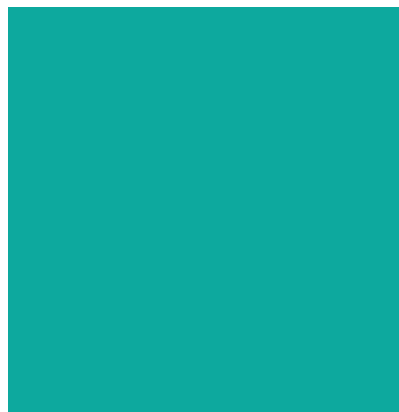
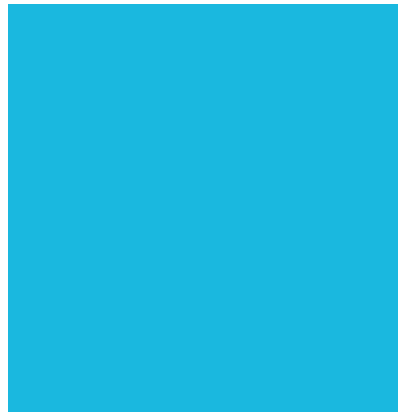
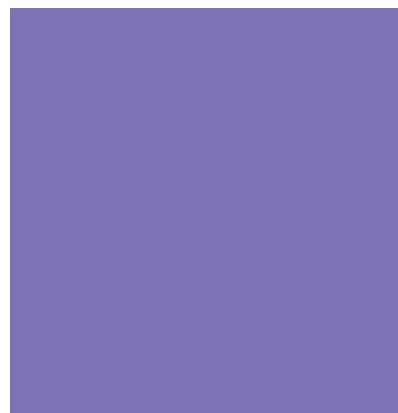
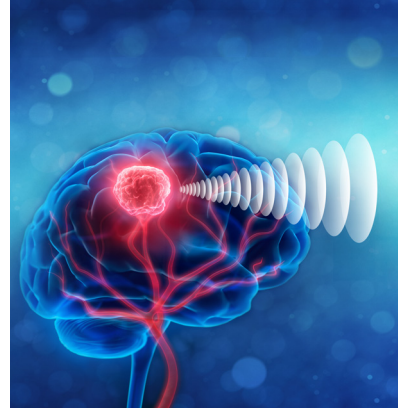




Focused Ultrasound Foundation

2021
Midyear Report





Growth and Progress Despite Confusing Times

We were hoping by this time Covid's grip on the way we live and work would have relented. Unfortunately, this has not occurred and there remains often confusing rules and regulations impacting where and how we work, travel, and learn.

But the good news is that the Foundation staff and focused ultrasound community at large have adjusted to operating in this state of uncertainty. The field continues to grow—to thrive, actually—with increasing momentum, as documented here and in our recent 2021 State of the Field report.

This year has already seen first-in-human clinical trials, important brain and body studies, workshops, strategic partnerships, reimbursement wins, developments in Asia—and even a record number of interns and fellows at the Foundation.

This widespread progress is a testimony to the commitment of all the stakeholders in the focused ultrasound community to improve the lives of millions of people around the world with a wide variety of serious medical disorders.

We thank you for your continued interest, support, and effort. Be well.

Neal F. Kassell, MD

▶ Global research institutions have pioneered focused ultrasound in the areas of veterinary cancer, MR imaging, transcranial histotripsy, and liver tumors.

preclinical studies ▶

Improving MRI for Focused ultrasound

A collaborative team of researchers at the **University of Virginia** and **Virginia Polytechnic Institute and State University** developed a transcranial focused ultrasound treatment bath that is invisible during MRI scans. Because degassed water degrades the quality of the MR-guided images, this important and innovative advance could be used to replace degassed water as an acoustic coupling bath. The newly designed coupling bath material contains specially designed iron oxide nanoparticles. ■



Clinical trial Veterinary cancer

Researchers at **Oklahoma State University** studied whether two types of focused ultrasound—mechanical and thermal ablation—would be effective in treating various types of low-grade tumors in dogs. The group treated a total of 11 dogs with six different types of tumors and then compared the therapeutic and immunological effectiveness of the treatments. Several of the dogs had complete tumor remission. ■



What is Histotripsy?

Histotripsy is a mode of focused ultrasound involving very short, high-intensity ultrasound pulses (powerful pressure waves) to mechanically break up tissue to destroy it.

Histotripsy is a fundamentally different mechanism of action than thermal ablation and could allow for much faster treatment times, as it enables single-session treatment of much larger targets than possible with thermal ablation. ■

Cholangiocarcinoma Liver tumors

Preclinical researchers at **Virginia Polytechnic Institute and State University** completed a study to determine the optimal histotripsy parameters to ablate cholangiocarcinoma, a rare liver cancer with a low 5-year survival rate of 10%. The study was conducted in collaboration with **Hospital Universitari Mutua de Terrassa** in Barcelona, Spain, that provided human liver tissue specimens for use in histotripsy experiments. ■

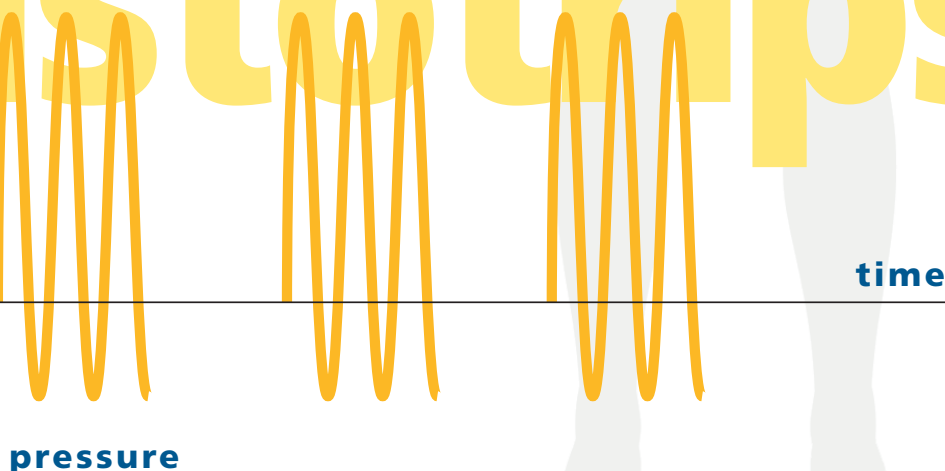



Transcranial Histotripsy

Researchers at the **University of Michigan** completed in-vivo brain histotripsy experiments in a preclinical model to demonstrate the safety of the technique. This project, which is currently in review for academic publication, helped move the technology closer to clinical work with histotripsy for brain tumor treatment. ■



histotripsy



 The brain is considered the vanguard target for focused ultrasound. Important human studies are assessing treatment for glioblastoma and liquid biopsy to improve brain tumor marker detection.

clinical trials

Glioblastoma BBB opening + chemotherapy

A new clinical trial is underway at **Northwestern University** in Chicago, Illinois, for patients with recurrent glioblastoma (GBM).

