As I reflect back on 2021, and the unique challenges and suffering caused by the COVID-19 pandemic, climate-related crises, and the deep health disparities these have revealed, I remain committed to our center's vision and mission—which at its core, emphasizes the role of 'integration' and interconnectedness at all levels of health. As is highlighted in our updated 2021 Five-year Strategic Plan:

We are committed to advancing a model of health that recognizes the interconnections of the body, mind and spirit to enhance resilience and promote health and healing in individuals and communities.

Strong scientific evidence supports interconnected and interdependence for all dimensions of health, and why the whole is more than the sum of its parts. Mind-body research has shown that what and how we think and feel—the levels of stress or happiness, social connection or isolation that we experience—deeply impact every aspect of our physiology, including the health of our heart and brain, our ability to cope with pain, and even how long we live. Conversely, even modest changes in lifestyle, exercise, diet, exposure to nature and practices that enhance mindfulness, not only impact health and our reliance on medication, but also impact how we interact with others, and the demands we make on the healthcare system and our environment.

It’s all connected!

Leveraging our ‘center without walls’, we continue to bring members of our community together to work synergistically towards our shared goals of healthy individuals and communities. In this 2021 Annual Report, we highlight how our Grand Rounds and other educational initiatives have convened experts across Integrative Medicine and Health to share insights, spark synergy, and train the next generation of health care providers, researchers, and leaders. We provide an update on how our pilot research grants program, which to date has disbursed more than 1.1 million dollars, continues to seed new collaborations, ranging from studies evaluating the impact of stress reduction on inflammation and atherosclerosis to novel brain health programs to prevent age-related cognitive decline. In combination with the collaborative studies being led by our research directors, we are proud to share how our research is generating evidence to inform clinical care and new models of healing that target the whole person, body, mind and spirit.

As always, my team and I remain immensely grateful to the Osher Foundation as well as other foundations and philanthropic partners for their vision and generous support, and their trust in us to make a difference in the health of today’s and future generations.

With best wishes,

Peter M. Wayne, Ph.D.
Bernard Osher Associate Professor of Medicine in the Field of Complementary and Integrative Medical Therapies
Harvard Medical School
Director
Osher Center for Integrative Medicine
Brigham and Women’s Hospital and Harvard Medical School
One significant accomplishment in 2021 was the completion of a new Five-year Strategic Plan. Through a series of coordinated retreats and focus groups, the Osher Center leadership team, in collaboration with its advisory teams and stakeholders across Brigham and Women’s Hospital (BWH), Harvard Medical School (HMS) and collaborating institutions, renewed the vision and mission of the Osher Center, and created a roadmap to guide the center over the next five years. The plan is designed as a “living document” and is expected to grow and evolve as the Center moves forward, and as it adapts to meet new challenges and opportunities in medicine and healthcare. An executive summary of this plan is accessible on the Osher Center website: www.oshercenter.org.

**Mission**

The mission of the Osher Center for Integrative Medicine is to advance leading-edge research, education and clinical care to promote an integrative model of health, healing and well-being.

**Vision**

The Osher Center for Integrative Medicine envisions a systems-based, integrative model of health that recognizes and leverages interconnections of body, mind, and spirit to enhance resilience and promote health, healing and well-being in individuals and their communities.

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### Integrating medicine, health and healthcare at the Osher Center

Advances in molecular biology and translational research have led to remarkable progress in medicine — especially in our understanding of pathogenesis and the diagnosis and treatment of diseases. However, less progress has been made in understanding how individuals transition from a state of disease back to health. Fundamentally, health is more than the simple absence of disease. The siloed nature of medicine today, organized around medical specialties (e.g., cardiology, neurology), has hindered our ability to ‘see’ and treat the whole person. Integrative approaches appreciate the complex multi-system dynamics that underlie health and disease — including body, mind and spirit — in both prevention and rehabilitation. It values and integrates the technological successes of disease curing along with the patient-centered exploration of healing.

At the Osher Center, we strive to integrate medicine, health and healthcare on many levels. We recognize, seek to understand, and embrace the complexity inherent within and across all levels of health, healing, and well-being, from molecular and physiological systems to individuals and communities. Through rigorous and innovative research, we strive to be thought leaders bridging a variety of healthcare professions and paradigms. Our educational programs advance this knowledge through the training of the next generation of researchers, healthcare professionals, and leaders in the field of integrative medicine. Our Osher Clinical Center aims to provide the highest quality, transdisciplinary patient-centered care through a health equity lens. Our Integrative Medicine Network Forums, Grand Rounds and conferences convene scientists, practitioners and the public together to exchange ideas, advance research and best practices, and inform policy.
Migraine headaches affect approximately 15% of the US population and are among the top five causes of lifetime disability. Although medications are often used as first-line treatments for migraine, these treatments may have intolerable side effects and are not effective for all patients. Over 75% of migraine patients report neck pain and muscle tension, suggesting that treatments that target musculoskeletal complaints may be effective in managing migraine.

A study led by Drs. Pamela Rist (Osher Core Leader of Clinical Trials, Epidemiology and Biostatistics) and Peter Wayne (Center Director), along with Osher Clinical Center (OCC) providers, Drs. Kowalski and Bernstein, evaluated the benefits of a multimodal chiropractic intervention in combination with migraine education, compared to migraine education alone. Both groups also received usual medical care. The study found that, compared with the control group, 10 sessions of chiropractic care delivered over 14 weeks led to greater reductions in migraine days along with decreases in self-reported migraine disability. The study was published in the journal Cephalalgia.1

A parallel qualitative study led by research intern Julie Connors, highlighted patients’ appreciation for the integrative and team-based approach to migraine care offered through the Osher Clinical Center, which included patient encounters with both a chiropractors and neurologist.2 The research was funded by generous grants from the NCMIC Foundation, the Inter-Institutional Network for Chiropractic Research through Palmer College Foundation, and the Crimson Lion Foundation.

The team has submitted an NIH grant in partnership with colleagues from VA Connecticut Health Care System and Yale University that aims to confirm and expand these findings to a larger sample including men and women veterans.

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Migraine headaches are among the top five causes of lifetime disability

As the largest OLP clinical trial to date and the first to directly compare the effects of OLP and double-blind placebo, this landmark study significantly advances our understanding of the therapeutic encounter and contextual effects in medicine.

Since Henry Beecher’s landmark article in 1955, “The Powerful Placebo,” the conventional belief is that patients must be blinded to treatment assignment and placebos concealed in order for them to be effective. In earlier work, members of the Osher Center reported in a pilot study the positive effects of non-concealed, “open-label” placebo (OLP) as treatment for irritable bowel syndrome (IBS) that challenged this widely-held assumption.

Most recently, the team including Osher’s Director of Basic and Translational Research, Dr. Kathryn Hall, conducted an innovative and provocative NIH-funded extension of the earlier research. Patients with moderately-severe stable IBS (N=262) were randomized to receive OLP pill, no pill placebo, or double-blind placebo.3 At the end of six weeks, IBS symptom severity was significantly improved in those who received OLP compared to no pill placebo, and similar to those who received double-blind placebo. The study suggested that OLP could play a role in the management of symptoms in patients with IBS and that blinding may not be necessary for placebos to be effective.

