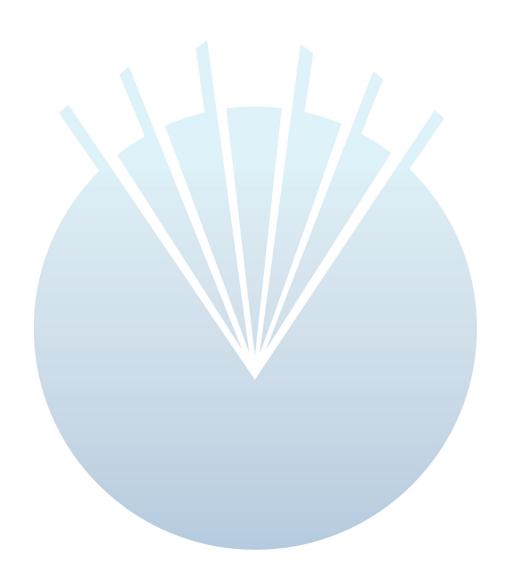
# Focused Ultrasound State of the Field 2017







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The Focused Ultrasound Foundation strives to provide the most accurate information possible and, therefore works proactively with the manufactures and research sites to collect the most current data available in advance of the release of this publication. The Focused Ultrasound Foundation assumes no responsibility for any errors or omissions as every precaution has been taken to verify the accuracy of the information contained herein. No liability is assumed for damages that may result from the use of information contained within. If you note something out of date or inaccurate, please submit the new information/updates to: engagement@fusfoundation.org

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#### **Dear Friends,**

The Focused Ultrasound Foundation was established with the vision that this groundbreaking, noninvasive, therapeutic technology would improve the quality of life and decrease the cost of care for millions of patients around the world.

2016 was our most successful year, and as a result we see this vision coming closer to reality. The dialogue has shifted from if focused ultrasound can become a mainstream standard of care to when it will.

The entire focused ultrasound ecosystem, from researchers to manufacturers and treatment sites, continues to grow at an accelerating pace.

The number and diversity of mechanisms by which focused ultrasound affects tissue are expanding, creating the possibility to treat an even wider variety of medical disorders. Indications currently in research, development, and commercialization have skyrocketed to more than 75 from just a handful a decade ago. The numbers of research sites, investigators, regulatory approvals, commercial treatment sites, and patients treated all show impressive growth.

As this momentum builds, the field continues to transition from the research stage to commercialization of the technology. Several years ago there were no organizations providing industry marketing reports on focused ultrasound; today there are 23, a powerful indication of the field's expansion.

The 2017 State of the Field includes new charts, graphs, and timelines not in previous versions of the report. These additions present a longitudinal view of how the field of focused ultrasound has grown and changed over time, further demonstrating its impressive trajectory.

The Foundation has served as a catalyst, driving growth and advancing the field of focused ultrasound for more than a decade. We are now in the enviable position of needing to further prioritize activities to address mission-critical bottlenecks and leverage resources to provide unique value and measurable impact.

In the coming year, the Foundation will continue to move focused ultrasound beyond the tipping point and accelerate development and adoption. Success will require increased awareness, further funding for research and development, and investment in commercial organizations. We will play an active role in all of these areas to provide resources; connect, convene and influence stakeholders; and foster collaboration.

The revolution continues. Thank you for your continued support and for playing a pivotal role in decreasing death, disability, and suffering for countless people.

Be well,

Neal F. Kassell, MD

/hornel

Chairman

#### The Technology

Focused ultrasound is an early-stage, disruptive, noninvasive therapeutic technology that has the potential to improve the lives of millions of patients with a variety of serious medical disorders by providing an alternative or complement to surgery, radiation therapy, drug delivery, and cancer immunotherapy.

This game-changing technology has the potential to increase the quality and longevity of life and decrease the cost of care by transforming the treatment of a range of conditions, including tumors of the brain, breast, prostate, liver and pancreas; Parkinson's and Alzheimer's disease and epilepsy; depression and obsessive compulsive disorder; and arthritis and hypertension. With further technology development, laboratory research, and clinical trials, focused ultrasound could be as revolutionary to therapy as MR scanning has been to diagnosis.

Focused ultrasound treats tissue with multiple intersecting beams of high-frequency sound focused accurately on targets deep in the body without damaging surrounding structures, much as beams of light can be focused on a point with a magnifying glass. At the focal point where the beams converge, the ultrasound energy induces a variety of biological effects including destroying tissue, delivering drugs in high concentrations, enhancing radiation therapy, and stimulating the immune response. The multiple biological effects create the possibility to treat a wide range of disorders. Magnetic resonance or ultrasound imaging is used to identify the targets and guide and control the treatment in real time.

#### The Problem

Unfortunately, it can take decades for a new therapeutic technology like focused ultrasound to become mainstream. Every year shaved off that process could reduce death, disability, and suffering for countless people.

Saving Time = Saving Lives

#### The Focused Ultrasound Foundation

The Foundation is a unique medical research, education, and advocacy organization created as the catalyst to accelerate the development and adoption of focused ultrasound. The Foundation is a tax-exempt 501(c)(3) corporation started in 2006.

To achieve its goals, the Foundation utilizes an approach that is entrepreneurial, high impact, high performance, market driven, and results oriented.

We advance the field by identifying and leveraging opportunities and overcoming barriers, thereby shortening the time from laboratory research to widespread patient treatment as a standard of care.

#### Major initiatives include:

- Influencing the direction of the field, identifying priorities, and defining areas of clinical benefit
- Fostering collaboration and stimulating innovation
- Providing resources, both financial and human capital
- Creating knowledge by organizing, conducting, and funding research
- Overcoming barriers, including regulatory and reimbursement challenges
- Cultivating the next generation of clinicians and scientists by supporting internships and fellowships
- Convening the community through meetings, symposia, and workshops
- Increasing awareness through events and media outreach
- Aggregating and sharing knowledge through our website, newsletter, social media, webinars, and open-source journal

This work is made possible by the philanthropic support of our donors, who recognize the urgent needs of patients, the potential of focused ultrasound, and the value of the Foundation's disciplined, entrepreneurial approach.

# STATE OF THE FIELD

# State of Research and Regulatory Approval by Indications

Development stage:	Conceptual	Pre-clinical Anecdotal	Pilot Trials Pivotal Trials	Outside US Approvals FDA App	rovals US Reimbursemen
Cardiovascula <b>r</b>		Neurological		Pain	
Hypertension		Essential tremor		Back pain, facetogenic	
Peripheral artery disease		Depression		Neuropathic pain	
Arteriovenous malformations		Neuropathic pain		Osteoid osteoma	
Atherosclerosis		Obsessive-compulsive		Back pain, sacroiliitis	
Atrial fibrillation		disorder		Painful amputation stump	
Cardiac dysrythmias		Parkinson's disease		neuromas	
Congestive heart failure		Amyotrophic lateral scleros		Cancer pain	
Deep vein thrombosis		Alzheimer's disease			
Hypoplastic left heart		Brain cancer			
syndrome		Brain tumors, benign		Pediatrics	
Septal perforation		Dystonia		Osteoid osteoma	
ooptal portoration		Epilepsy		Soft tissue tumors, benign	
		Painful amputation stump		Brain tumors, benign	
Endocrine Disorders		neuromas		Arteriovenous malformations	
Thyroid nodules		Trigeminal neuralgia		Neuroblastoma, pediatric	
Thyroid cancer		Hydrocephalus			
Diabetes		Stroke			
Obesity		Traumatic brain injury		Pulmonary	
		Multiple sclerosis	_	Lung metastases	
		<u> </u>		Lung cancer	
Gastrointestinal		0			
Liver cancer		Oncological		Urological	
Pancreatic cancer		Bone metastases			
Malignant obstructive jaundice		Prostate cancer*		Benign prostatic hyperplasia*	
Colorectal cancer		Breast cancer		Prostate cancer*	
Esophageal cancer		Kidney cancer		Kidney cancer	
		Liver cancer		Kidney stones Acute kidney injury	
Miscellaneous		Pancreatic cancer Soft tissue cancer		Acute kidney injury  Acute tubular necrosis	
Soft tissue cancer		Bone cancer		Bladder cancer	
Soft tissue tumors, benign		Brain cancer		Ureterocele	
Head & neck cancer		Head & neck cancer		<u>Oleteroceie</u>	
Hypersplenism		Melanoma			
Melanoma		Thyroid cancer		Women's Health	
Weignoria		Cervical cancer		Uterine fibroids	
		Lung metastases		Breast cancer	
Musculoskeletal		Neuroblastoma, pediatric		Breast fibroadenoma	
Bone metastases				Uterine adenomyosis	
Back pain, facetogenic		Cancer pain		Tubal pregnancy	
Osteoid osteoma		Colorectal cancer		Cervical cancer	
		Esophageal cancer		Fetal surgery**	
				Retained placenta accreta	
Back pain, sacroiliitis		Lung cancer		p.aooiita aooiota	
Back pain, sacroiliitis Bone cancer		Lung cancer Ovarian cancer		Ovarian cancer	
Back pain, sacroiliitis Bone cancer Bone tumors, benign		Ovarian cancer		Ovarian cancer Polycystic ovary syndrome	
Back pain, sacroiliitis Bone cancer Bone tumors, benign Osteoarthritis				Ovarian cancer Polycystic ovary syndrome	<b>&gt;&gt;</b>
Back pain, sacroiliitis Bone cancer Bone tumors, benign					

 $<sup>\</sup>ensuremath{^{\star}}$  FDA approval is for prostate tissue ablation.