Phase I of the trial is determining the safe dose of the chemotherapy drug Abraxane®; phase II will evaluate the effectiveness of combining the drug with opening the blood-brain barrier using CarThera's SonoCloud device after surgical removal of the recurrent GBM. ■



Glioblastoma Sonodynamic therapy

The first three high-grade glioma patients have been enrolled in a new sonodynamic therapy and focused ultrasound clinical trial at the **Ivy Brain Tumor Center** at Barrow Neurological Institute in Phoenix, Arizona. This trial is investigating the use of focused ultrasound to treat patients with recurrent GBM and other high-grade gliomas. Researchers are exploring sonodynamic therapy—or using focused ultrasound to activate a drug to cause cell death only in the tumor—in these patients. ■



Enhanced blood testing Brain tumors

Researchers from **Sunnybrook** and the **University of Toronto** completed the first clinical study to test the ability of focused ultrasound to enhance brain tumor biomarker detection from a routine blood sample. Nine patients with GBM underwent the technique—called liquid biopsy—before and after focused ultrasound treatment that disrupted the blood-brain barrier to enhance chemotherapy delivery. The results suggest that liquid biopsy could reduce the need for invasive brain tumor biopsies and allow for better monitoring of GBM treatment responses.

The world-first results were published in the *Journal of Neuro-Oncology*. ■



To detect cancer biomarkers through a blood test could provide a diagnosis for patients and either avoid an operation or allow the surgery to be planned in advance.”

— James Perry, MD
Sunnybrook

patient spotlight

Barbara's story Glioblastoma

Barbara Frisbie wholeheartedly “loves life.” And she has much to love about her life in Kilmarnock, Virginia, with her husband of 58 years, Rick, their two sons and four grandchildren, and many friends.

On March 5, 2021, Barbara suddenly suffered a seizure and was flown to VCU Medical Center in Richmond, Virginia, where she was diagnosed with a glioblastoma (GBM). GBMs are an aggressive type of malignant brain tumor with a generally poor prognosis.

After completing the initial surgery and radiation, Barbara considered the


poor track record of conventional GBM treatments and decided to pursue a different course: noninvasive focused ultrasound. She recently became the first patient treated in a GBM focused ultrasound clinical trial at the University of Virginia (UVA). The trial—led by Jason Sheehan, MD, PhD, Professor of Neurological Surgery at UVA and the Foundation's Senior Advisor for Brain Tumor Research—aims to open the blood-brain barrier to allow higher concentrations of chemotherapy to enter the brain to destroy any residual tumor tissue and hinder regrowth.

“Rick and I have been involved with the Focused Ultrasound Foundation for many years,” says Barbara. “We believe in the technology and the promise that it holds for humanity. I feel fortunate to be able to take part in a clinical trial.”

“The use of focused ultrasound to open the blood-brain barrier should permit appreciably more chemotherapy to be delivered to brain tumors and, hopefully, lead to therapeutic benefits,” adds Dr. Sheehan. “This approach could be a game changer.” ■



▶ Read Barbara's full story on the Foundation's [website](#).

 Additional major brain research beginning in 2021 is focusing on debilitating pain, Parkinson’s disease, and pediatric DIPG.

clinical trials

Trigeminal neuralgia

A team at the **University of Maryland** has launched a clinical trial investigating the use of focused ultrasound to address trigeminal neuralgia, a chronic and disabling pain condition. Researchers are using focused ultrasound to ablate a small nucleus in the thalamus located deep within the brain—called the central lateral nucleus—which is known to play a role in pain perception and transmission. ■



Parkinson’s disease

A novel pivotal trial validating the use of focused ultrasound to treat the cardinal features of Parkinson’s disease (PD) was published in the *New England Journal of Medicine*.

Professor José Obeso and his team at **HM CINAC** in Madrid, Spain, collaborated with W. Jeffrey Elias, MD, at the School of Medicine at the **University of Virginia**. Both groups used focused ultrasound to successfully ablate a portion of the brain called the subthalamic nucleus, a proven neurosurgical target for treating features of PD. ■




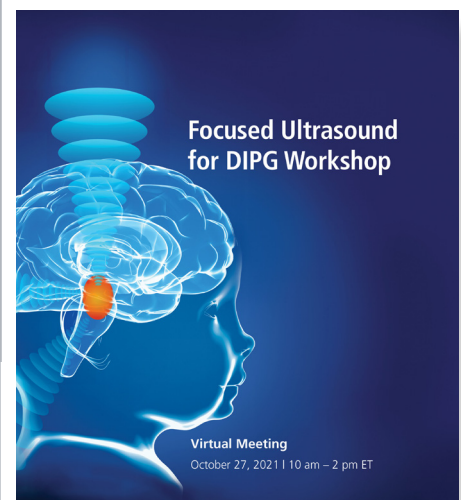
Pediatric DIPG

A team at **Columbia University** has launched their first-in-human clinical trial using focused ultrasound to treat diffuse intrinsic pontine gliomas (DIPGs), a malignant brain tumor that typically affects young children. The phase I trial is assessing the use of focused ultrasound to disrupt the blood-brain barrier to allow increased amounts of chemotherapy to more effectively reach the brain tumor. ■



october meeting

 The Foundation is sponsoring a virtual workshop on focused ultrasound for DIPG in October.



Sponsored by



▶ A first-in-human heart valve disease trial and positive results using focused ultrasound to relieve significant hand movement issues are highlights of clinical trials around the globe.