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Mind-body practices to enhance long-term physical activity and self-efficacy in patients with chronic cardiopulmonary disease

Physical activity and exercise have long been a part of guideline recommendations for chronic cardiopulmonary conditions such as Chronic Obstructive Pulmonary Disease (COPD). Unfortunately, implementation and maintenance of exercise in these populations is a great challenge. Two companion studies led by Dr. Gloria Yeh (Director of Clinical Research), together with Peter Wayne (Center Director), have examined how mind-body movement therapies can be utilized to support self-efficacy, physical activity, and positive behavior change in patients with cardiopulmonary disease.

One study in patients with COPD provides preliminary support for tai chi and improved quality of life, emotional health, fatigue, and dyspnea after 12 weeks. Continuing tai chi beyond 12 weeks may further affect self-efficacy, exercise capacity, and lower body strength. In qualitative narratives, patients reported increases in overall body awareness, self-care knowledge/skills, behavior-related neurocognitive processes, physical function, and psychological wellbeing. In another COPD study, tai chi was examined as an exercise maintenance strategy after patients engaged in conventional pulmonary rehabilitation. More individuals who participated in tai chi improved their exercise capacity compared to controls. In qualitative interviews, patients described how tai chi promoted physical and mental wellbeing by diminishing fear and embarrassment associated with breathlessness, facilitating continued physical activity and thus improvement in quality of life.

These findings highlight the interdependence of mind and body in a holistic, biopsychosocial manner and the promise of mind-body exercise for long-term behavior change. Collectively, these studies have led to several NIH grant submissions to further study integrated mind-body movement approaches to improve outcomes in cardiopulmonary populations.
**Training the Next Generation in Integrative Medicine Research and Leadership**

Our NIH-funded post-doctoral research fellowship continues to thrive. It is the longest standing training program in integrative medicine research in the United States. Our four current fellows-in-training are tackling leading edge research topics ranging from brain responses to meditation in patients with chronic pain to the scientific basis for acupuncture points. Their work has led to multiple peer reviewed publications and awards. Recent graduates have joined Harvard faculty, and earlier graduates of the Fellowship continue to have an important presence in integrative medicine leadership roles nationally. In addition, in 2021, we secured funding from NCMIC Foundation to support training for our first chiropractic fellowship.

Meet our current research fellows:

**RESEARCH FELLOWS**

- **WREN BURTON, DC,** is one of our newest fellows supported by a generous gift from the NCMIC Foundation. Dr. Burton’s research focuses on the relationship between vision and musculoskeletal pain, mobility and fall risk, and the potential use of chiropractic care for fall prevention.

- **MICHAEL DATKO, PhD,** is a 2nd year T32 Fellow. His work examines the neurophysiology of multi-modal therapies including vagal nerve stimulation and mindfulness meditation for chronic pain.

- **JACKLYN FOLEY, PhD,** is a 2nd year T32 Fellow. Her research evaluates mindfulness and cardiovascular health among people living with HIV. Her work is supported by a Harvard University Center for AIDS Research (CFAR) Developmental Award. She was also awarded an Innovative Early Career Pilot Award in Aging and Palliative Care at the Massachusetts General Hospital to study cognitive behavioral therapy based group interventions to reduce inflammation in older people with HIV.

- **EUNHIEE YANG, PhD, MPH, MS, LICAC,** is a 3rd year T32 Fellow. Her research focuses on understanding the biophysical properties of acupuncture points, using sophisticated measures of blood flow, skin temperature and pressure sensitivity, within the context of inflammatory bowel disease.

- **VAN MA, PhD,** graduated from the fellowship in 2021 and is now a junior faculty member at the Osher Center. Her research explores the use of non-linear physiological markers of heart and brain wave dynamics to characterize sleep quality, and how bedtime mind-body practices can improve sleep onset and quality in patients with insomnia.

- **DENNIS MUNOZ-VERGARA, VMD, PhD, MPH,** graduated from the fellowship in 2021. He studies the impact of yoga-like stretching forces on tissue remodeling, inflammation and resolution.

- **KRISTEN KRAEMER, PhD,** graduated from the T32 program in 2020. She was awarded the Osher Fellowship in Cognitive Behavioral Therapy. Her research focuses on understanding the efficacy of cognitive behavioral therapy and mindfulness meditation for physical activity engagement in metabolic syndrome.

- **EARLY T32 GRADUATES ASSUMING NEW NATIONAL LEADERSHIP ROLES IN 2021**

- **KRISTEN KRAEMER, PhD,** is a 3rd year T32 Fellow. Her research evaluates mindfulness and cardiovascular health among people living with HIV. Her work is supported by a Harvard University Center for AIDS Research (CFAR) Developmental Award. She was also awarded an Innovative Early Career Pilot Award in Aging and Palliative Care at the Massachusetts General Hospital to study cognitive behavioral therapy based group interventions to reduce inflammation in older people with HIV.

- **EDUCATION**

  Education remains one of the three pillars of our Center’s mission. In addition to providing education through our Grand Rounds, Network Forums, and scientific and public presentations delivered by our leadership, we are also committed to training the next generation of clinicians and researchers in integrative medicine. In 2021, we continued our successful National Institutes of Health (NIH)-funded HMS Research Fellowship in Integrative Medicine (T32) into its 22nd consecutive year and initiated novel programs to train healthcare providers and researchers with life-long resiliency skills.

- **BUILDING LIFELONG RESILIENCY SKILLS FOR HEALTHCARE PROVIDERS AND RESEARCHERS**

  Mounting evidence points to the tremendous levels of stress experienced by healthcare providers and researchers. The COVID-19 pandemic and underlying systemic inequities continue to exacerbate stress levels. Without the provision of tools to mitigate and mediate these impacts, providers and researchers will continue to experience high levels of anxiety, suicide and burnout.

  In 2021, the Osher Center continued to build on and develop new programs to care for medical trainees and professionals. This included (1) adapting and continuing the HMS required course in resilience, (2) developing a new program for students graduating from the Science Technology Engineering and Mathematics (STEM) program, and (3) leading virtual meditation sessions for the hospital community across Mass General Brigham and (3) establishing TedxMGH.

**Harvard Medical School Resiliency Course (BRDG)**

The Building Resiliency, Depth and Grit in Medicine program (BRDG) is a required resiliency training course for all first-year students at Harvard Medical School. Developed in 2019 by Dr. Darshan Mehta, Osher Center’s Education Director, the course continues to be taken by all 180 first year medical students each year.

**Virtual Meditations for Hospital Community**

With the onset of the pandemic, Dr. Darshan Mehta was asked to lead virtual meditation sessions. In 2021, these sessions became a regular offering for the MGB community—a direct result of many domains of well-being, being leveraged to seek funding for a national demonstration project in 2022.