<sup>\*\*</sup> Fetal surgery includes twin-twin transfusion syndrome, fetal bladder obstruction, and a range of congenital heart abnormalities.

#### 2017 Global Development Landscape

Conceptual Pre-clinical	Anedotal	Pilot Trials	Pivotal Trails	Outside US Approva	S FDA Approvals	US Reimbursemen
Acute kidney injury Acute tubular necrosis Atherosclerosis Atrial fibrillation Bladder cancer Bone metastases Cancer pain Cardiac dysrythmias Colorectal cancer Congestive heart failure Deep vein thrombosis Diabetes Disc degeneration Esophageal cancer Hydrocephalus Hypoplastic left heart syndrome Lung cancer Muscle atrophy Obesity Ovarian cancer Polycystic ovary syndrome Septal perforation Spinal cord injury Stroke Traumatic brain injury Ureterocele		Amyotrophic lateral sclerosis Alzheimer's disease Back pain, sacroillitis Bone cancer Bone tumors, benign Brain cancer Brain tumors, benign Dystonia Epilepsy Head & neck cancer Hypersplenism Kidney stones Malignant obstructive jaundice Melanoma Painful amputation stump neuromas Peripheral artery disease Osteoarthritis Thyroid cancer Tubal Pregnancy		Back pain, facetogenic Bone metastases Benign prostatic hyperplasia Breast cancer Breast fibroadenoma Depression Essential tremor Glaucoma Hypertension Kidney cancer Liver cancer Neuropathic pain Obsessive-compulsive disorder Osteoid osteoma Pancreatic cancer Parkinson's disease Prostate cancer Soft tissue cancer Soft tissue tumors, benign Thyroid nodules Uterine adenomyosis Uterine fibroids	Benign prostatic hyperplasia* Bone metastases Essential tremor Prostate cancer* Uterine fibroids	Bone metastases

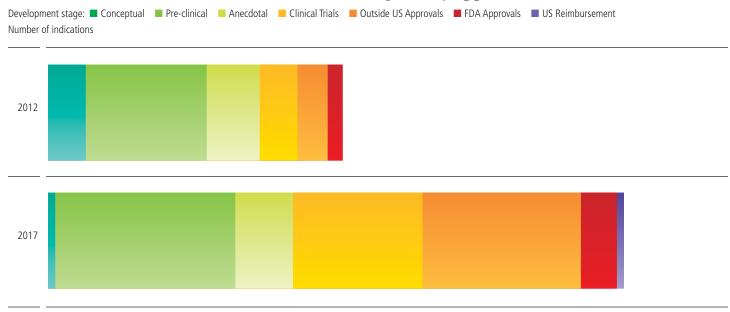
<sup>\*</sup> FDA approval is for prostate tissue ablation.

Early research stages tend to have lower costs and shorter timelines as compared to clinical trials. The significant increase in both expense and time is largely due to increased regulatory requirements that are necessary to ensure patient safety during new medical device evaluation.

<sup>\*\*</sup> Fetal surgery includes twin-twin transfusion syndrome, fetal bladder obstruction, and a range of congenital heart abnormalities.

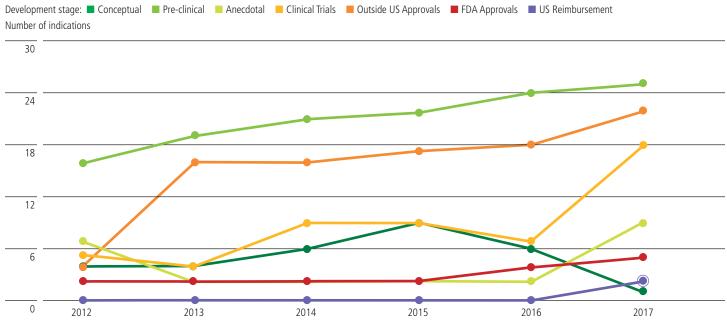
# STATE OF THE FIELD

The number of indications has doubled in the last five years with an overall shift toward clinical work and regulatory approval.



Indications that have Outside US Approvals, FDA Approval and US Reimbursement are repeated in each category. There are 75 unique indications.

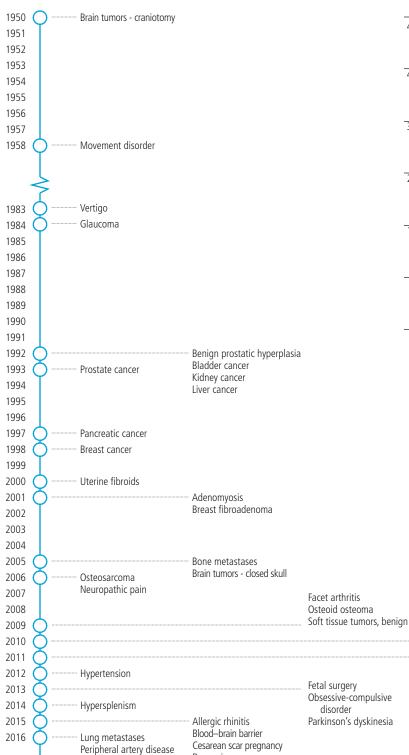
The number of pre-clinical indications and outside US approvals has steadily grown over the past five years. In 2016, US reimbursement was achieved for the first time.



Indications that have Outside US Approvals, FDA Approval and US Reimbursement are repeated in each category. There are 75 unique indications.

### First in Human Treatments Timeline

Clinical trials or commercial treatments

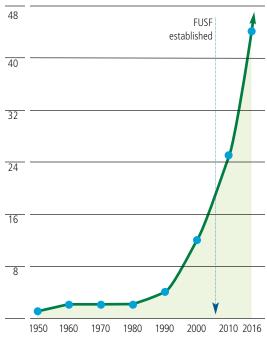


Depression

Sacral chordoma

# New FUS Indications by Decade

Clinical trials or commercial treatments



Osteoarthritis

Thyroid cancer

Parathyroid cancer

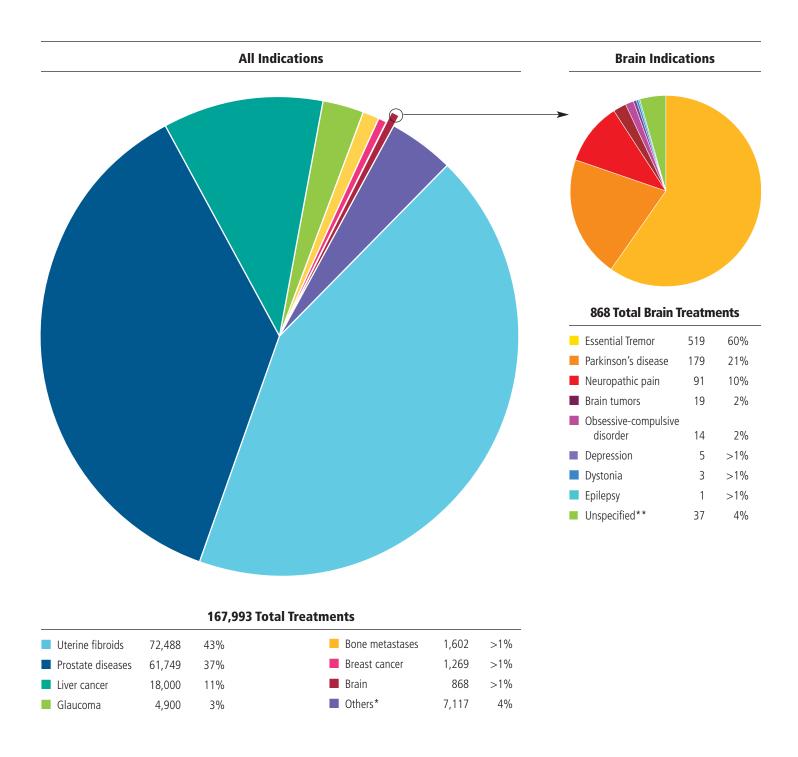
Essential tremor

Tubal pregnancy

Parkinsonian tremor

## STATE OF THE FIELD

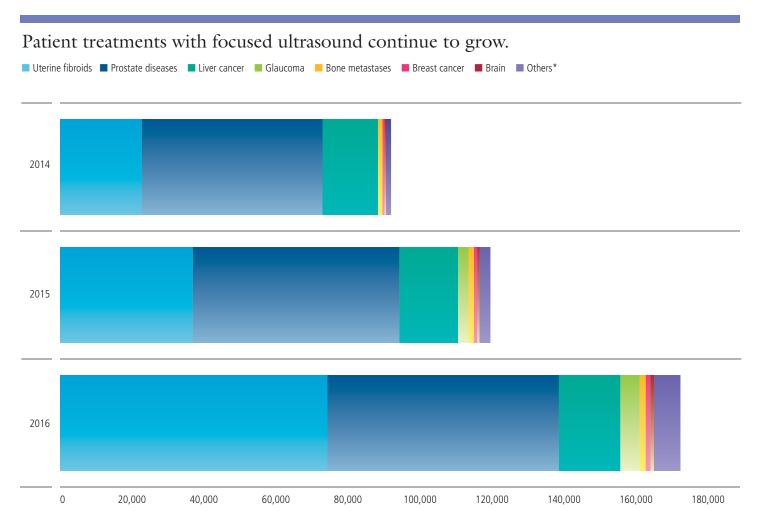
Prostate diseases and uterine fibroids comprise 80% of all treatments.