Focal hand dystonia

A team of researchers in **Japan** led by Takaomi Taira, MD, PhD, investigated whether focused ultrasound thalamotomy could be used to treat focal hand dystonia (FHD), which causes excessive and involuntary muscle contractions in the fingers, hand, and forearm. Researchers concluded that focused ultrasound thalamotomy significantly improved FHD. ■



Aortic stenosis

A team of clinicians and researchers from **France** and **The Netherlands** shared results from a clinical trial using focused ultrasound to treat calcific aortic stenosis, the most common disease for heart valves. The study uses Cardiawave's Valvofsoft®, an investigational device being developed to mechanically soften hardened valves, improve valve function, and reduce symptoms.

The first-in-human results were published in *Circulation*. ■



Inaugural Andrew J. Lockhart Postdoctoral Fellow

Caitlin Tydings, MD, was awarded the inaugural Andrew J. Lockhart Postdoctoral Fellowship in Focused Ultrasound and Immuno-Oncology. At Children's National Hospital, Dr. Tydings is developing focused ultrasound as an immune modulator in pediatric cancers. The one-year fellowship—established through the generosity of the Lockhart family in honor of their son, Andrew J. Lockhart—is designed for early-career researchers as a way for the Foundation to cultivate the next generation of investigators who could advance the development and clinical adoption of focused ultrasound in immuno-oncology. ■



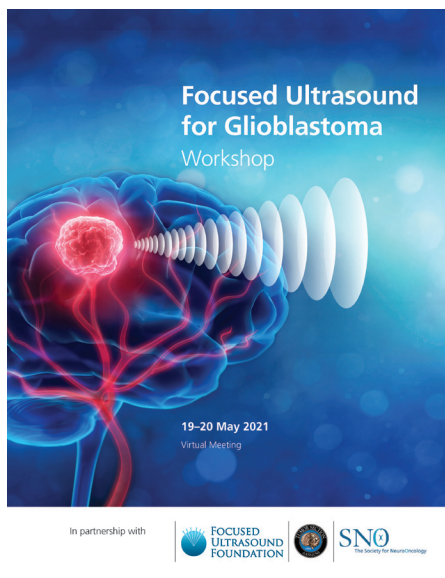
▶ Providing critical space for conversations continues to be a major focus of the Foundation's work and resources.

GBM Workshop

In May, the Foundation partnered with the Society for Neuro-oncology and the AANS/CNS Tumor Section to host a virtual workshop discussing focused ultrasound for GBM. More than 260 attendees from nearly **60 institutions worldwide** convened to share knowledge, identify gaps in evidence, and create a roadmap for the technical developments, laboratory studies, and clinical trials necessary for focused ultrasound to progress in the treatment of GBM. ■

A video archive of the presentations is available on our website. ▼

A white paper summarizing the workshop's proceedings is also available online.



23-28 October 2022 please join us

8th Symposium on Focused Ultrasound

This meeting is being planned as a hybrid virtual and in-person event in Bethesda, Maryland.

The final proceedings from the 7th International Symposium on Focused Ultrasound are now available. The 2020 fall symposium united scientists,

clinicians, and other stakeholders virtually—more than 1,800 participants from 58 countries—to showcase the tremendous progress in the field of focused ultrasound. ■

+250

Scientific presentations

19

Expert panels

▶ Facilitating patient access and commercialization of the technology through strategic professional and trade partnerships remains a priority for the Foundation.

new partnerships

125 Connecting with Professional organizations

The Foundation has partnered with the **American Brain Coalition (ABC)**, joining a group of more than 125 of the United States' leading professional neurological, psychological, and psychiatric organizations. The ABC is a nonprofit umbrella organization that serves as a powerful voice for people with brain disorders by uniting various organizations to try to reduce the burden of these conditions to individuals, families, and society.

Through this relationship, the Foundation hopes to bolster its current advocacy efforts to demonstrate focused ultrasound's potential to treat brain disorders. ■



Advocacy

As part of the Foundation's advocacy efforts, we partnered with the **Medical Device Manufacturers Association (MDMA)**, a national trade association based in Washington, DC, that provides educational and advocacy assistance to innovative and entrepreneurial medical technology companies. Through this partnership, the Foundation and 10 focused ultrasound companies have become members of MDMA. ■



“ We believe it's important to have all the various trade associations—including MDMA, MITA, and AdvaMed—engaged with focused ultrasound companies and the Foundation so they can better understand the issues we face and effectively advocate on our behalf.”

— Jessica Foley, PhD
Chief Scientific Officer
Head of Advocacy and Government Relations
Focused Ultrasound Foundation



 A record number of students and graduates collaborated with the Foundation’s medical, scientific, and communications teams.


Wide range of Internship projects

As part of the 10th year of our robust summer internship program, the Foundation accepted a record 15 students and recent graduates. Their projects ranged from a technical nature—such as analyzing ultrasound wave behavior in a real-world application; constructing computer-based models for treatment planning; and simulating focused ultrasound procedures to improve patient care—to research, advocacy, and communications. ■

Summer Interns

15 students

9 academic institutions

 The Foundation’s summer technical internships are generously funded by the Claude Moore Charitable Foundation.

Baruch College

Telemedicine and Telesurgery White Paper
Isabella Berkeley

Cornell University

Profiling Asia-Based Companies and Conducting Research on Strategies in Relation to Regulatory Approved FUSF Indications
Dylan Shen

North Carolina Central University

Advocacy to Expand Equitable Access to Focused Ultrasound Treatment in Women’s Health
Samia Taliaferro

Penn State University and Harvard University

Review paper on Theranostics in the Vasculature: Bioeffects of Ultrasound and Microbubbles to Induce Vascular Shut Down
Cancer Immunotherapy Landscape Analysis
Jackie Brenner

Piedmont Virginia Community College

HIFU Knee Phantom
Jack Snell

University of Exeter, UK

Focused Ultrasound for Gene Therapy Review
Juliette Strubel

University of Virginia

Sonodynamic Therapy Landscape Analysis
Isha Bhatia

Ultrasound Microbubble Tumor Analysis
Caleb Hallinan

Optimization and Application of a FUSF low-cost Hydrophone Scanning System
Colin Haws

Neuronavigation with VR and Kranion
Adam Kippenhan

Optimizing Internet-Based Electronic Outreach Regarding Focused Ultrasound: Facilitating Broader Understanding, Reach, and Engagement
Darrah Sheehan

Neuronavigation with Kranion
Kathleen Nguyen

University of Virginia School of Medicine

Sonodynamic Therapy Landscape Analysis
Leslie Hansen

Western Albemarle High School

Optimizing Internet-Based Electronic Outreach Regarding Focused Ultrasound: Facilitating Broader Understanding, Reach, and Engagement
Kimball Sheehan

Xavier University and Harvard University

FUSF Hydrophone Tank Lens Application
Expanding Simulation Research at FUSF Using CIVA Software
Dawn Bordenave



A banner year for **Global Scholars**

The Foundation's Global Scholars Program has had a record year in 2021, supporting:

24 students from

20 institutions across

7 countries

Canada
Cyprus
Italy
Russia
South Korea
United Kingdom
United States

Students in this program paired up with an established researcher in the field of focused ultrasound to conduct laboratory or clinical research for a three-month summer internship. ■

Webinar showcasing **Women in science**

Jackie Brenner—a Foundation intern who reaches hundreds of thousands of young adults using social media channels like TikTok and Discord to teach the basics of science, technology, engineering, and math—used her Discord platform, STEMPotential, to host a two-day webinar series showcasing successful women in STEM.