**TEDxMGH**

In 2021, Dr. Darshan Mehta built out a new Tedx speaker series, showcasing inspirational stories from the Mass General community, including how people have handled challenges through innovation, resilience, vulnerability, and connection.
We are proud to share some of the notable achievements of the Osher Clinical Center (OCC) in 2021. These include professional and public recognition of our providers, considerable financial growth, despite the COVID-19 pandemic, and expanded and new clinical programming. New grant funding allowed the clinic to establish resiliency programs for Mass General Brigham (MGB) employees and their families and new resiliency-based public classes were also made available for the public. We optimized provider schedules in order to see more patients and took steps to recruit new providers to expand our team. Finally, as a pillar of our current financial model, the clinic continued to provide co-locating space to other MGB departments and services, such as neurology and pulmonary. The above combination of novel program-co-locating space to other MGB departments and services, such as a pillar of our current financial model, the clinic continued to provide and took steps to recruit new providers to expand our team. Finally, as a pillar of our current financial model, the clinic continued to provide co-locating space to other MGB departments and services, such as neurology and pulmonary. The above combination of novel program—co-locating space to other MGB departments and services, such as neurology and pulmonary. The above combination of novel program—co-locating space to other MGB departments and services, such as neurology and pulmonary. The above combination of novel program—co-locating space to other MGB departments and services, such as neurology and pulmonary. The above combination of novel program—co-locating space to other MGB departments and services, such as neurology and pulmonary. The above combination of novel program—co-locating space to other MGB departments and services, such as neurology and pulmonary.
NETWORK BUILDING

Strengthening and Stewarding the IM Community through Our Center Without Walls

As a “Center Without Walls,” one of our primary aims is to connect and strengthen the integrative medicine community across Harvard Medical School—and beyond. We did this in a myriad of ways throughout 2021 despite the limitations on in-person gathering that the COVID-19 pandemic presented. We continued to support innovative research through our signature Osher Pilot Research Grants and provide opportunities for learning and connection through our monthly Grand Rounds, co-sponsored events, and online presence.

Pilot Research Grants

Since the Osher Pilot Research Grant program was launched in 2015, we have distributed over $1 million in seed funding to the HMS community. The program supports innovative, cross-disciplinary and collaborative projects in integrative medicine that are consistent with the research domains within our Strategic Plan:

• The Science of Mind-Body Connections;
• Clinical Effectiveness of Multimodal and Integrative Interventions;
• Systems and Translational Biology in Integrative Medicine; and
• Placebo and the Science of Human Connections.

We provide discretionary and competitive awards. To date, over 50% of funds have supported competitive grant applicants. All projects are scored against strategic and scientific merit, with competitive applications undergoing an additional formal peer-review process.

Each year we award $100,000 in competitive grants, generally across three projects. Studies are followed for up to three years post-award to determine outcomes beyond the initial research results, such as leveraged new research funds, publications, scientific presentations and new collaborations.

Notable outcomes from past Pilot Project Awards

Olivia Okereke, MD (2017: BWH)
Relation of DNA methylation and molecular markers to health and well-being in aging
Publication: Transl. Psychiatry, 2019
Poster: Alzheimer’s Association International Conference, July 2019 LA, CA, USA.
R01 Grant Award (NIH/NIMH): Neuropsychiatric Symptoms, Cognitive Aging and DNA Methylation Age in the VITAL-DEP cohort. Total award $341,815 (2018)
New collaboration: Former Osher Pilot Award recipient, Dr. Eric Bui Bui as PI and Okereke as Co-PI for NIH R34 grant submission April, 2018.

Michelle Dossett, MD, PhD, MPH (2018: MGH)
A SMART approach to reducing atrial fibrillation symptoms
Publication: Heart Rhythm O2, Clinical Atrial Fibrillation, 2021
R01 Grant Submitted: (NIH, June 2021) for a multi-site trial
New collaborations: at University of California, Davis (UCD)
New pilot-funded: (UCD Academic Senate) study of the SMART program in patients following an acute myocardial infarction with some sophisticated imaging technology.

Ahmed Tawakol, MD (2019: MGH)
Impact of stress reduction on inflammation and atherosclerosis
K23 Grant Award: Critical feasibility data from Osher pilot secured funding for companion study.
Publications: Five resulting scientific papers published in 2021
Abstracts: Seven resulting research abstracts published in 2021.

2021 Awards

Competitive awards

Ana-Maria Vranceanu, PhD
Dept. Psychiatry, MGH
My healthy brain: a novel mind-body program for promoting brain health through lifestyle change

Huan Yang, PhD
Dept. Neurology, BIDMC
Examining the interactive effects of mindfulness and slow-paced breathing on stress physiology

Discretionary awards

Kathryn Hall, PhD
Dept. Medicine, BWH
The impact of polysupplementation in functional assays, cardiovascular disease, hospitalization and all-cause mortality

Peter Wayne, PhD
Dept. Medicine, BWH
Biophysical assessments of acupoints in inflammatory bowel disease: a pilot study
Inaugural Jack Cogan Integrative Medicine Lecture
In October 2021, we hosted the first installment of a newly endowed annual lecture series to honor the life of Mr. Jack Cogan and his active engagement with and support of integrative medicine at the Osher Center. Mr. Cogan was committed to physical activity and good health, and we thank his wife, Mary Corneille, for her generous gift to support the series to showcase the benefits of integrative care during COVID-19.

“Jack always understood the importance of exercise, and his lifelong passion for running started on a cross country team in high school. When health challenges began making it more difficult for him to continue his running routine and medications were not able to compensate, he began looking at how integrative therapies offered by the Osher Center might help him. Therapeutic massage and tai chi both contributed to Jack’s balance, patience and better understanding of how to deal with the limitations of his neurological disease.”

Mary Corneille

Integrative Medicine Grand Rounds
Our monthly Integrative Medicine Grand Rounds have been running since 2015 and have inspired other integrative medicine centers to create similar programs. Attendance remains double that of prior years since switching to a fully virtual format in 2020 in response to the pandemic. In 2021, we hosted successive leaders from their respective fields including Joseph Loscalzo, JoAnn Manson, Jun Mao and I-Min Lee. Research and clinical case presentations included a diverse range of topics from diet and nutrition, cardiovascular health, healthy aging, integrative oncology and delivering integrative care during COVID-19.

2021 Grand Rounds
Registered: 1,800
Attended Live: 1,100
YouTube Views: 3,130

Cross-institutional collaborations
Harvard Medical School Distinguished Lecture in Mind Body Research and Health: In June of last year, the Osher Center partnered with the Benson-Henry Institute for Mind Body Medicine (BHI) and the Center for Mindfulness and Compassion (CMC) at the Cambridge Health Alliance (CHA) to launch this rotating annual lecture series to showcase excellence and innovation in mind body research and health. Willem Kuyken, PhD, DClinPsy presented the inaugural lecture on entitled, “Mindfulness-Based Cognitive Therapy for Life: Ancient Wisdom Meets Modern Psychology in the Contemporary World.”

Online presence
We reach our online integrative medicine community through our Osher Center.org website, monthly e-newsletter, YouTube Channel, and social media postings. We support the connectivity of our community with video resources, research publications, access to clinical providers and news and event updates.

Symposia development
To maintain programming momentum, Osher faculty started planning our fifth biennial Integrative Medicine Forum, to be held virtually on November 19 & 20, 2022, entitled “The Lived Experience of Depression—And Integrative Approach” and our inaugural International Tai Chi Research Conference, “The Science of Tai Chi & Qigong as Whole-Person Health,” to be held in-person in the fall of 2023.
In 2021, Osher faculty continued to provide visionary leadership to the integrative medicine community through local, national and international presentations and contributions. Faculty remained active in a variety of committees and organizations responsible for steering and shaping the future of integrative medicine globally. In addition, the Translational Research Director assumed new responsibilities in Boston and the Osher Center created a new leadership position to direct initiatives in planetary health.