Manufacturer supplied data. The number of patient treatments reported is lower than the actual number of procedures because of incomplete reporting from manufacturers and treatment sites.

<sup>\*</sup> Back pain, facetogenic; bone cancer; colorectal cancer; kidney cancer; muscular dystrophy; osteoarthritis; osteoid osteoma; pancreatic cancer; soft tissue cancer; thyroid nodules

<sup>\*\*</sup>Not all manufacturers are recording specific indications for brain. The Foundation is working to clarify this for 2018.

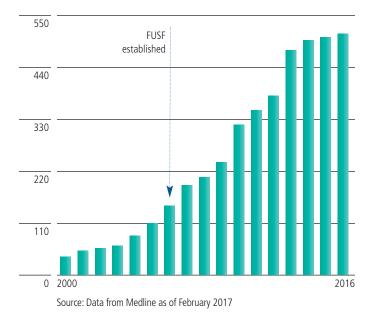


<sup>\*</sup>Back pain, facetogenic; bone cancer; colorectal cancer; kidney cancer; muscular dystrophy; osteoarthritis; osteoid osteoma; pancreatic cancer; aoft tissue cancer; thyroid nodules

# STATE OF THE FIELD

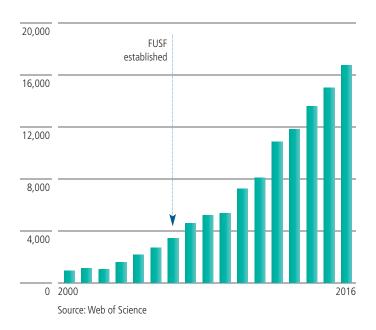
#### **FUS Publications**

Per year



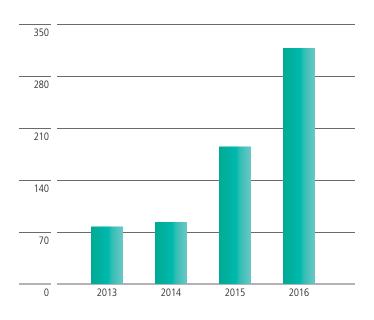
#### **FUS** Citations

Per year



#### FUS Media Placements in the US

Per year

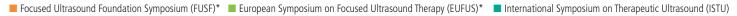


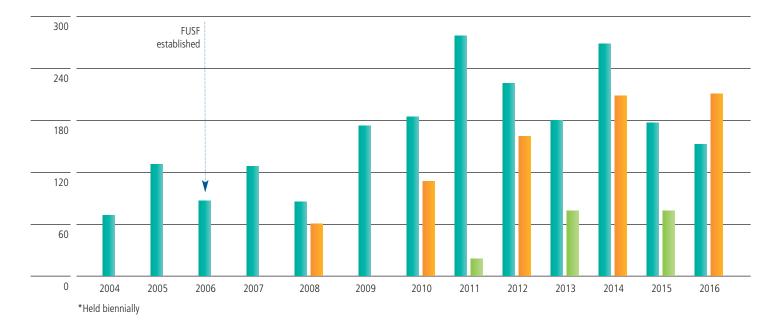
#### Total Awards for All FUS NIH Research Grants

Dollars in millions



#### Abstracts Presented at FUS Symposia





#### FUS symposia abstracts continue to trend upwards.

The well-established ISTU symposium attracts FUS researchers annually. With the addition of the FUSF and EUFUS symposia in the past decade, there has been an overall increase in the total number of FUS abstracts presented year on year. (See above.)

# FUS publications and citations continue trend upwards.

After a steady yearly increase in the number of publications, the trend has tapered slightly over the past four years, despite the continually increasing number of global research sites (see page 16). This slowing trend of publications could be a reflection of the number of indications that have progressed from the pre-clinical phase to the clinical phase of the research cycle. The timeline for a clinical study is significantly longer in duration and, therefore, the availability of data to publish isn't as frequent. Conversely, the number of citations to FUS research continues to increase year on year.

#### FUS media placement at an all-time high.

Media placements have more than quadrupled in the past two years. Additionally, placements in more mainstream media venues have increased. Both the FDA approval of essential tremor treatment and John Grisham's *The Tumor* have helped expand awareness for FUS technology beyond the scientific community in the past two years.

# Approval of NIH research grants continues at a steady upward pace.

In spite of recent and proposed future NIH funding cuts, focused ultrasound research projects continue to be approved for NIH sponsored grants. Over the past decade, the number of NIH grants has fluctuated year to year but the overall trend is a steady increase since the inception of the FUS Foundation.

## STATE OF THE FIELD

# FUS Approvals by Region and Manufacturer

	North	America	Euro	pe			Asia			S. America
Medical Condition	US FDA	Canada Health Canada	Europe CE Mark	Russia Roszdravnadzor	China CFDA	India cdsco	Japan мнгw	Korea MFDS	Mid East	
Cardiovascular										
Hypertension			*							
Endocrine										
Thyroid nodules			*							
Miscellaneous										
Soft tissue tumors, benign			*	*	*					*
Musculoskeletal										
Back pain, facetogenic			*							
Osteoid osteoma			**	*	*					*
Neurological										
Depression								*		
Essential tremor	*	*	*	*			*	*	*	
Neuropathic pain			*	*				*	*	
OCD*								*		
Parkinsonian tremor			*	*				*	*	
Oncological										
Bone metastases	*	*	**	**	*	**	*		**	*
Breast cancer			*	**	*			*		*
Kidney cancer			*	*	*					*
Liver cancer			*	*	**			**		*
Pancreatic cancer			*		**			**		*
Prostate diseases	**	**	***	* **		*		*		**
Soft tissue cancer			*	*	*					*
Ophthalmological										
Glaucoma			*							
Women's Health										
Breast fibroadenoma			*					*		
Uterine adenomyosis			**	*	***					*
Uterine fibroids	*	**	***	***	***	**	*	*** ****	**	***

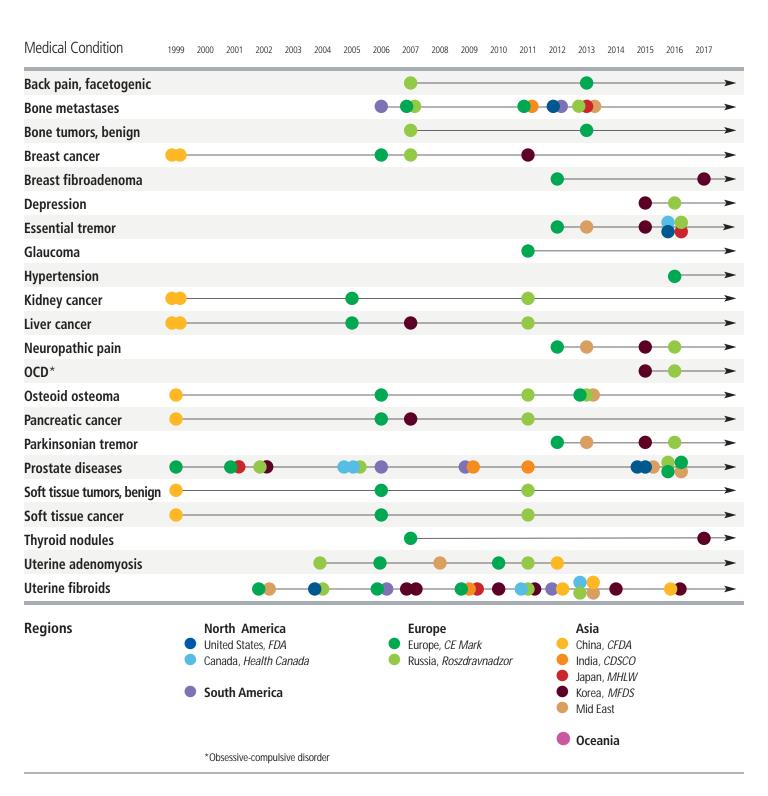
#### **Manufacturers**

- \* Alpinion Medical Systems, Korea
- ★ Beijing Yuande Bio-Medical Engineering, *China*
- ★ Chongqing Haifu Medical Technology Co., LTD, China
- ★ EDAP TMS S.A., France
- ★ EyeTechCare, France

- ★ INSIGHTEC LTD, Israel
- ★ Kona Medical, USA
- ★ Philips Healthcare, The Netherlands
- rofound Medical Inc., Canada
- ★ Shanghai A&S, China

- ★ Shenzhen PRO-HIFU Medical Tech Co., China
- ★ SonaCare Medical, LLC, USA
- ★ Theraclion, France
- Wuxi Haiying Medical, China\*Obsessive-compulsive disorder

## FUS Regulatory Approvals by Indication and Region



#### FUS Manufacturers by Region

■ MR (magnetic resonance) guidance ■ US (ultrasound) guidance ■ MR (magnetic resonance) & US (ultrasound) guidance ■ Transducers ■ Other

