
	HYDROMORPHONE		✓
	KETAMINE		✓
	LSD		✓
	METHADONE		✓
	METHAQUALONE	✓	
	OPIATES	✓	
	OXYCODONE	✓	
	PCP	✓	
	PROPOXYPHENE		✓
	TCA	✓	
	THC	✓	
	TRAMADOL		✓
CONFIRMATION TESTS			✓



EXECUTION

CORE IMAGING LAB

Neuroimaging plays a crucial role in determining how substance use disorders affect changes in brain structure, function, and neurochemistry. Medpace Imaging Core Lab has experience in the primary imaging techniques that are used to reveal different structures of the brain.

The primary techniques are:

- Structural Magnetic Resonance Imaging (MRI)
- Functional MRI
- Magnetic Resonance Spectroscopy (MRS)
- Positron Emission Tomography
- Single Photon Emission Computed Tomography (SPECT)

CARDIOVASCULAR CORE LAB

The potential cardiac side effects of drugs in development and the long-term cardiovascular effects of substance abuse are quantified in the identification of the cardiovascular status of the patient at baseline right through the treatment phases of the clinical development program. State of the art surface ECG and Holter monitoring for potential arrhythmia assessment as well as changes in blood pressure through the use of centralized ambulatory blood pressure monitoring are utilized by the Medpace Cardiovascular Core Laboratory team consisting of board certified cardiologists and highly trained and experienced electrocardiographic analysts, biostatisticians, pharmacometricians, data managers and medical writers.

FULL-SERVICE CLINICAL DEVELOPMENT

Medpace is a scientifically-driven, global, full-service clinical contract research organization (CRO) providing Phase I-IV clinical development services to the biotechnology, pharmaceutical and medical device industries. Medpace's mission is to accelerate the global development of safe and effective medical therapeutics through its high-science and disciplined operating approach that leverages local regulatory and deep therapeutic expertise across all major areas including oncology, cardiology, metabolic disease, endocrinology, central nervous system and anti-viral and anti-infective.