### Faculty Invited Presentations

Faculty gave 58 invited presentations, ranging from local talks to international keynotes. The full list of presentations can be found in Appendices 4-7. Some noteworthy presentations include the following:

- **Peter Wayne**
  - Tai Chi for Whole Person Health and Healthy Mind-body Aging (Virtual)
  - Osher Collaborative Clinical Speaker Series
  - Stress, Anxiety and Burnout.
  - Jaseng Medical Academy, Seoul, South Korea

- **Darshan Mehta**
  - Tai Chi for Fall Prevention: Research (Virtual)
  - Invited Symposium Presenter: The Science of Interoception; Society for Acupuncture and Integrative Medicine (ACIMH)

- **Gloria Yeh**
  - Laying the Foundation: Defining Building Blocks of Music-Based Interventions
  - Panacea or Poison: Placebos and Nocebo Effects in Clinical Care
  - Medical Mechanisms of Placebo Response: From Genes to Pathways

- **Matthew Kowalski**
  - A Series of Interesting Cases at the Osher Clinical Center
  - Bridging Clinical Practice into Chiropractic Research: Integrative Migraine Pain Aversion through Chiropractic Therapy (IMPACT) Trial

- **Kathryn Hall**
  - Health Disparities and Nocebo Effects in Clinical Care
  - Physician Wellness & Health: An Integrated Approach
  - Panelist, Inter-Institutional Chiropractic Research Network

- **Matthew Kowalski**
  - Chair, Diversity, Equity and Inclusion (DEI) Task Force for the Academic Consortium for Integrative Medicine and Health (ACIMH)

- **Kathryn T. Hall, PhD**
  - Director of Basic and Translational Research was selected to serve as Deputy Executive Director, Population Health and Health Equity, at the Boston Public Health Commission. Her new role includes overseeing the Offices of Research and Evaluation, Racial Equity and Community Engagement, The Community Health Education Center, The Consortium for Professional Development, and The Child and Family Health Bureau. Dr. Hall continues to maintain strong links with the Osher Center.

### Faculty National and International Leadership Positions

- **Peter Wayne**
  - Membership on multiple NIH grant review panels (NIA and NCCIH)

- **Kathryn Hall**
  - Chair, Data and Safety Monitoring Board for the NIH-funded multicenter trial: Spinal Manipulation and Patient Self-Management for Preventing Acute to Chronic Back Pain (PASCAP)

- **Matthew Kowalski**
  - Member, Advisory Board, Assessing Pain, Patient Reported Outcomes and Complementary Health (APPROACH): The C-IH For Pain National Demonstration Project, Veterans Administration

- **Kathryn Hall**
  - Fellow and Faculty Member, Mind & Life Research Institute

### New Leadership Transitions

- **Kathryn T. Hall, PhD**
  - Director of Basic and Translational Research

- **Atelah Z. Nusrat, MSc, DIC**
  - Former Program Manager, was re-appointed as Senior Program Manager and Director of Programs in Integrative Medicine and Planetary Health. In this equally split role, Ms. Nusrat will support the Osher Center’s operations and, in partnership with the leadership team, develop new programming and collaborative initiatives at the interface of integrative medicine and planetary health.
## 2021 GRAND ROUNDS PRESENTATIONS AND ATTENDANCE

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<th>Month</th>
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<th>Program/Institution</th>
<th>Title</th>
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<th>Attended Live</th>
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<tr>
<td>2-Feb</td>
<td>Amy Peters, PhD; Zaina Chenault, MD, MSCE; Steven Atlas, MD, MPH; Julia Lewenstall, MD</td>
<td>Massachusetts General Hospital, Brigham and Women’s Hospital</td>
<td>Integrative Geriatrics: Clinical Approaches to Healthy Aging.</td>
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<td>3-Mar</td>
<td>Rebecca Wells, MD, MPH</td>
<td>Department of Neurology, Wake Forest Baptist Health</td>
<td>Does Mindfulness Help Migraine? What Does the Evidence Show? One Researcher’s Journey to Understanding This Question.</td>
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<td>6-Apr</td>
<td>Eric Roseen, DC, MScc</td>
<td>Boston University School of Medicine</td>
<td>Accessing Chiropractic Care for Back Pain After Going to a Primary Care Provider: Barriers and Implementation Strategies</td>
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<td>4-May</td>
<td>Joseph Loscalzo, MD, PhD</td>
<td>Department of Medicine, Brigham and Women’s Hospital</td>
<td>Food As Inmate Drug Source: Novel Strategies for Drug Development in the Era of Big Data.</td>
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<td>3-Aug</td>
<td>JoAnn Mason, MD, MPH, DPH</td>
<td>Brigham and Women’s Hospital</td>
<td>Navigating Uncharted Territory: Providing Integrative Therapies During a Pandemic.</td>
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<td>6-Jul</td>
<td>Gloria Yeh, MD, MPH</td>
<td>Osher Center for Integrative Medicine</td>
<td>Studying The Interaction Between Mind-Body and Physical Activity in Cardiopulmonary Disease.</td>
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<td>3-Aug</td>
<td>JuAnn Mason, MD, MPH, DPH</td>
<td>Division of Preventive Medicine, Brigham and Women’s Hospital</td>
<td>How Vital are Vitamin D and Omega 3 for Cardiovascular Health?</td>
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<tr>
<td>1-Jun</td>
<td>Irene Martyrulik, MSc, LAc; Lorrie Kubicek, MT-BC; Jeffrey Peppercorn, MD, MPH</td>
<td>Brigham and Women’s Hospital, Massachusetts General Hospital</td>
<td>Eye-Mind Grid: A Novel Approach to Fostering Health and Rapport</td>
<td>269</td>
<td>165</td>
</tr>
<tr>
<td>2-Nov</td>
<td>Zaina E. Chenault, MD, MSCE; Jennifer Freeburn, MS CCC-SLP</td>
<td>Osher Center for Brain Health, Center for Neurotechnology and Neuroimaging, Massachusetts General Hospital</td>
<td>Fall 2021 Update in Multidisciplinary Care for Post-Acute Covid 19 Syndrome: Why Keeping Hope is Key</td>
<td>85</td>
<td>52</td>
</tr>
<tr>
<td>7-Dec</td>
<td>Adam Rindfleisch, MPH, MD</td>
<td>Whole Health School of Medicine and Health Sciences in Arkansas</td>
<td>Building an Integrative/Whole Health Medical School From the Ground Up: The Promises and Perils of Starting From Scratch</td>
<td>183</td>
<td>86</td>
</tr>
</tbody>
</table>

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**APPENDIX 1: GRAND ROUNDS PRESENTATIONS AND ATTENDANCE**

**APPENDIX 2: SUMMARY OF ACTIVE RESEARCH STUDIES**

In 2021, our portfolio of research included a total of 36 active studies, ranging from studies just being launched to studies focused on data analysis and finalization of manuscripts. 24 of these studies were funded by NIH, 6 by foundation grants and 6 by internal funds. Icons correspond with key research domains.
### ACTIVE PROJECTS