# 11

#### **North America**

#### MR GUIDANCE

BrainSonix Sherman Oaks, California

Profound Medical Inc. Toronto, Canada

#### ■ US GUIDANCE

HistoSonics, Inc. Ann Arbor, Michigan

International Cardio Corporation, LLC Minnetonka, Minnesota

Kona Medical Bellevue, Washington

Mirabilis Medical Bothell, Washington

SonaCare Medical, LLC Charlotte, North Carolina

Verasonics Redmond, Washington

- MR & US GUIDANCE FUS Instruments Inc. Toronto, Canada
- TRANSDUCERS
  Sonic Concepts
  Bothell, Washington
- OTHER
  FUS Mobile
  Alpharetta, Georgia

# 12

Europe

#### MR GUIDANCE

Image Guided Therapy (IGT) Pessac, France

INSIGHTEC LTD Tirat Carmel, Israel

Medsonic LTD Limassol, Cyprus

Philips Healthcare
Eindhoven, The Netherlands

#### **US GUIDANCE**

Acublate London, UK

EDAP TMS S.A. Vaulx-en-Velin, France

Theraclion
Malakoff, France

#### MR & US GUIDANCE

Supersonic Imagine Aix-en-Provence, France

#### TRANSDUCERS

Imasonic Voray-sur-l'Ognon, France

OTHER

CarThera Paris, France

EyeTechCare Rillieux-la-Pape, France

Promedica Bioelectronics Rome, Italy

# 12

Asia

## MR GUIDANCE

EpiSonica Hsichu City, Taiwan

#### **US GUIDANCE**

Alpinion Medical Systems Seoul, Korea

Beijing Yuande Bio-Medical Engineering Beijing, China

Mianyang Sonic (SUONIKE) Electronic Mianyang, China

Shenzhen PRO-HIFU Medical Tech. Co., LTD

Shenzhen, China

Shenzhen Wikkon Shenzhen, China

Sumo Corporations Kowloon, Hong Kong

Wuxi Haiying Medical Wuxi China

#### MR & US GUIDANCE

Changjiangyuan Technology Development Co., LTD Shenyang, China

Chongqing Haifu (HIFU) Medical Technology Co., LTD Chongqing, China

Shanghai A&S Co., LTD Shanghai, China

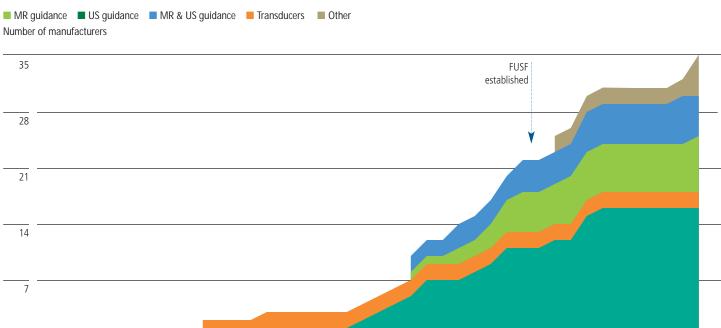
#### OTHER

NaviFUS

New Taipei City, Taiwan

Manufacturer Criteria: Ultrasound technology must be 1) therapeutic 2) non-invasive 3) focused 4) image-guided. Contact info for all manufacturers can be found on page 73.

# The number of FUS manufacturers continues to increase.



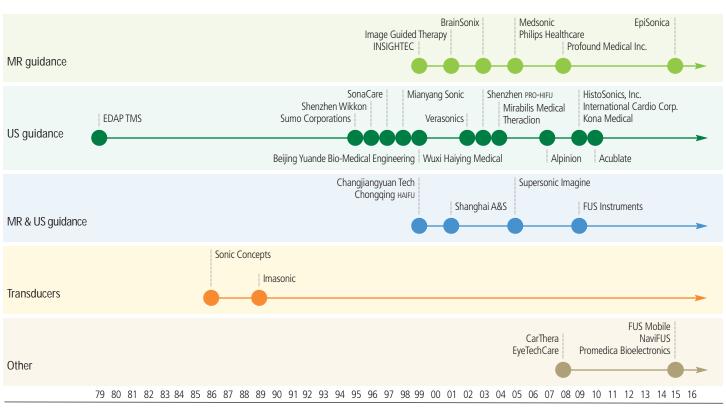
2000

#### Timeline of FUS Manufacturers

Source: Manufacturer supplied data

1979

0

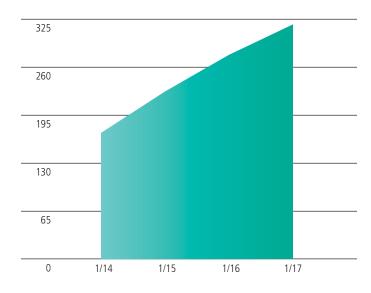


2016

# RESEARCH TRENDS

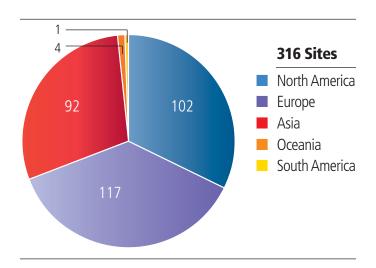
#### Total Research Sites Growth

January 2014 to January 2017



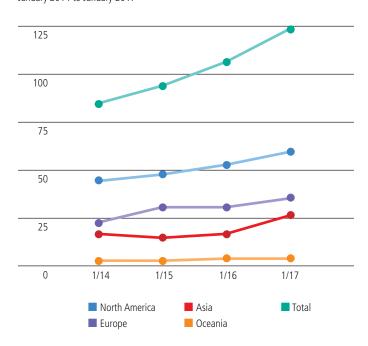
# Total Research Sites by Region

January 2017



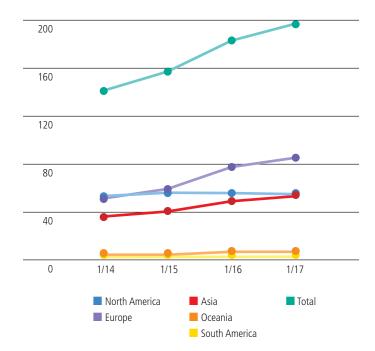
#### Pre-clinical Sites

January 2014 to January 2017



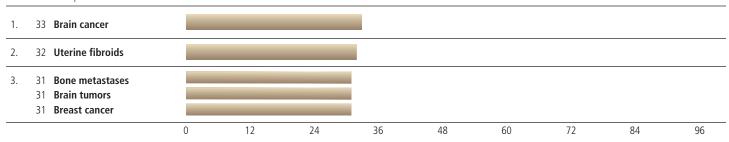
#### Clinical Sites

January 2014 to January 2017

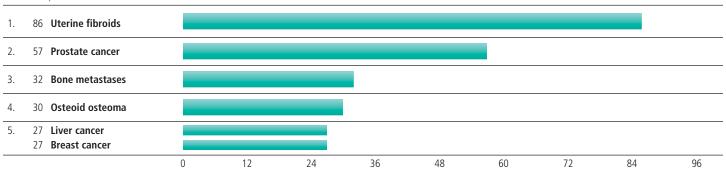


# Leading Indications by Number of Sites

#### Pre-clinical | Number of sites



#### **Clinical** | Number of sites



# Emerging Research Indications by Growth in Number of Sites

#### **Pre-clinical**

	Number	r of Sites	
Indications	2016	2017	% change
Parkinson's disease	6	11	83
Back pain, facetogenic	9	13	44
Osteoid osteoma	8	10	25
Kidney cancer	13	16	23
Brain cancer	27	33	22

#### Clinical

	Numbe	r of Sites	
Indications	2016	2017	% change
Brain cancer	7	10	43
Pancreatic cancer	13	17	31
Back pain, facetogenic	9	11	22
Parkinson's disease	9	11	22
Prostate cancer	52	57	10

# PRE-CLINICAL

22 new pre-clinical research sites were added in 2016.



**59**North America

35 Europe **26**Asia

3 Oceania

Pre-clinical research sites are any site conducting non-human FUS research to collect data in support of the safety or feasibility of clinical applications.

#### Master key all regions

# 63 indications are being researched at pre-clinical sites worldwide.

#### Cardiovascular Miscellaneous Neurological **Pediatrics** Cervical cancer Atherosclerosis **S** Glaucoma Colorectal cancer Alzheimer's disease \* Neuroblastoma, pediatric Atrial fibrillation # Head & neck cancer Esophageal cancer Amyotrophic lateral \* Osteoid osteoma Cardiac dysrythmias **X** Melanoma sclerosis Head & neck cancer \* Soft tissue tumors, benign Congestive heart failure ★ Soft tissue cancer Kidney cancer Brain cancer Urological ♣ Deep vein thrombosis Liver cancer Soft tissue tumors, benign Brain tumors, benign Hypertension Acute tubular necrosis Depression Lung cancer Musculoskeletal Peripheral artery disease Benign prostatic hyperplasia Epilepsy Melanoma Septal perforation Back pain, facetogenic Bladder cancer Essential tremor Neuroblastoma, pediatric Back pain, sacroiliitis Hydrocephalus Ovarian cancer Kidney cancer **Endocrine Disorders** Bone cancer Kidney stones Neuropathic pain Pancreatic cancer Diabetes Bone metastases Prostate cancer Painful amputation stump Prostate cancer Obesity Bone tumors, benign Ureterocele neuromas Soft tissue cancer Thyroid cancer Disc degeneration Parkinson's disease Thyroid cancer Women's Health ▲ Thyroid nodules Muscle atrophy Stroke Pain Breast cancer Osteoarthritis Traumatic brain injury Gastrointestinal Osteoid osteoma Breast fibroadenoma ▼ Back pain, facetogenic Trigeminal neuralgia Colorectal cancer Spinal cord injury cervical cancer Back pain, sacroiliitis Esophageal cancer Oncological Cancer pain Fetal surgery Liver cancer Ovarian cancer Bladder cancer Neuropathic pain Pancreatic cancer Osteoid osteoma Polycystic ovary syndrome Bone cancer Uterine adenomyosis Bone metastases ▼ Painful amputation stump Brain cancer neuromas Uterine fibroids

Breast cancerCancer pain

Pre-clinical research sites are any site conducting non-human FUS research to collect data in support of the safety or feasibility of clinical applications.