+600 people from around the world tuned in to the weekend series, which included webinars and panel discussions with graduate students, medical students, and medical doctors. ■

Jackie began interning at the Foundation in 2019, when she examined the effects of anesthesia with focused ultrasound in glioblastoma. She has transitioned that experience into her current internship, where she is researching the bioeffects of microbubbles with ultrasound to induce vascular shutdown, sonodynamic therapy, and other immunotherapy projects under the guidance of Frédéric Padilla, PhD, the Foundation's Director of Applied Physics Research.

 Regulatory approvals and reimbursement “wins” for new clinical applications of focused ultrasound continue around the world.



Reimbursement Highlights



April | In the UK, national government insurance coverage went into effect for focused ultrasound treatment of **essential tremor**.



January | A new Category I CPT® code went into effect for focused ultrasound ablation of **malignant prostate tissue** with EDAP-TMS' Focal One® device, valid for both Medicare and private payer reimbursement in the US.

July | The American Medical Association issued a new Category III CPT® code for histotripsy of the **liver**.

Essential tremor

In May, Aetna became the first national insurance payor in the US to cover focused ultrasound for medication-refractory essential tremor (ET). The treatment earned FDA approval in 2016 and already has nationwide US Medicare coverage.

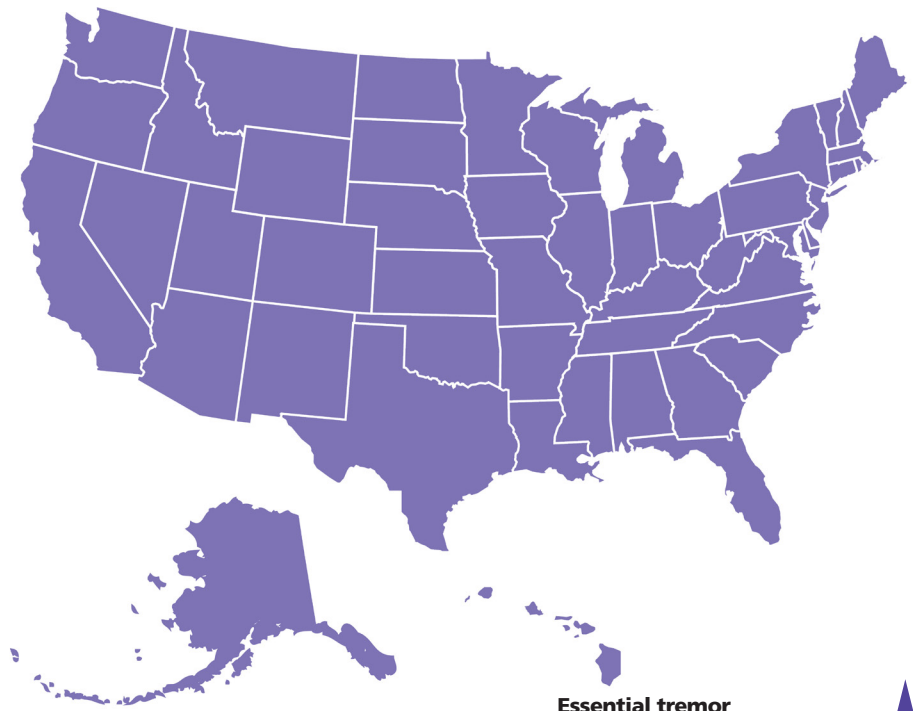
In 2020, manufacturers reported a record 1,540 ET patient treatments across the globe. Reimbursement is a key component in the adoption of focused ultrasound as a standard of care. ■

+75


More than **75 treatment centers** around the world now offer focused ultrasound for ET.

4,000

Nearly **4,000 patients worldwide** have been treated to date.



Essential tremor

Medicare and Aetna now provide reimbursement in all 50 states and Washington, DC. 

patient spotlight

Tom's story Essential tremor

Tom Donegan comes from a “proud Irish Catholic family” of 11 children—eight of whom have essential tremor (ET). While he first started noticing symptoms in his late 20s, Tom was not officially diagnosed with ET until age 55, when he could no longer even write his name.

In September 2019, Tom underwent focused ultrasound treatment on his left (dominant) side at the University of Maryland Medical Center. A year later, he was thrilled to have a second procedure to address the tremor in his non-dominant hand as part of a new ET

clinical trial assessing bilateral (both sides) focused ultrasound treatment.

Today, Tom says, “I feel like I have my life back. It’s tremendous. Neither of my hands shake anymore. And I don’t have to take any medication—at all. I’m hopeful that all my brothers and sisters can benefit from this too.”

Tom’s brother Phil was successfully treated with focused ultrasound on just his dominant side in March 2020 at the West Virginia University Rockefeller Neuroscience Institute. He received a second treatment in spring of 2021 on his nondominant side at the University of Maryland. and he too Phil says,



“It’s been a game-changer and a life-saver. It’s the answer.”

Focused ultrasound for essential tremor is now covered by Medicare in all 50 US states. ■

▶ Watch Tom and Phil’s story on the Foundation’s [website](#).