<table>
<thead>
<tr>
<th>Study/Project Title</th>
<th>Funding Source</th>
<th>Summary Description</th>
<th>PI/ Key Other Investigators/Affiliates</th>
<th>Research Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mindful steps in COPD and HF</td>
<td>(NCI) R34 AI09954</td>
<td>2019-2022</td>
<td>This study develops, refines and tests feasibility in an RCT of a multi-intervention mediated mind-body, health education, and wearable device intervention to promote walking, motivation, self-efficacy in COPD and heart failure. (N=42)</td>
<td>Yeh (PI) Mly (co-I) Wayne (consultant)</td>
</tr>
<tr>
<td>Mindful treadmill walking in metabolic syndrome</td>
<td>(NCI) T32 AT005436</td>
<td>2018-2021</td>
<td>This is a pilot RCT of mindful (audio-recorded) treadmill vs. regular treadmill walking program to begin to dismantle mind-body exercise, examining both acute and longitudinal cardiopulmonary physiology and psychological measures. (N=20)</td>
<td>Kraemer (PI) Yeh (mentor) Wayne (mentor)</td>
</tr>
<tr>
<td>Mindfulness, training, insomnia, and EEG complexity</td>
<td>(NCI) T32 AT005436</td>
<td>2019-2022</td>
<td>This pilot RCT examines acute and longitudinal effects of pre-sleep mindfulness meditation via mobile app on pre-sleep wakefulness and sleep brain dynamics assessed with conventional and non-linear EEG complexity frameworks. (N=10)</td>
<td>Ma (PI) Yeh (mentor) Wayne (mentor) Peng (co-I) Ahn (co-I)</td>
</tr>
<tr>
<td>Mindfulness-based interventions for persons living with HIV and with increased CVD risk</td>
<td>(NCI) R21 AT00665</td>
<td>2020-2023</td>
<td>This study uses secondary analyses to examine associations between mindfulness, psychological functioning and adaptive health behaviors for patients with HIV and increased cardiovascular risk.</td>
<td>Folksy (PI) Batchelder (mentor) Yeh (mentor)</td>
</tr>
<tr>
<td>Multimodal tele-video mind-body intervention for NI-BI</td>
<td>(NCI) K23 AT01065</td>
<td>2020-2025</td>
<td>This study will develop, refine and test feasibility in an RCT of a mind-body resiliency program delivered remotely via video for anxiety in patients with traumatic brain injury. (N=50)</td>
<td>Greenberg (PI) Vrancourt (mentor) Yeh (mentor)</td>
</tr>
<tr>
<td>Ongoing for cancer caregivers</td>
<td>(NCI) R24 AT010881</td>
<td>2019-2022</td>
<td>This mixed methods RCT compares in-person vs. telehealth delivery of a 12-week intervention for cancer caregivers. (N=40)</td>
<td>Wayne (MPI) Budhiani (MPI) Yeh (consultant)</td>
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<td>Stress management and resiliency program for fear of cancer recurrence</td>
<td>(NCI) K23 AT010157</td>
<td>2019-2024</td>
<td>This study will develop, refine and test feasibility in an RCT of a 4-week resiliency program for fear of recurrence in cancer survivors, and explore impact on psychological symptoms and healthcare engagement. (N=48)</td>
<td>Hall (PI) Park (mentor) Yeh (mentor)</td>
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<td>Tai Chi and chronic pain in HIV</td>
<td>(NCI) K23 AT010099</td>
<td>2019-2024</td>
<td>This study will develop, refine and test feasibility in an RCT of an adapted Tai Chi Easy program for HIV patients with chronic pain, and explore its impact on psychological symptoms. (N=40)</td>
<td>Dunne (PI) Yeh (mentor)</td>
</tr>
<tr>
<td>Tai-chi, multisite pain, and fall risk</td>
<td>(NIA) R55AG062737</td>
<td>2019-2021</td>
<td>This pilot randomized clinical trial evaluates the effectiveness of a 16-week mind-body intervention on pain and function in older adults with chronic multisite pain. (N=20)</td>
<td>YouLivik (MPI) Wayne (consultant) Yeh (consultant)</td>
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<tr>
<td>Tele-Tai Chi: A mobile Tai Chi platform for fall prevention in older adults</td>
<td>(NIA) R43 AG059491</td>
<td>2018-2022</td>
<td>This study, in partnership with industry, aims to develop a virtual Tai Chi training that can be delivered via tele-health, and using wearable sensor technology to remotely assess clinical outcomes related to fall risk. (N=20)</td>
<td>Wayne (MPI) Bonato (MPI) BioSensics, Inc (Industry partner)</td>
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<th>PI/ Key Other Investigators/Affiliates</th>
<th>Research Domain</th>
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</thead>
<tbody>
<tr>
<td>Acupuncture for breast cancer lymphedema</td>
<td>(Osher Pilot)</td>
<td>2020-2022</td>
<td>RCT of acupuncture treatment in breast cancer lymphedema patients who are ineligible for radiotherapy lymphatic surgery. Outcomes: feasibility, biopsychosocial metrics, lymphatic function markers. (N=20)</td>
<td>Sinha (PI) Yeh (co-I) Liu (co-I)</td>
</tr>
<tr>
<td>Gait health as a clinical outcome</td>
<td>(Palmer Foundation)</td>
<td>2020-2024</td>
<td>This feasibility study assesses integration of gait health parameters (Zeno Gait System) into patient visits at Osher Clinic.</td>
<td>Wayne (PI) Kowalski (co-I)</td>
</tr>
<tr>
<td>Mindfulness and tai chi for cancer health: The MATCH trial</td>
<td>(Hecht Foundation)</td>
<td>2018-2023</td>
<td>This Canada-based pragmatic patient preference trial randomizes 500 patients with metastatic breast cancer to one of three interventions focused on mindfulness and Tai Chi for cancer health.</td>
<td>Carlson (PI) Wayne (co-I)</td>
</tr>
</tbody>
</table>
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<tbody>
<tr>
<td>Orthopedics for chronic knee arthritis pain: Can mindfulness change the composition of platelet-rich plasma (PRP)? (Osher Pilot)</td>
<td>2020-2022</td>
<td>This study aims to identify molecular biomarkers and examine the potential of integrative medicine to enhance response to platelet-rich plasma.</td>
<td>Hall (MPI), Voia (MPI)</td>
</tr>
<tr>
<td>Non-verbal measurement of negative self-conscious emotion (Osher Pilot)</td>
<td>2020-2022</td>
<td>Pilot study using facial gesture, posture, and voice acoustic analyses along with machine learning algorithms to identify objective markers of shame in men diagnosed with HIV and who engage in risky behaviors.</td>
<td>Batchelder (PI), Bonato (co-I), Wayne (co-I)</td>
</tr>
<tr>
<td>Tai chi plus chiropractic for chronic neck pain in nurses (Palmer and Van Stouw Foundations)</td>
<td>2021-2022</td>
<td>Pre-post feasibility study evaluating pragmatic (community-based) delivery of combined tai chi and chiropractic care for chronic neck pain. Primary outcomes: feasibility, neck pain, function, postural control. Mixed methods.</td>
<td>Wayne (PI), Konwakati (co-I), Rost (co-I)</td>
</tr>
<tr>
<td>Pre-sleep EEG brain dynamics and mindfulness meditation in insomnia (Osher Pilot)</td>
<td>2019-2021</td>
<td>This proof-of-concept pilot randomized controlled trial explores feasibility of an app-based mindfulness intervention in patients with insomnia and evaluates both acute and longitudinal changes in brain physiologic signals (e.g., EEG spectral analyses and complexity analyses) with pre-sleep meditation.</td>
<td>Yeh (PI)</td>
</tr>
<tr>
<td>Epidemiologic risk factors for COVID-19 across three established cohorts of older US adults (BWH COVID Fund)</td>
<td>2020</td>
<td>This study leverages data from three large epidemiologic studies to evaluate the impact of exercise and lifestyle on risk of COVID infection and its impact on overall well-being.</td>
<td>Wayne (MPI)</td>
</tr>
<tr>
<td>Establishing a clinician-researcher chiropractic postdoctoral fellowship at the Harvard Medical School/Brigham and Women’s Hospital-Osher Center for Integrative Medicine (NCIMC Foundation)</td>
<td>2021-2024</td>
<td>This gift supports the training of a chiropractic clinician-research fellow at the Osher Center for a 3-year period.</td>
<td>Wayne (MPI), Konwakati (MPI)</td>
</tr>
<tr>
<td>Stress Management and Resiliency Training (SMART) for employees and their family members (Mass General Brigham Systems Behavioral and Mental Health Grant)</td>
<td>2021</td>
<td>This clinical project aims to improve access to behavioral health care for MBG employees and their covered family members through subsidies for participation in the SMART program at BWH/MSH. In the first year of this project, approximately 100 patients benefited from the subsidy.</td>
<td>Muhita (MPI), Konwakati (MPI)</td>
</tr>
<tr>
<td>Intermittent fasting in duchenne traditions (Liberal Foundation for Religious Studies)</td>
<td>2021</td>
<td>Day-long virtual conference focusing on the science and practice of intermittent fasting. More than 650 participants registered for event.</td>
<td>Muhita (PI), Rath (co-I)</td>
</tr>
</tbody>
</table>