# **North America** Sites by Region

Canada	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
Lawson Health Research Institute			*				000			•	
Ryerson University							<b>⇔</b>				ů
Sunnybrook Health Sciences Centre	+	<b>A</b>	*	××	•			<b>V</b>	*	•	* *
The Hospital for Sick Children (SickKids)				×	• • •		0000	<b>~</b>	* *	<b>*</b>	ů
Thunder Bay Regional Research Institute							<b>© ©</b>			<b>•</b>	**
University of Alberta							<b>©</b>			<b>•</b>	

#### **United States**

Artann Laboratories					<b>O O</b>			•	÷
Boston University	++		×		0000			<b>♦</b>	÷
Brigham and Women's Hospital					<b>©</b>				ů.
BURL Concepts Inc.					<b>•</b>		*		
сні St. Luke's Health									*
Children's National Health System	+		×	• • •	<b>0 0 0</b>	<b>V V</b>	**	<b>♦</b>	
Cincinnati Children's Hosp. Medi. Center			×	•	<b>O</b>		*		

#### Region | North America\*

#### Cardiovascular

- Atherosclerosis
- Cardiac dysrythmias
- Congestive heart failure
- ♣ Deep vein thrombosis
- Hypertension
- Peripheral artery disease
- Septal perforation

#### Endocrine Disorders

- Diabetes
- Obesity
- Thyroid cancer
- Thyroid nodules

#### Gastrointestinal

- Colorectal cancer
- Esophageal cancer
- Liver cancer
- Pancreatic cancer

#### Miscellaneous

- ★ Head & neck cancer
- **\*** Melanoma
- Soft tissue cancer
- Soft tissue tumors, benign

#### Musculoskeletal

- Back pain, facetogenic
- Back pain, sacroiliitis
- Bone cancer
- Bone metastases
- Bone tumors, benign
- Muscle atrophy
- Osteoarthritis
- Osteoid osteoma
- Spinal cord injury

#### Neurological

- Alzheimer's disease
- Amyotrophic lateral sclerosis

- Brain cancer
- Brain tumors, benign
- Depression
- Epilepsy
- Essential tremor
- Hydrocephalus
- Neuropathic pain
- Painful amputation stump neuromas
- Parkinson's disease
- Stroke
- Traumatic brain injury
- Trigeminal neuralgia

#### Oncological

- Bladder cancer
- Bone cancer
- Bone metastases
- Brain cancer
- Breast cancer Cancer pain

- Cervical cancer
- Colorectal cancer
- Esophageal cancer
- Head & neck cancer
- Kidney cancer
- Liver cancer
- Melanoma
- Neuroblastoma
- Pancreatic tumors
- Prostate cancer
- Soft tissue cancer
- Thyroid cancer

#### Pain

- Back pain, facetogenic
- Back pain, sacroiliitis
- Cancer pain
- Neuropathic pain
- Osteoid osteoma

#### **Pediatrics**

- \* Neuroblastoma, pediatric
- \* Osteoid osteoma
- \* Soft tissue tumors, benign

#### Urological

- Bladder cancer
- Kidney cancer
- Kidney stones
- Prostate cancer
- Ureterocele

#### Women's Health

- Breast cancer
- Breast fibroadenoma
- cervical cancer
- Fetal surgery
- Polycystic ovary syndrome
- Uterine adenomyosis
- Uterine fibroids

Pre-clinical research sites are any site conducting non-human FUS research to collect data in support of the safety or feasibility of clinical applications. \*Indications not being researched in a region have been removed from the key.

United States continued	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain Po	eds Urologica	Women's Health
City of Hope			*				000		•	ŵ
Columbia University			* *				000			☆ ☆
Drexel University			* *				0000			ŵ
Duke University										÷
Food and Drug Administration										
Fox Chase Cancer Center					•		000		•	\$
Georgia Institute of Technology							<b>©</b>			
Indiana University Health, Univ. Hospital							<b>O</b>		•	
Johns Hopkins University School of Medicine		<b>A</b>	<b>%</b>				<b>○ ○ ○</b> ○		<b>* *</b>	
Mayo Clinic - Minnesota				×	• • •		<b>○                                    </b>	<b>V</b>	•	*
Medical University of South Carolina			*				<b>⇔</b>			
Memorial Sloan-Kettering Cancer Center					•		<b>⇔</b>	<b>V</b>		
Montefiore Medical Center							<b>©</b>		•	
National Institutes of Health	+		**		•		<b>O O</b>			*
Northeastern University										
Oklahoma State University	+		*	×	•		0000		<b>*</b>	
San Diego State University			*				<b>⇔</b>			ric .
Stanford University School of Medicine			*	*	• • •		0000	k ▼▼	: ••	ů
suny Upstate Medical University					• •		<b>0 0</b>			
Swedish Neurosciences Institute										
The Methodist Hospital	+		*				<b>⇔</b>			sh.
Tulane University	+		*		•		0000	_	<b>* *</b>	ů
University of California Davis			**	××					•	*
University of California Los Angeles							<b>000</b>		•	*
University of California San Francisco			*	×	••••		0000	k ▼▼	* * •	ů
University of Chicago	+				•		<b>000</b>		•	* *
University of Cincinnati	++		*				0			
University of Illinois at Urbana-Champaign		*		××			000	k	:	ŵ
University of Kansas	+			××			<b>0 0</b>	k	:	ů.
University of Maryland School of Medicine				×	•		<b>○</b> ○ ○			ŵ
University of Michigan	+						<b>O O</b>		<b>* *</b>	*
University of Minnesota	++	*			0		<b>©</b>	$\overline{}$		÷

Pre-clinical research sites are any site conducting non-human FUS research to collect data in support of the safety or feasibility of clinical applications.

# PRE-CLINICAL

United States continued	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
University of Pennsylvania		*					0				
University of Southern California Keck Hosp.							00			<b>*</b> *	
University of Texas at Austin											
University of Texas MD Anderson Cancer Center			* *			••	<b>○</b> ○ ○ ○			•	ಭ
University of Texas Southwestern Medical Center					•		•	<b>V</b>	* *	<b>•</b>	ů.
University of Utah	+				•		0				ជ ជ
University of Virginia Health System					•		00				ಭ
University of Washington	+++	<b>A</b>	* * *	××	•			•	*	<b>* * * *</b>	ů
Urology Centers of Alabama							0			<b>•</b>	
Vanderbilt University			*				00				ជុំជ្
Wake Forest University Baptist Medical Center				××		••	<b>&amp; &amp;</b>		*		
Washington University in St. Louis	+										
Weill Cornell Medical Center							<b>©</b>				ů
Worcester Polytechnic Institute							<b>©</b>				

# **Europe** Sites by Region

Cyprus	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain Pe	ds Urological	Women's Health
Cyprus University of Technology	÷		*		• •		<b>○ ○ ○ ○</b>			
France	:	:	3			•			:	
Centre Léon Bérard			* *				<b>○                                    </b>			ŵ
сни de Bordeaux - Hôpital Saint-André			*				0			ជ ជ
Hôpital A. Michallon				×						
Hôpital Cochin			•••				<b>©</b>			
Hospices Civils de Lyon				×			<b>©</b>		•	
Inserm Lyon	+++		* *	×				•	<b>* *</b>	*
Institut Langevin-EXPCI										
Germany										
German Cancer Research Center										
Heidleberg			•				<b>○</b>		•	
Klinikum Fürth							<b>©</b>		•	
srh Waldklinikum Gera							<b>*</b>			
University Hospital of Cologne			*		•		<b>○ ○ ○</b> ○	•		
University Hospital Schleswig-Holstein			*				<b>②</b>			ů.