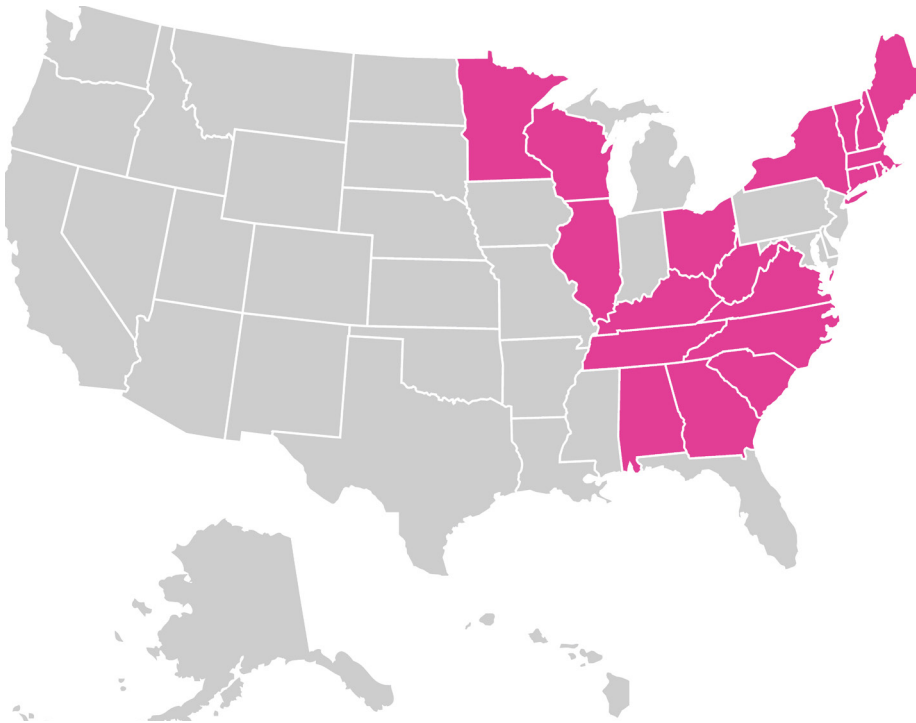
▶ **Geographic expansion of focused ultrasound** is making the treatment available to an ever increasing number of patients around the globe.

19

Reimbursement Expanded

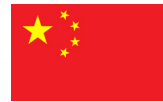
The Centers for Medicare and Medicaid Services announced in March expanded coverage for patients undergoing focused ultrasound treatment for tremor-dominant **Parkinson's disease** (TDPD). The decision means that

Medicare patients in Kentucky, Ohio, and 10 states in the Northeast now have access to focused ultrasound therapy for TDPD; a total of 19 states have announced coverage for the treatment under Medicare. ■



▶ **Parkinson's disease** reimbursement is now available in 19 states.

Regulatory Highlights



February | Insightec received approval in China for treatment of **essential tremor** and **Parkinson's disease, tremor**.



May | Profound Medical received the CE Mark in 33 European countries for treatment of **desmoid tumors**.



May | Insightec received approval in Singapore for treatment of **essential tremor** and **Parkinson's disease, tremor**.

aggregating & sharing knowledge ◀

▶ **Webinars and publications communicate** the latest news on focused ultrasound for a broad range of audiences, from clinicians and industry to patients and donors.

Webinars Educate thousands

Virtual meetings and webinars continued to serve as an optimal vehicle for sharing information in the first half of 2021. The Foundation's webinar series covered a wide variety of topics from neuroethics to advancing women in the field. ■

- "Picture a Scientist" Panel Discussion with Women in Focused Ultrasound
- Focused Ultrasound for Pediatrics
- Neuroethics for Novel Neurotechnologies
- Focused Ultrasound for Cancer Immunotherapy
- Noninvasive HIFU Treatment of Varicose Veins: European Experience and US Market Perspective



2021 State of the Field Report available

The *2021 State of the Field Report* documents the progress that is only possible through the hard work, time, and resources of everyone in our community.

New this year: an in-depth analysis of all research areas; the cumulative number of mechanisms of action by indication and stage of research; and a detailed look at industry trends, regulatory approvals, and investments in the field. ■



The *2021 State of the Field Report* available on the Foundation's website.

▼ Highlights

Distinct indications	152	Indications with regulatory approvals	34
New indications	11	Insured for bone metastases in US	120m
New indications in clinical trials	6	Eligible patients in the US	302.4m
Commercial treatment sites	799	Clinical device manufacturers	54
Clinical research sites	235	FUS industry investment	\$326m
Veterinary program sites	6	New FUS industry companies	6
Centers of Excellence	10	Companies with regulatory approvals	15

Foundation Chairman reaches thousands and shares the promise of focused ultrasound treatment across multiple virtual platforms.



1 Podcast

In a interview on Health Professional Radio in June, Foundation chairman Neal F. Kassell, MD, talked with host Neal Howard about the massive potential of focused ultrasound and the current state of research and treatment for the technology around the globe.

Listen on SoundCloud or YouTube to hear about the promise of focused ultrasound therapy for a wide range of conditions. ■

2 Blog


In a popular post published in the Foundation's newsletter in May, "Driving Focused Ultrasound into the Mainstream," Dr. Kassell shared the five elements needed to transform the Foundation's vision into a reality and establish focused ultrasound as a mainstream standard of care accessible and utilized globally:

-  1 evidence
-  2 awareness
-  3 capital
-  4 partners
-  5 businesses

3 Virtual presentation

Dr. Kassell also shared current news about the Foundation and the potential of focused ultrasound at a Member-Led Forum at the Economic Club of Washington, DC (ECW), in April. According to ECW, these "topic-driven, member-only, and off-the-record" virtual forums are designed to discuss "important issues of the day." As a result of connections made during the presentation, the Foundation was also proud to participate in the ECW's summer internship program, which—in partnership with Urban Alliance—allows scholars to gain real life work experience, professional development, and financial support to offset college expenses. ■



 Read the full report on the Foundation's website

Focus Feature Parkinson's disease

The Foundation's latest Focus Feature, "Focused Ultrasound and Parkinson's Disease," was released in April during Parkinson's Awareness Month, documenting the important progress that has been made in the field of focused ultrasound for the treatment

of Parkinson's (PD). Focused ultrasound is currently approved in the US and Europe for treatment of tremor-dominated PD. This special report—and much more about focused ultrasound for PD—can be found on our website. ■

patient spotlight

Rich's story Parkinson's disease

Rich Nagy was on a motorcycle camping trip in 2017 when he first began experiencing the symptoms of Parkinson's disease (PD). Over time his symptoms worsened, and he was eventually diagnosed with PD by a neurologist in his hometown of Gilbertsville, Pennsylvania.