### SUBMITTED/PENDING GRANTS

<table>
<thead>
<tr>
<th>Study/Project Title (Target Funding Source)</th>
<th>Brief Summary of Planned Study</th>
<th>PI/ Key Other Investigators</th>
<th>Research Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>A novel strategy for precision IBS pain relief using natural supplements (NCCIH R01)</td>
<td>This study is the first to prospectively address the high placebo response rate in IBS, a chronic pain condition, by introducing a pharmacogenomic biomarker and strategy to identify which population subset will benefit from quercetin or placebo treatment (N=240).</td>
<td>Hall (MPI), Lembo (MPI), Kapitnik (co-I)</td>
<td></td>
</tr>
<tr>
<td>Acupuncture for pain reduction and opioid sparing in head and neck cancer: A pilot randomized controlled trial (NCCIH R34)</td>
<td>Upfront naïve patients taking prescription opioids for acute pain increase the risk for developing new persistent opioid use. To inform the feasibility and design of a future definitive trial, the goal of this application is to perform a pilot study of preemptive acupuncture for reducing opioid use in head and neck cancer patients. (N=30)</td>
<td>Wayne (MPI), Lu (MPI), Rist (co-I)</td>
<td></td>
</tr>
<tr>
<td>Chiropractic care for episodic migraines: A multisite pragmatic trial (NCCIH U01)</td>
<td>Multisite pilot pragmatic RCT of chiropractic care plus enhanced usual care (ECU) vs ECU alone for episodic migraines. Outcomes include feasibility and preliminary estimates of impact on migraine days, headache disability, and neck pain. (N=120)</td>
<td>Wayne (MPI), Rist (MPI), Kowalski (co-I), Buring (co-I)</td>
<td></td>
</tr>
<tr>
<td>Enhancing aerobic intensity of a Tai chi intervention for sedentary individuals with cardiovascular risk (NCCIH U01)</td>
<td>The benefit of exercise and increasing cardiorespiratory fitness to decrease morbidity and mortality due to cardiovascular disease is well-known. This is an application developing an aerobically enhanced tai chi intervention in preparation for a future RCT examining higher intensity tai chi on cardiorespiratory fitness in sedentary individuals with CV risk. (N=30)</td>
<td>Yeh (MPI), Wayne (MPI), Rist (co-I)</td>
<td></td>
</tr>
<tr>
<td>Tai chi exercise and wearable feedback technology to promote physical activity in ACS survivors (NCCIH R01)</td>
<td>Phase 2 RCT of a 6-month remote tai chi program plus wearable feedback device (Fitbit) vs enhanced usual care in sedentary acute coronary syndrome survivors. Outcomes: physical activity (accelerometry), cognitive-behavioral constructs, CHD risk factors. (N=156)</td>
<td>Wayne (MPI), Rist (co-I), Kowalski (co-I)</td>
<td></td>
</tr>
<tr>
<td>Combined chiropractic care and tai chi for chronic non-specific neck pain (NCCIH R34)</td>
<td>Chronic neck pain ranks in the top five causes for years lived with disability. To inform the feasibility and design of a future definitive trial, the goal of this application is to perform a pilot study of chiropractic care and Tai Chi mind-body exercise for adults with chronic non-specific neck pain (N=60).</td>
<td>Wayne (PI), Rist (co-I), Kowalski (co-I)</td>
<td></td>
</tr>
<tr>
<td>Tai chi, executive function, and gait health in adults at risk for cognitive decline (NIA R01)</td>
<td>This randomized clinical trial will evaluate the effects of Tai Chi mind-body exercise for preserving age-related decline in executive cognitive function and associated gait health in older adults. The project addresses the critical need of identifying early interventions that will possibly arrest the growing dementia epidemic in our aging society. (N=30)</td>
<td>Wayne (MPI), Lipiatz (MPI), Rist (co-I), Manor (co-I), Hausdorff (co-I)</td>
<td></td>
</tr>
<tr>
<td>Using deep learning to understand combined influence of genomics and sex hormones on symptom severity in intractable bowel syndrome (IBS) (Mass Life Sciences Center)</td>
<td>Individual and combinatorial effects of chronic pain genes and sex hormones on IBS pain severity and frequency with randomized peppermint versus placebo.</td>
<td>Hall (MPI), Lembo (co-I)</td>
<td></td>
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**Appendix 2. Summary of Active Research Studies (continued)**