#### Region | Europe\*

#### Cardiovascular

- Atherosclerosis
- Atrial fibrillation
- Cardiac dysrythmias
- ♣ Deep vein thrombosis

#### Gastrointestinal

- Liver cancer
- Pancreatic cancer

#### Miscellaneous

- **X** Glaucoma
- **★** Soft tissue tumors, benign

#### Musculoskeletal

- Back pain, facetogenic
- Back pain, sacroiliitis
- Bone cancer
- Bone metastases
- Disc degeneration
- Muscle atrophy
- Osteoarthritis
- Osteoid osteoma

#### Neurological

- Alzheimer's disease
- Brain cancer
- Brain tumors, benign
- Depression Epilepsy
- Essential tremor
- Neuropathic pain

#### Painful amputation stump

- neuromas
- Parkinson's disease
  - Stroke
  - Trigeminal neuralgia

#### Oncological

- Bone cancer
- Bone metastases
- Brain cancer
- Breast cancer
- Cancer pain
- Kidney cancer
- Liver cancer
- Lung cancer Pancreatic cancer
- Prostate cancer

#### Pain

- Back pain, facetogenic
- Back pain, sacroiliitis
- Cancer pain
- ▼ Neuropathic pain
- V Osteoid osteoma
- ▼ Painful amputation stump neuromas

#### **Pediatrics**

- \* Osteoid osteoma
- \* Soft tissue tumors, benign

#### Urological

- Kidney cancer
- Kidney stones
- Prostate cancer

#### Women's Health

- Breast cancer
- Fetal surgery
- Uterine adenomyosis
- Uterine fibroids

Pre-clinical research sites are any site conducting non-human FUS research to collect data in support of the safety or feasibility of clinical applications.

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

# PRE-CLINICAL

Germany continued	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
University of Heidelberg						_	<b>©</b>				
University of Munich					•			<b>V</b>	*		
Israel											
Chaim Sheba Medical Center							000			•	ů ů
Rambam Medical Center							•				
Italy											
European Institute of Oncology			*				•				
Istituto Ortopedico Rizzoli				*	••••	••	<b>○ ○ ○</b>	<b>***</b>	**		
Scuola Superiore Sant'Anna	+						•			<b>♦</b>	
University of Turin							•				*
The Netherlands					'						
University Medical Center Utrecht			* *				000			•	
										· ·	
Norway				1							
Oslo University Hospital Rikshopitalet			*				•				*
Spain											
Hospital Clínico San Carlos				×							
Instituto Cartuja de Técnicas Avanzadas en Medicina					•		•				ů
La Paz University Hospital											
Switzerland	•										
University of Zurich, Children's Hospital							•				
Geneva University Hospital				×							
University of Geneva			*				0				
United Kingdom					•						
Churchill Hospital											ŵ
Imperial College London											*
Institute for Medical Science and Technology	+		*		•		0000	<b>V</b>		<b>* *</b>	ಭ
St. Mary's Hospital			*		•		000			<b>* *</b>	*
The Institute of Cancer Research					•		•				
University of Dundee							•				

Pre-clinical research sites are any site conducting non-human FUS research to collect data in support of the safety or feasibility of clinical applications.

# Asia Sites by Region

China	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
Chongqing Medical University			*	×	•		000				ជា ជា ជ
Fundan University Shanghai Cancer Center							0				ů
наги Hospital			*	×			000	<b>V</b>	**	<b>*</b>	* *
Peking Union Hospital, Chinese Academy of Medical Sciences			*				0				
PLA 301 Hospital (General Hospital of the People's Liberation Army)			*	×	•		000	<b>V</b>	**	<b>*</b>	* *
Southern Medical University							<b>©</b>				ů
Sun Yat-Sen University											
Wenzhou Medical University							<b>②</b>				

#### India

GSL Medical College			•	<b>②</b>	<b>V</b>		*
Jaslok Hospital and Research Centre							<b>\$</b>

#### Iran

II all						
Iran University of Medical Sciences		*		<b>②</b>		

#### Region | Asia\*

#### Cardiovascular

- + Congestive heart failure
- Hypertension

#### Endocrine Disorders

Diabetes

#### Gastrointestinal

- Colorectal cancer
- Liver cancer
- Pancreatic cancer

#### Miscellaneous

- Soft tissue cancer
- Soft tissue tumors, benign

#### Musculoskeletal

- Back pain, facetogenic
- Bone cancer
- Bone metastases
- Osteoarthritis
- Osteoid osteoma

#### Neurological

- Alzheimer's disease
- Brain cancer
- Brain tumors, benign
- Depression
- Parkinson's disease
- Stroke

#### Oncological

- Bone cancer
- Bone metastases
- Brain cancer
- Breast cancer
- Cervical cancer
- Colorectal cancer
- Kidney cancer
- Liver cancer
- Lung cancer
- Ovarian cancer Pancreatic tumors
- Prostate cancer
- Soft tissue cancer

#### Pain

- Back pain, facetogenic
- Osteoid osteoma

#### **Pediatrics**

- \* Osteoid osteoma
- \* Soft tissue tumors, benign

#### Urological

- Acute tubular necrosis
- Benign prostatic hyperplasia
- Kidney cancer
- Kidney stones
- Prostate cancer

#### Women's Health

- Breast cancer
- Breast fibroadenoma
- **\$** Fetal surgery
- \* Ovarian cancer
- Uterine adenomyosis
- Uterine fibroids

Pre-clinical research sites are any site conducting non-human FUS research to collect data in support of the safety or feasibility of clinical applications. \*Indications not being researched in a region have been removed from the key.

# PRE-CLINICAL

	1	Endrocrine	Gastro-				l			<u> </u>	Women's
Japan	Cardiovascular	Disorders	intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Health
Breastopia Namba Hospital							•				ů
Kochi University Hospital					•			<u></u>			
Osaka University	+										
Tohoku University											÷

#### **Republic of Korea**

Asan Medical Center		•			<b>©</b>		
Chaum Hospital					•		<b>* *</b>
Seoul National University Hospital		•	××		0000	*	☆ ☆
The Catholic University of Korea							

#### **Singapore**

Nanyang Technological University	+	<b>* *</b>		0000	<b>* * *</b>	ជំ ជំ ជំ
				<b>***</b>	<b>* *</b>	

#### **Taiwan**

Academia Sinica				<b>O O</b>			ů
Chang Gung University				<b>•</b>			
National Taiwan University				<b>O</b>			
National Tsing Hua University				<b>©</b>			
National Yang-Ming University				<b>O</b>		<b>\</b>	
Taipei Medical University Hospital				<b>O</b>		<b>•</b>	



Australia	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
Future Medical Imaging Group				×	•••		<b>•</b>	▼	*		☆ ☆
Royal Women's Hospital Melbourne					•		<b>•</b>				* *
University of Queensland											

Region | Oceania\* Miscellaneous Soft tissue tumors, benign

Musculoskeletal Bone metastases

 Osteoarthritis Osteoid osteoma

Neurological Alzheimer's disease Amyotrophic lateral

sclerosis

Oncological Bone metastases

**Pain** 

Osteoid osteoma

**Pediatrics** 

\* Osteoid osteoma

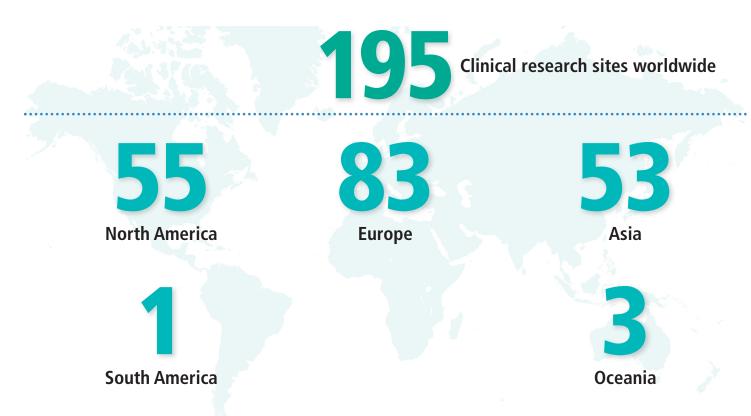
Women's Health

Uterine adenomyosis

Uterine fibroids

Pre-clinical research sites are any site conducting non-human FUS research to collect data in support of the safety or feasibility of clinical applications. \*Indications not being researched in a region have been removed from the key.

14 new clinical research sites were added in 2016.



#### Master key all regions

39 indications are being researched at clinical sites worldwide.

#### Cardiovascular

- Hypertension
- + Peripheral artey disease

#### Endocrine Disorders

- Thyroid cancer
- ▲ Thyroid nodules

#### Gastrointestinal

- Liver cancer
- Malignant obstructive jaundice
- Pancreatic cancer

#### Miscellaneous

- **X** Glaucoma
- ★ Head & neck cancer
- **X** Hypersplenism
- **\*** Melanoma
- Soft tissue cancer
- **★** Soft tissue tumors, benign

#### Musculoskeletal

- Back pain, facetogenic
- Back pain, sacroiliitis
- Bone cancer
- Bone metastases
- Osteoarthritis
- Osteoid osteoma

#### Neurological

- Alzheimer's disease
- Amyotrophic lateral sclerosis
- Brain cancer
- Brain tumors, benign
- Depression
- Epilepsy
- Essential tremor
- Neuropathic painObsessive-compulsive
- disorder

  Painful amputation stump
- neuromas

  Parkinson's disease

#### Oncological

- Bone cancer
- Bone metastases
- Brain cancer
- Breast cancer
- ♦ Head & neck cancer
- Kidney cancer
- Liver cancer
- Melanoma
- Pancreatic cancer
- Prostate cancer
- Soft tissue cancer
- Thyroid cancer

#### Pain

- Back pain, facetogenic
- ▼ Back pain, sacroiliitis
- ▼ Neuropathic pain
- Osteoid osteoma
- Painful amputation stump neuromas