Rich poured himself into researching the pros and cons of the various treatment options. He eventually connected with Dr. Jeff Elias at the University of Virginia in Charlottesville and was treated there

with focused ultrasound in October 2020. "After only the third sonication, I already had no involuntary motion in my hand at all! I was just astonished that my tremor had stopped."

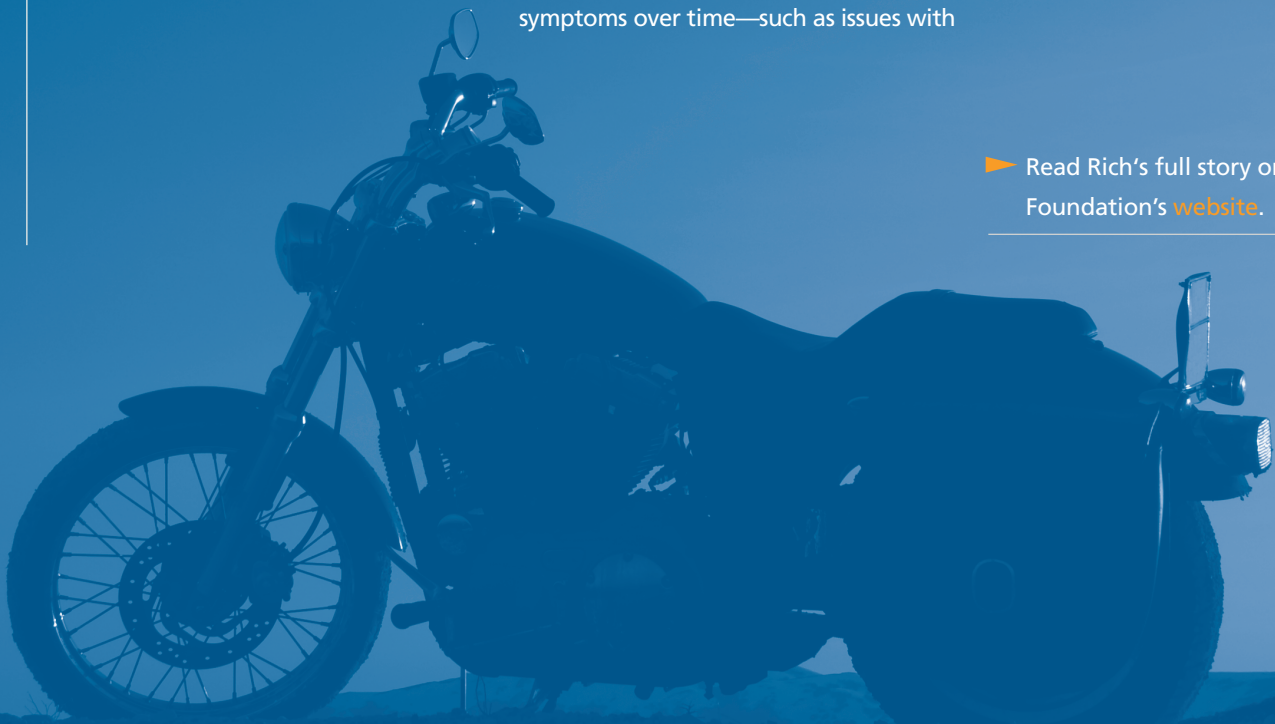
He also noticed that the tension and nervousness often associated with PD was immediately gone: "It was the first time in several years that I actually felt normal."

Nearly a year since his treatment, Rich does not need any medications to help with movement issues. And despite noting the return of some mild symptoms over time—such as issues with



balance—which he assumes is due to disease progression, Rich says, "For me, focused ultrasound was a wonderful decision. I have absolutely no regrets, and I encourage anyone who might be considering the treatment to pursue it whole-heartedly." ■

▶ Read Rich's full story on the Foundation's [website](#).



building momentum in Asia ◀

▶ **Medical therapy revolutionization in Asia** is occurring due to the rapidly growing field of focused ultrasound, made possible through the ambition, time, and resources of the global focused ultrasound community.



Focused Ultrasound Hong Kong Foundation

The Foundation created a Hong Kong subsidiary, Focused Ultrasound Hong Kong Foundation (FUSHK), through which funds are already being received from Hong Kong and Asia-based philanthropists to be distributed to research institutions in Asia. FUSHK will officially launch in 2022. ■

Asia by the Numbers

Asia leads the world in commercial treatment sites

318

of the 799 total sites are located there.

66

new FUS commercial treatment sites have been identified in 2020.

Regulatory approvals and reimbursement in the region

29

indications have been approved for treatment with focused ultrasound.

9

Countries in Asia provide reimbursement for a total of **7 indications**:

- Benign prostatic hyperplasia
- Bone metastases
- Essential tremor
- Neuropathic pain
- Parkinson's disease, tremor dominant
- Prostate cancer
- Uterine fibroids
- Major depressive disorder
- Alzheimer's disease

building momentum in Asia

 The region leads global regulatory approvals with 28 of 32 occurring in Asia last year, most of which were in Hong Kong and Thailand.

New Approvals **28**

China | NMPA



Benign prostatic hyperplasia
Prostate cancer

Kazakhstan | NCEM



Essential tremor
Neuropathic pain
Parkinson's disease, tremor

Japan | MHLW



Parkinson's disease, dyskinesia
Parkinson's disease, tremor

Taiwan | FDA



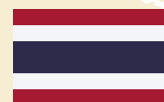
Prostate cancer

Hong Kong | MDD



Arthritis, facetogenic
Bone cancer
Bone metastases
Bone tumors, benign
Essential tremor
Multiple myeloma
Neuropathic pain
Parkinson's disease, tremor
Uterine adenomyosis
Uterine fibroids

Thailand | FDA



Arthritis, facetogenic
Bone cancer
Bone metastases
Bone tumors, benign
Essential tremor
Multiple myeloma
Neuropathic pain
Parkinson's disease, tremor
Prostate cancer
Uterine adenomyosis

 Clinicians, advisors, and manufacturers in Asia have become critical partners to the Foundation.

Our ambassadors in Asia

The Focused Ultrasound Foundation has valuable assets on the ground in Asia connecting with manufacturers, industry partners, researchers, and scientists in order to further expand the global reach of focused ultrasound.