**Appendix 3. Summary of Submitted & Pending Grant Applications & Research Studies**
### SUBMITTED/PENDING GRANTS

<table>
<thead>
<tr>
<th>Study/Project Title</th>
<th>Brief Summary of Planned Study</th>
<th>PI/ Key Osher Investigators</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Exploring brain dynamics and mechanisms of mindfulness-based interventions for insomnia (NCCIH K23)</td>
<td>Development/feasibility testing in an RCT of mobile app-based mindfulness intervention vs. wait-list control in insomnia. Exploring acute and longitudinal change in physiological signals (EEG/ECG dynamics, complexity) of sleep quality.</td>
<td>Ma (PI), Yeh (mentor), Wayne (mentor), Rist (co-I)</td>
<td>NCCIH</td>
</tr>
<tr>
<td>Yoga for post-surgical persistent pain in breast cancer survivors (NCCIH)</td>
<td>Development/feasibility testing in an RCT of yoga vs. control for pain and psychosocial distress in breast cancer survivors with persistent post-surgical pain.</td>
<td>Munoz-Vergara (PI), Wayne (mentor), Schreiber (mentor), Yeh (co-I), Rist (co-I)</td>
<td>NCCIH</td>
</tr>
<tr>
<td>Promoting resilience through non-invasive Pain therapy management (DOD PRMRP)</td>
<td>The goal of this proposal is to conduct trials of non-invasive treatments to help military personnel develop resilience for pain management.</td>
<td>Wayne (co-I)</td>
<td>NCCIH</td>
</tr>
<tr>
<td>Physiological outcomes of mind-body health behaviors for stress-related disorders (NCCIH F32)</td>
<td>This is a pre-doctoral early career development award that supports a project to examine pranayama, hyper-arousal and cardiovascular reactivity in female sexual trauma survivors.</td>
<td>Sinnott (PI), Yeh (co-mentor)</td>
<td>NCCIH</td>
</tr>
<tr>
<td>Decreasing sedative requirements for peripheral vascular interventions using preparative guided meditation. (Agency for Healthcare Research and Quality)</td>
<td>This early career post-doctoral development award supports the development and piloting of a novel preoperative guided meditation program to decrease sedative requirements in patients undergoing vascular surgery intervention.</td>
<td>Png (PI), Yeh (co-mentor)</td>
<td>NCCIH</td>
</tr>
<tr>
<td>Biophysical assessments of acupoints in inflammatory bowel disease (NCCIH)</td>
<td>Using a neuro-inflammation framework and Irritable Bowel Disease (IBD) as a model for studying acupuncture sensitization and viscerosomatic convergence, this pilot study will conduct biophysical assessments of acupoints and non-acupoint controls in both IBD and healthy patients to inform the design of a future fully powered study.</td>
<td>Yang (PI), Wayne (mentor), Napadow (mentor), Korzenik (co-I), Ahn (co-I), Rist (co-I)</td>
<td>NCCIH</td>
</tr>
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### Appendix 3: Summary of Submitted & Pending Grant Applications & Research Studies (continued)

### Appendix 4: Lectures by Osher Center Directors, 2021

- **Donald Levy**
  - **Complementary and integrative medicine approaches to chronic pain management**
  - Office Practice of Primary Care medicine
  - Brigham and Women’s Hospital (BWH), Harvard Medical School (HMS)

- **Complementary and integrative medicine in the general internists practice**
  - Innovations and New Practices in Internal Medicine 2021
  - BWH, HMS

- **Finding high quality dietary supplements for stress, anxiety and burnout**
  - Advancing Women’s Health: A 2021 Update, BWH

- **Kathryn Hall**
  - **Placebos in medicine**
  - Grand Rounds, Division of Gastroenterology
  - Boston Children’s Hospital (BCH), HMS

- **Health disparities and nocebo effects in clinical care**
  - Program in Placebo Studies
  - Beth Israel Deaconess Medical Center (BIDMC), HMS

- **How expectations influence clinical outcomes**
  - Harvard Catalyst: Visiting Research Internship Program, HMS

- **Matthew Kowalski**
  - **Position in Life is Everything, Caring for Your Spine**
  - First year medical students
  - HMS

- **Darshan Mehta**
  - **Positivity and relaxation training**
  - Workshop
  - Department of Radiation Oncology, Massachusetts General Hospital (MGH)

- **Clinical trials of tai chi: Unique challenges inherent in evaluating multi-component non-pharmacological interventions**
  - Invited Lecture
  - Master of Medical Science in Clinical Investigation Program, HMS

- **Gloria Yeh**
  - **Mind-body exercise in patients with COPD: Results from the LEAP study**
  - General Medicine Grand Rounds
  - BIDMC, HMS

- **Positivity and relaxation training**
  - Workshop
  - Baccalaureate Association, MGH

- **Update on the Office for Well-Being**
  - Invited Presentation
  - Executive Committee on Research, MGH

- **Well-being - Galvanizing change (slowly) from the individual to the system level**
  - Grand Rounds
  - Department of Radiology, MGH/BWH

- **Peter Wayne**
  - **Mind-body research: Towards an embodied approach**
  - Faculty Presentation
  - Harvard Medical School T32 Fellowship in Integrative Medicine Research, BIDMC

- **Tai chi for fall prevention**
  - Invited Faculty Lecture
  - Department of Preventive Medicine, BWH/HMS

- **Clinical trials of tai chi: Unique challenges inherent in evaluating multi-component non-pharmacological interventions**
  - Invited Lecture
  - Master of Medical Science in Clinical Investigation Program, HMS

- **Positivity and relaxation training**
  - Workshop
  - Post-Doctoral Fellows, BWH, MGH

- **Positivity and relaxation training**
  - Workshop
  - Graduate Student Division, HMS
Donald Levy  
**Rational use of dietary supplements**  
Invited Lecture  
Primary Care Now, Ptn Med Institute  

**Using botanicals and other dietary supplements in the management of stress, anxiety and burnout**  
Invited Lecture  
Osher Collaborative Clinical Committee Speaker Series  

Kathryn Hall  
**Placebos and nocebos in medicine**  
Invited Lecture  
University of California, San Francisco, Osher Center for Integrative Medicine  

Panacea or poison: Placebos and nocebos in modern medicine  
The Helix Center, New York City  
Invited Lecture  

How to engage community response to COVID vaccine  
Moderator  
American Society of Human Genetics (ASHG) Webinar  

Darshan Mehta  
**What does resiliency mean for you? A primer**  
Invited Presentation  
New England Clinical Oncology Society, Virtual Meeting  

**Supporting clinicians through COVID-19 and beyond**  
Grand Rounds  
Boston HealthCare for the Homeless, Virtual Meeting  

Building resiliency for ourselves in the era of COVID-19  
Psychiatry Grand Rounds  
Thomas Jefferson University and Jefferson Health, Philadelphia, PA, Virtual Meeting  

Applying meditation at the organizational level  
Invited Presentation  
TexMed 2021 Annual Meeting  
Virtual Meeting  

An overview of well-being  
Invited Presentation  
American Society of Neuroradiology Annual Meeting  
Virtual Meeting  

Crucial conversations: Racism and healthcare in the Asian, Asian-American, Pacific Islander, and South Asian communities  
Invited Panel Discussion  
Academy of Integrative Health and Medicine  
Virtual Meeting  

TOS/PCNA Joint Symposium: Keeping the healthcare provider engaged and preventing burnout  
Invited Symposium  
The Obesity Society Annual Meeting  
Virtual Meeting  

**Resilience and well-being**  
Invited Plenary Session  
Academy of Integrative Health and Medicine Annual Conference  
Virtual Meeting  