#### **Pediatrics**

- \* Osteoid osteoma
- \* Soft tissue tumors, benign

#### Urological

- Benign prostatic hyperplasia
- Kidney cancer
- Kidney stones
- Prostate cancer

#### Women's Health

- Breast cancer
- **\$** Breast fibroadenoma
- Tubal pregnancy
- Uterine adenomyosis
- Uterine fibroids

# North America Sites by Region

Canada	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
Jewish General Hospital							0			•	
London Health Sciences Centre							<b>O</b>			•	
Princess Margaret Hospital							<b>O</b>			<b>•</b>	
Sunnybrook Health Sciences Centre				×	•		0000			•	ů
The Hospital for Sick Children (SickKids)					•			<b>V</b>	*		
Thunder Bay Regional Research Institute											*
Toronto General Hospital					•		<b>©</b>				ů
Toronto Western Hospital											
University of Western Ontario							0			<b>•</b>	

#### **United States**

Arkansas Heart Hospital	+								
Brigham and Women's Hospital					<b>○ ○</b>			•	*
сні St. Luke's Health									ů.
Children's National Health System			×	•		▼	**		
Cincinnati Children's Hosp. Medi. Center			×			<b>V</b>	**		
City of Hope					00			•	
Cleveland Clinic					0			•	
Duke University									<b>☆</b>
Grand Strand Urology					<b>©</b>			<b>•</b>	
Henry Ford Hospital					0			<b>•</b>	

#### Regions Cardiovascular Neurological Oncological **Pediatrics** North America\* Peripheral arteryl disease Bone metastases Alzheimer's disease \* Osteoid osteoma South America\* Amyotrophic lateral Brain cancer \* Soft tissue tumors, benign Miscellaneous ♣ Head & neck cancer sclerosis ★ Head & neck cancer Urological Brain cancer Kidney cancer ★ Melanoma Benign prostatic hyperplasia Brain tumors, benign Melanoma ★ Soft tissue cancer Kidney cancer Prostate cancer Epilepsy Soft tissue tumors, benign Prostate cancer Essential tremor Soft tissue cancer Musculoskeletal Neuropathic pain Women's Health Pain Back pain, facetogenic Parkinson's disease Breast fibroadenoma Back pain, facetogenic Bone metastases Uterine fibroids Neuropathic pain Osteoid osteoma Osteoid osteoma

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

# CLINICAL

United States	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain I	Peds	Urological	Women's Health
United States continued							_			9	
ndiana University Health, University Hospital							•			•	
Johns Hopkins University School of Medicine							•			•	
Mayo Clinic - Minnesota				×	•		<b>O O</b>	<u></u>			ů
Memorial Sloan-Kettering Cancer Center							<b>O</b>			<b>•</b>	
Vetropolitan Urology							<b>©</b>			<b>•</b>	
Vliami Children's Hospital							<b>②</b>				
Montefiore Medical Center							<b>©</b>			<b>•</b>	ů
New York-Presbyterian Hospital											ric .
New York University - Langone Medical Center							•			•	
Ohio State University											
Oregon Health and Science University											ŵ
ProMedica Toledo Hospital										<b>♦</b>	
Southeast Urology Network							<b>©</b>			<b>•</b>	
Sperling Prostate Center							0			<b>•</b>	
Stanford University School of Medicine				×	• • •		00	<b>▼</b> :	**	<b>•</b>	ů
Swedish Neurosciences Institute							<b>©</b>				
University Hospitals of Cleveland Case Medical Center							•			•	
University MRI & Diagnostic Imaging Centers - South											ů
University of California Los Angeles							<b>©</b>			<b>•</b>	ů
University of California San Diego Thornton Hospital											ů
University of California San Francisco				×	• • •		00	▼ ▼ :	**	<b>•</b>	ů
Jniversity of Chicago							<b>©</b>			<b>•</b>	ů
University of Maryland School of Medicine							•	▼			
Jniversity of Michigan										<b>•</b>	ů
University of Southern California Keck Hospital							<b>•</b> •			<b>* *</b>	
Jniversity of Texas MD Anderson Cancer Center											ů
Jniversity of Texas Southwestern Medical Center							0	<b>V</b> :	*	•	ů
Jniversity of Virginia Health System				×			<b>O O</b>			<b>♦</b>	ŵ

United States continued	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
University of Wisconsin Carbone Cancer Center							<b>&amp;</b>			•	
Urology Centers of Alabama							<b>©</b>			•	
Urology of San Antonio							<b>©</b>			•	
Vanderbilt University											ů
Walter Reed National Military Medical Center											ŵ
Weill Cornell Medical Center											ů
William Beaumont Health Systems							<b>O</b>			•	
Winthrop University Hospital							<b>©</b>			•	



#### **South America**

Sites by Region

Brazil	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
Instituto do Cancer do Estado de					• • •		<b>©</b>	<b>V</b>	*		th.
Sao Paulo											

#### **Regions** Cardiovascular Neurological Oncological **Pediatrics** North America\* + Peripheral artery disease Bone metastases Alzheimer's disease \* Osteoid osteoma South America\* Amyotrophic lateral Brain cancer \* Soft tissue tumors, benign Miscellaneous sclerosis ♦ Head & neck cancer ★ Head & neck cancer Urological Brain cancer Kidney cancer ★ Melanoma Benign prostatic hyperplasia Brain tumors, benign Melanoma ★ Soft tissue cancer Kidney cancer Prostate cancer Epilepsy Soft tissue tumors, benign Prostate cancer Essential tremor Soft tissue cancer Musculoskeletal Neuropathic pain Women's Health Pain Parkinson's disease Back pain, facetogenic Breast fibroadenoma Back pain, facetogenic Bone metastases Uterine fibroids Neuropathic pain Osteoid osteoma Osteoid osteoma

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

# Europe Sites by Region

Austria	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
Medical University of Vienna	+						<b>©</b>			<b>*</b>	
Belgium											
Institut Jules Bordet							0			<b>•</b>	
Czech Republic											
Mestska Nomocnice Ostrava	+										
Na Homolce Hospital	+										
St. Anne's Hospital	+										
Thomayer University Hospital											ů.
University Hospital - Brno	+										
France											
Centre Léon Bérard			<b>* *</b>				<b>0 0 0</b>				th:
сни de Bordeaux - Hôpital du Tondu							<b>©</b>			<b>*</b>	
сни de Bordeaux - Hôpital Saint-André	+		* *				000				* *
сни de Lille - Hôpital Huriez							0			•	
сни de Toulouse - Hôpital Rangueil							<b>©</b>			<b>•</b>	
сни de Tours - Hôpital Bretonneau			*				<b>©</b>				
Hôpital Univeristaire Pitié-Salpêtrière							<b>O</b>				
Hospices Civils de Lyon							0			•	
Inserm Lyon			*	×			0000			<b>*</b> *	☆ ☆
Institut Gustave Roussy							0				

#### Region

Europe\*

#### Cardiovascular

- Hypertension
- Peripheral artery disease

#### Endocrine Disorders

▲ Thyroid nodules

#### Gastrointestinal

- Liver cancer
- Pancreatic cancer

#### Miscellaneous

- **≭** Glaucoma
- ★ Soft tissue cancer
- **≭** Soft tissue tumors, benign

#### Musculoskeletal

- Back pain, facetogenic
- Back pain, sacroiliitis
- Bone cancer
- Bone metastases
- Osteoarthritis
- Osteoid osteoma

#### Neurological

- Brain cancer
- Brain tumors, benign
- Essential tremor
- Neuropathic pain
- Painful amputation stump neuromas
- Parkinson's disease

#### Oncological

- Bone cancer
- Bone metastases
- Brain cancer

#### Breast cancer

- Kidney cancer
- Liver cancer
- Pancreatic cancer
- Prostate cancer
- Soft tissue cancer

#### Pain

- ▼ Back pain, facetogenic
- Back pain, sacroiliitis
- Neuropathic pain
- Osteoid osteoma
- Painful amputation stump neuromas

#### **Pediatrics**

- \* Osteoid osteoma
- \* Soft tissue tumors, benign

#### Urological

- Kidney cancer
- Kidney stones
- Prostate cancer

#### Women's Health

- Breast cancer
- Breast fibroadenoma
- Uterine adenomyosis
- Uterine fibroids

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

France continued	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
nstitut Mutualiste Montsouris							<b>©</b>			•	
University of Nice Sophia Antipolis							0			<b>A</b>	
oriversity or vice soprila Artipolis											
Germany											
Amper Klinik				×	• • • •		<b>⇔</b>	<b>V V</b>	*		☆ ☆
Brustzentrum Marienhospital Bottrop											* * *
Charité Universitätsmedizin Berlin							<b>⇔</b>			<b>♦</b>	ŵ
Clemenshospital GmbH	+										
German Cancer Research Center Heidelberg							•			•	
German Heart Centre - Munich	+										
Klinikum Fürth							<b>©</b>			<b>•</b>	
Krankenhaus Nordwest					•			<b>V</b>			
Sana CardioMed Nord	+										
Universitaeres Herzzentrum Hamburg GmbH	+										
Universitaetsklinikum Erlangen	+										
Universitätsklinikum Tübingen											*
University Hospital Bonn	+		* *				<b>O O</b>				
University Hospital Frankfurt		<b>A</b>									
University Hospital of Cologne			•	×	•		0000				<b>\$</b>
University Hospital of Leipzig	++										
University Hospital Schleswig-Holstein											*
University of Munich							•				*
Urologische Universitätsklinik Magdeburg							<b>©</b>			<b>•</b>	
Israel											
Chaim Sheba Medical Center							<b>©</b>				ů
Rambam Medical Center								▼			
Italy											
Azienda Ospedaliera San Paolo				×							
Careggi General Hospital			* *	×			<b>○ ○ ○ ○</b>		*	<b>♦</b>	* *
Cisanello Hospital of University of Pisa				×	•		<b>O O</b>	<b>V</b>	**	<b>♦</b>	* *
Clinica oculistica Università - Ospedale oftalmico				×							
European Institute of Oncology			* *	×	• •		0000	<b>V</b>	**		* * *