Dong-Guk Paeng, PhD, serves as an ambassador of the Foundation in Asia, cultivating relationships with laboratory and clinical research sites, commercial treatment sites, and manufacturers throughout the region. ■



Jessica Che-yi Chao is Chief Advisor of Asia who builds and strengthens connections with Asia-based philanthropists, investors, manufacturers, and partners. She is also a member of the Foundation's Council. ■

Companies Spotlight

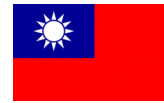


Neurosona is a Korean focused ultrasound company that aims to develop the technology for brain treatments, including neuromodulation. Their low-intensity focused ultrasound platform has already been used for several pilot clinical trials, including the treatment of major depressive disorder and Alzheimer's disease. ■



Shanghai A&S Science Technology Development

has manufactured and marketed diagnostic and therapeutic ultrasound devices in China and internationally for more than 20 years. Its tumor ablation device, HIFUNIT9000, is used to treat uterine fibroids and various cancers. ■



NaviFUS has designed and manufactured neuronavigation and ultrasound-guided focused ultrasound systems for the treatment of brain diseases and disorders in Taiwan since 2015. Their three current devices are being used in clinical trials for brain tumors, epilepsy, and soon, Alzheimer's disease. Biomechanisms in development include blood-brain barrier opening and neuromodulation. ■



IMage Guided Therapy—

also known as IMGT Co., LTD—is a Korean company that is developing a nanotechnology-based gene and drug delivery system. The system uses ultrasound-guided focused ultrasound to provide enhanced immunotherapy solutions. Their portable focused ultrasound device is designed to target desired treatment areas that contain malignant tumors, such as breast cancer, sarcoma, and thyroid cancer. ■



“ I first heard of focused ultrasound when I attended a speech by Neal Kassell, MD, at an event in Hong Kong. I was immediately struck by this innovative alternative to the trauma of more conventional treatments. I am happy to support the Focused Ultrasound Hong Kong Foundation’s efforts in the hopes that this treatment becomes widely accepted treatment in Asia.”

— Alasdair Morrison
Focused Ultrasound Hong Kong
Foundation donor



FUS + drug delivery **Pancreatic cancer**

Clinicians at Seoul National University Hospital in Korea are using low power (mechanical) effects of focused ultrasound to treat pancreatic cancer lesions to try to enhance the effectiveness of the anti-cancer FOLFIRINOX regimen. The hope is that the treatment will help disrupt the dense tumor stroma to allow better penetration and effectiveness of the drugs. ■



▶ Advancing focused ultrasound worldwide and increasing awareness in the clinic is aided by the addition of new Senior Advisors.



Foundation announces new Senior Advisors

Alan H. Matsumoto, MD, MA, joined the Foundation as a Senior Advisor for Medical Imaging and Image-Guided Therapeutics. He provides input on research projects and represent the Foundation at scientific and medical meetings. An expert in his specialty, Dr. Matsumoto has been on faculty at the University of Virginia (UVA) since 1991, where he is currently Chair and Theodore E. Keats Professor of Radiology in the Department of Radiology and Medical Imaging. He is also Medical Director of UVA's Focused Ultrasound Center, which was named the Foundation's first Focused Ultrasound Center of Excellence in 2009.

“ I look forward to this opportunity to help advance the science and clinical application of this cutting-edge technology which is being used to deliver novel and life-changing therapies to patients.”-

— Alan Matsumoto

“ Clinical trials and research support by the Foundation and others should accelerate the application of revolutionary focused ultrasound-based therapeutic options for brain tumor patients. I am delighted to help in the neuro-oncology efforts of the Foundation team.”

— Jason Sheehan

Jason Sheehan, MD, PhD, joined the Foundation as a Senior Advisor for Brain Tumor Research. In this role he is helping to define the Foundation's overall strategy for brain tumor research, as well as engaging in Foundation-initiated laboratory and clinical research, interfacing with medical societies, and assisting in organizing collaborative workshops. He is the Harrison Distinguished Chair of Neurosurgery and Professor of Neurological Surgery, Radiation Oncology, Biomedical Engineering, and Neuroscience at UVA. ■

Above, top to bottom
Alan H. Matsumoto, Jason Sheehan

Four new members Join Council

The Foundation's Council—a group of passionate, enthusiastic advocates who connect the Foundation to the greater community—added four new members this year.

“**Focused ultrasound shows great promise for improving patients' lives, and I am particularly committed to technologies that may transform treatment for multiple cancers.**”

— Bob Hugin
Former Chairman and CEO
Celgene Corporation

“**I first learned about focused ultrasound several years ago, and I continue to be amazed by its wide variety of mechanisms and potential applications.**”

— Carolyn Yeh
Vice President
Yale Club Hong Kong

Above middle, top to bottom
Bob Hugin, Mark Onetto

Above right, top to bottom
Mary Lou Jepsen, Carolyn Yeh



“**Focused ultrasound shows tremendous promise to be a revolutionary therapeutic technology for human and veterinary medicine. I am delighted to be a part of this remarkable community that is committed to improving millions of lives.**”

— Mark Onetto
Retired Senior Vice President
Amazon.com, Inc.

“**I'm dazzled by the potential of focused ultrasound to treat a massive number of human conditions, but I am even more amazed at the speed of execution in making these dreams reality.**”

— Mary Lou Jepsen, PhD
CEO, Founder, and Chair of the Board
Openwater

Board

Neal F. Kassell, MD
Chairman, Focused Ultrasound Foundation
Former Co-chair of Neurosurgery,
University of Virginia

Scott Beardsley, PhD
Dean, University of Virginia Darden
School of Business

Eugene V. Fife
Founding Principal, Vawter Capital, LLC
Former Chairman,
Goldman Sachs International

John R. Grisham
Author

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Senior Advisor, EW Healthcare Partners
Retired Chairman & CEO, Medtronic

Daniel P. Jordan, PhD
President Emeritus,
Thomas Jefferson Foundation

Syaru Shirley Lin, PhD
Adjunct Professor,
Chinese University of Hong Kong
Director, Goldman Sachs Asia Bank

Michael R. Lincoln
Global Business Department Chair,
Cooley LLP

Michael Milken
Chairman, Milken Institute

Edward D. Miller, MD
Former CEO, Johns Hopkins Medicine

Frederic H. Moll, MD
Chief Development Officer, Johnson &
Johnson Medical Devices Companies
Co-founder, Auris Health, Inc.