Resilience and well-being  
Invited Panel Presentation  
2021 Virtual CTSA Program Meeting  
National Center for Advancing Translational Sciences at the National Institutes of Health, Bethesda, MD, Virtual Meeting  

Peter Wayne  
**Exercising your body and mind: Tai chi for balance, cognition, and wellness in Parkinson’s disease**  
Invited Lecture  
Goddard House, Boston, MA  

**Tai chi as integrative medicine**  
Invited Speaker  
Massachusetts College of Pharmacy and Health Sciences, Worcester, MA  

**Tai chi for preventing falls and cognitive decline in older adults**  
Invited Speaker  
Boston Public Library, MA  

**Bringing the body back into mind-body research**  
Invited Lecture  
College of the Atlantic, ME  

**Tai chi training as integrative medicine**  
Invited Lecture  
University of East-West Medicine, Sunnyvale, CA  

Integrating health with Tai chi: Studies of chronic heart failure, balance, cognition and pain  
Georgetown University School of Medicine, MD  

East-Asian mind-body practices  
Invited Virtual Lecture  
UCSF Integrative Medicine Training Fellowship  
UCSF Osher Center, San Francisco, CA  

Virtual delivery of mind-body interventions  
Panel speaker  
Osher Research Collaborative  
UCSF Osher Center, San Francisco, CA  

Chiropractic care and integrative health  
Invited Virtual Lecture  
Logan University, Chesterfield, MO  

Tai chi for whole person health and healthy aging  
Invited Virtual Grand Rounds Lecture  
Feinberg School of Medicine, Northwestern University, Chicago, IL  

Tai chi for whole person health and healthy aging  
Invited Virtual Lecture  
University Hospitals Connors Whole Health, Cleveland, OH  

Tai chi and qigong: Understanding the healing benefits of mind-body exercises for cancer patients  
Invited Virtual National Lecture  
Anticancer Lifestyle Foundation, Concord, NH  

Gloria Yeh  
**Laying the foundation: Defining building blocks of music-based interventions**  
Invited Panelist  
National Institutes of Health Sound Health Initiative, Music and Health Working Group  
Virtual Meeting  

Assessing and measuring target engagement: Mechanistic and clinical outcome measures for brain disorders of aging  
Invited Panelist  
NIH Sound Health Initiative, Music and Health Working Group  
Virtual Meeting
Appendix 6. International Lectures by Osher Center Directors, 2021

Kathryn Hall
Predictability of clinical placebo responses
Invited presentation
Society of Interdisciplinary Placebo Studies Conference, Baltimore, MD
Molecular mechanisms of placebo response: From genes to pathway
Chair and speaker
Society of Interdisciplinary Placebo Studies Conference, Baltimore, MD
Educational session on career development
Panelist
Society of Interdisciplinary Placebo Studies Conference, Baltimore, MD

Darshan Mehta
Experiences of health services in integrative medicine
Invited presentation
II World Summit on Traditional and Complementary Medicine towards an Integrative Medicine, Medical College of Peru, Virtual meeting

Gloria Yeh
Mind-body movement and cardiopulmonary health
Toronto-Ottawa Heart Summit- International Conference on Cardiopulmonary Disease: Protocol for a randomized controlled trial.

Peter Wayne
The science of “Qi”
Invited speaker
World Tai Chi & Qigong Day Summit (Virtual)

Qigong as an ecological mind-body practice
Invited presenter
Mind and Life Institute, Charlottesville, VA (Virtual)

Ecology of mind body
Invited podcast/interview
Mind and Life Institute, Charlottesville, VA (Virtual)

Choosing a control group: An example from mind-body research
 Symposium Presenter
University of Ottawa Heart Institute

Appendix 7: Osher Directors’ and Core Faculty Publications


A mind-body program for pain and stress management in active duty service members and veterans.

A pilot study of a stress management program for incarcerated veterans.

Acupuncture research in animal models: rationale, needling methods and the urgent need for a stricta-strainia adaptation.

An ethnographic study of opioid use disorder in rural Maine: The problem of pain.

An exploratory analysis of the association between Catechol-O-methyltransferase and response to a randomized open-label placebo treatment for cancer-related fatigue.

Development of a novel intervention (mindful steps) to promote long-term walking behavior in chronic cardiopulmonary disease: Protocol for a randomized controlled trial.

Efficacy of cognitive behavioral therapy for insomnia in breast cancer: A meta-analysis.

Evaluation of a yoga-based mind-body intervention for resident physicians: a randomized clinical trial.

Exploring correlates of improved depression symptoms and quality of life following tai chi exercise for patients with heart failure.
Luberto CM, Coey CA, Davis RB, Wayne PM, Crute S, Yeh GY. ESC Heart Fail. 2020;7(6):4209-12.

Exploring tai chi exercise and mind-body breathing in patients with COPD in a randomized controlled feasibility trial.

Factors influencing preference for intervention in a comparative effectiveness trial of mindfulness-based cancer recovery and tai chi/qigong in cancer survivors.

Gait variability is associated with the strength of functional connectivity between the default and dorsal attention brain networks: evidence from multiple cohorts.

Impact of a yogic breathing technique on the well-being of healthcare professionals during the covid-19 pandemic.

Improved health outcomes in integrative medicine visits may reflect differences in physician and patient behaviors compared to standard medical visits.

Initial management of acute and chronic low back pain: Responses from brief interviews of primary care providers.

Long-term Exercise After Pulmonary Rehabilitation (LEAP): A pilot randomized controlled trial of Tai Chi in COPD.

Lower distress tolerance is associated with greater anxiety and depression symptoms among patients after acute coronary syndrome.
Managing the experience of breathlessness with Tai Chi: A qualitative analysis from a randomized controlled trial in COPD.

Moderators of a resiliency group intervention for frontline clinicians during the COVID-19 pandemic.

Multimodal chiropractic care for migraine: A pilot randomized controlled trial.

NHLB1-CMRI5 workshop report on pulmonary vascular disease.

Open-label placebo vs double-blind placebo for irritable bowel syndrome: a randomized clinical trial.

Perceptions of chiropractic care among women with migraine: A qualitative sub-study using a grounded-theory framework.

Profile of subjective-objective sleep discrepancy in patients with insomnia and sleep apnea.

Ongoing mind-body program for caregivers of cancer patients: design of a pilot three-arm randomized clinical trial.

Randomized controlled trials of mindfulness and acceptance-based interventions over the past two decades: a bibliometric analysis.

Stress management and resiliency training for healthcare professionals: A mixed-methods, quality-improvement, Cohort Study.

Tai Chi for health and well-being: A bibliometric analysis of published clinical studies between 2010 and 2020.

Tai Chi training’s effect on lower extremity muscle co-contraction during single- and dual-task gait: Cross-sectional and randomized trial studies.

The impact of Tai Chi and mind-body breathing in COPD: Insights from a qualitative sub-study of a randomized controlled trial.

The impact of tai chi exercise on health care utilization and imputed cost in residents of low-income senior housing.

Wellness program implementation in an academic radiology department: Determination of need, organizational buy-in, and outcomes.

What do placebo and nocebo effects have to do with health equity? The hidden toll of nocebo effects on racial and ethnic minority patients in clinical care.