Charles "Wick" Moorman IV
Former Chairman & CEO, Norfolk Southern
Former CEO, Amtrak

Steve H. Rusckowski
Chairman, President, and CEO,
Quest Diagnostics Inc.
Former CEO, Philips Healthcare

Gary Shapiro
President & CEO, Consumer Technology
Association (CTA)[®]

Carl P. Zeithaml, PhD
Dean and F. S. Cornell Professor of
Free Enterprise, McIntire School
of Commerce, University of Virginia

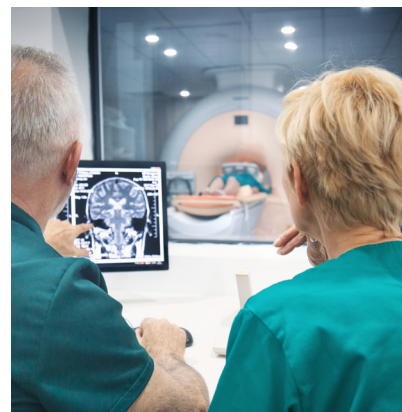
Council

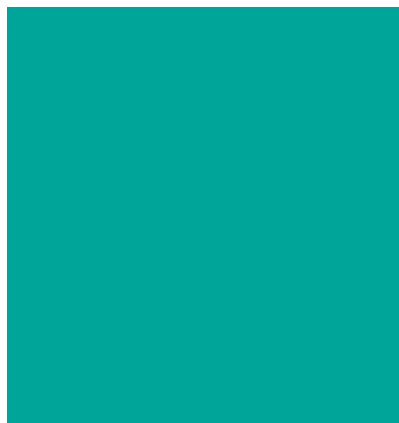
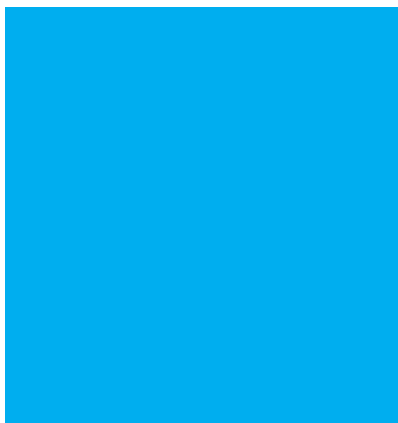
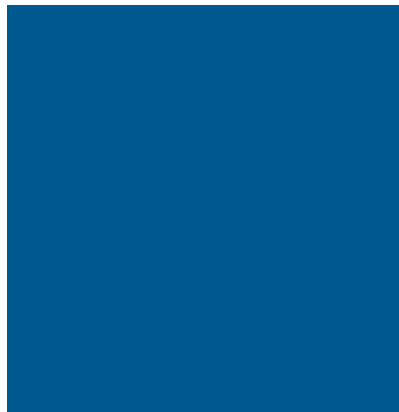
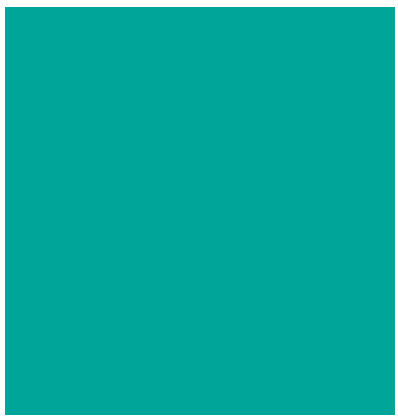
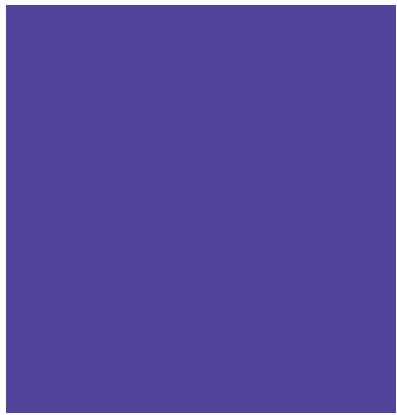
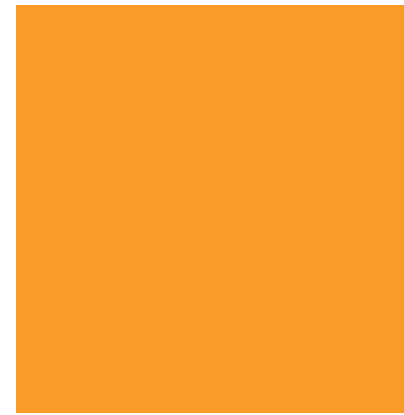
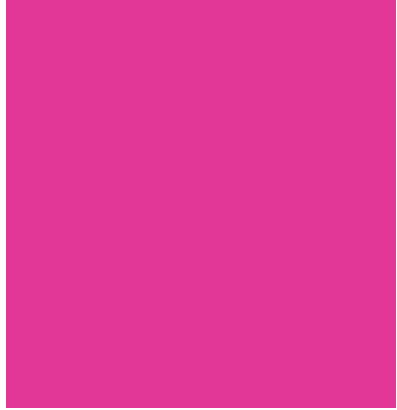
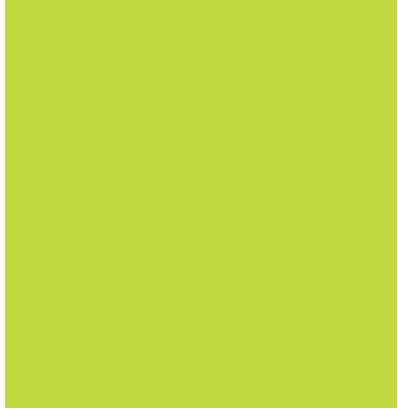
Co-chairs

Jane P. Batten
Charles H. Seilheimer, Jr.

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John B. Adams, Jr.
Dorothy N. Batten
Ellen Block
Amanda Brown
Deborah Caldwell
Jessica Che-yi Chao
**Nancy J. &
Thomas N. Chewning**
Marguerite & Norwood Davis
Peter Gabriel
David Goode
Rick Hamilton
Alice Handy
Diane Heller
Robert J. Hugin
Kat Imhoff
Mary Lou Jepsen, PhD
Dean L. Kamen
Ann Kingston
Harry Lester
Jonna Mendez
Jane Metcalfe
Paula F. Newcomb
Marc Onetto
Mary Lou Seilheimer
Alice H. Siegel
Allan C. Stam, PhD
Fredi & Howard Stevenson
Bernice Szeto
Andrew C. von Eschenbach, MD
Claude Wasserstein
Carolyn Yeh







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