# CLINICAL

Italy continued	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
stituto Ortopedico Rizzoli				××	• • • •	-	0000	<b>V V V</b>	**	•	
Laboratorio di Tecnologie Oncologiche (LATO) HSR Giglio, Fondazione Istituto San Raffaele G. Giglio di Cefalu							•				÷
Niguarda Hospital											* *
Regina Apostolorum Albano		<b>A</b>									
St. Orsola-Malpighi Teaching Hospital				×							
Università degli Studi di Parma				×							
University Eye Clinic of Genoa				×							
University of L'Aquila					• •		<b>O</b>	▼	*		* *
University of Perugia							<b>©</b>			<b>•</b>	
University of Rome - La Sapienza			<b>%</b>		• • •		<b>**</b>	<b>V</b>	*		* *
Netherlands							•				
Radboud University Nijmegen Medical Centre							•			•	
University Medical Center Utrecht			*				0000			<b>♦</b>	☆ ☆
Norway				-			:				
Haukeland University Hospital			•				<b>©</b>				
The Intervention Centre, Oslo University Hospital Rikshopitalet											*
Poland											
Szpital Pro-Familia											÷
Russia											
Medical Center of Central Bank of Russian Federation			*	*	•		000	▼	**	<b>♦</b>	<b>\$</b> \$
N. N. Petrov Research Institute of Oncology							•				¢
National Medical Surgery Center			*	×			000	▼	**	<b>♦</b>	* *
Research Center for Obstetrics, Gynecology and Perinatology of Russian Ministry of Health and Social Development											ŵ
Rostov Scientific Research Institute of Oncology					•		•				

Spain	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
сілас нм Puerta del Sur											
Hospital Clínico San Carlos				×							
Hospital Universitari Mutua Terrassa			•				•				
Instituto Cartuja de Técnicas Avanzadas en Medicina											ů
ResoFus - Centre Medic Alomar							<b>©</b>			•	

#### **Switzerland**

J 11112 G 1 1 G 1 1 G						_		
Fus-Center, University of Zurich, Children's Hospital				<b>&amp;</b>	▼			
Kantonsspital Aarau				<b>•</b>				
Kantonsspital Winterthur				0				* *
University Hospital Zurich				<b>©</b>			•	

#### **United Kingdom**

				-				
Birmingham Heartlands Hospital	+							
Churchill Hospital		* *			0000		<b>♦</b>	th.
Southampton University Hospital	+							
St. Bartholomew's Hospital	+							
St. Mary's Hospital		*			000		<b>* *</b>	÷
The Institute of Cancer Research			•		<b>©</b>			
University Hospital of Wales	+							
University of Glasgow	+							
University of Hull					<b>***</b>			÷

#### Region

Europe\*

#### Cardiovascular

- Hypertension
- Peripheral artery disease

#### Endocrine Disorders

▲ Thyroid nodules

#### Gastrointestinal

- Liver cancer
- Pancreatic cancer

#### Miscellaneous

- **≭** Glaucoma
- Soft tissue cancer
- **✗** Soft tissue tumors, benign

#### Musculoskeletal

- Back pain, facetogenic
- Back pain, sacroiliitis
- Bone cancer
- Bone metastases
- Osteoarthritis
- Osteoid osteoma

#### Neurological

- Brain cancer
- Brain tumors, benign
- Essential tremor
- Neuropathic pain
- Painful amputation stump
- neuromas

  Parkinson's disease

#### Oncological

- Bone cancer
- Bone metastases
- Brain cancer

#### Breast cancer

- Kidney cancer
- Liver cancer
- Pancreatic cancer
- Prostate cancer
- Soft tissue cancer

#### Pain

- Back pain, facetogenic
- ▼ Back pain, sacroiliitis
- Neuropathic pain
- Osteoid osteoma
- Painful amputation stump neuromas

#### **Pediatrics**

- \* Osteoid osteoma
- \* Soft tissue tumors, benign

#### Urological

- Kidney cancer
- Kidney stones
- Prostate cancer

#### Women's Health

- Breast cancer
- Breast fibroadenoma
- Uterine adenomyosis
- Uterine fibroids

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

# **Asia**Sites by Region

China	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
307 Hospital of PLA			*	×	•		<b>000</b>	▼	**	<b>♦</b>	ជ ជ
Central Hosp. of Shanghai Xuhui District											÷
Children's Hospital of Chongqing Medical University			*	×	•		000	<b>V</b>	**	<b>*</b>	* *
Chinese University of Hong Kong											ů
Chongqing Medical University				×							ជាជា
First Affiliated Hospital of Medical College of Xi'an Jiaotong University							<b>②</b>				*
First Affiliated Hospital of Shihezi Univ.			*					0			
First Affiliated Hospital of Zunyi Medical College			*	×	•		<b>⇔</b>	<b>V</b>	**	<b>*</b>	* *
First Maternal and Child Health Hospital of Shanghai			*	×	•		₩ ↔	<b>V</b>	**	<b>*</b>	* *
Fundan University Huashan Hospital							•				ů
Fundan University Shanghai Cancer Center											*
наги Hospital			*	×			000	<b>V</b>	**	<b>♦</b>	* *
Henan University Huaihe Hospital											ů
Institute of Ultrasonic Engineering in Medicine and Clinical Centre for Tumour Therapy	+		*	×			<b>○ ○ ○</b>	<b>V</b>	**	<b>*</b>	* *
Peking Union Hospital, Chinese Academy of Medical Sciences											÷

# Region Asia\* Hypertension Endocrine Disorders Thyroid cancer Thyroid nodules Gastrointestinal Liver cancer Malignant obstructive

# jaundice Pancreatic cancer Miscellaneous Hypersplenism Soft tissue tumors, benign

Osteoarthritis
Osteoid osteoma

Neurological
Brain cancer
Depression
Essential tremor
Obsessive-compulsive disorder
Parkinson's disease

Musculoskeletal

Back pain, facetogenic

Back pain, sacroiliitis

Bone cancer

Bone metastases

# Oncological Bone cancer Bone metastases Brain cancer Breast cancer Kidney cancer Liver cancer Pancreatic cancer Prostate cancer

Pancreatic cancer
 Prostate cancer
 Thyroid cancer
 Pain
 Pack pain, facetogenic
 Back pain, sacroiliitis
 Osteoid osteoma

#### **Pediatrics**

- \* Osteoid osteoma
- \* Soft tissue tumors, benign

#### Urological

- Benign prostatic hyperplasia
- Kidney cancer
- Kidney stones
- Prostate cancer

#### Women's Health

- Breast cancer
- \* Breast fibroadenoma
- Tubal pregnancy
- Uterine adenomyosis
- Uterine fibroids

Clinical research sites are any site treating patients as part of a clinical study.

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

China continued	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
Peking University First Hospital											ŵ
PLA 301 Hospital (General Hospital of the People's Liberation Army)			*	×	•		000	<b>V</b>	**	<b>*</b>	* *
Queen Mary Hospital of the University of Hong Kong		<b>A A</b>	*	×	•		0000	<b>V</b>	**	<b>*</b>	* *
Shanghai Jiaotong University							<b>O</b>				
Suining Central Hospital			*	×			<b>000</b>	<b>V</b>	**	<b>♦</b>	* *
The First Affiliated Hospital of Chongqing Medical University			*	×	•		000	•	**	<b>•</b>	* *
The First People's Hospital of Shijiazhuang											÷
The Second Affiliated Hospital of Zhejiang University			*	×			0		*		
The Second Artillery General Hospital of Chinese PLA			**	×	•		0000	▼	**	<b>*</b>	* *
The Third Xiangya Hospital of Central South University			*	×	•		000	<b>V</b>	**	<b>*</b>	* *
Xijing Hospital of The Fourth Military Medical University											*
Xuzhou Central Hospital			*								
Zhabei District Central Hospital							<b>**</b>				*
India											
Apollo Specialty Hospital, Chennai											ŵ
GSL Medical College											÷
Jaslok Hospital and Research Centre							<b>©</b>	_		•	
Japan	-	-		!	-						
Breastopia Namba Hospital							<b>©</b>				ů
Hokuto Hospital							<b>©</b>				ជ ជ
Kochi University Hospital					•			_			
Osaka University											
Shinsuma General Hospital											ជ ជ
Takanobashi Central Hospital							•			<b>•</b>	
Teikyo University							<b>©</b>			•	
Tokai University							<b>©</b>			<b>•</b>	
Tokyo Medical University			*				<b>©</b>				
Washokai Sadamoto Hospital											

Clinical research sites are any site treating patients as part of a clinical study.

## CLINICAL

Kazakhstan	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain Pe	eds Urologica	Women's Health
National Medical Research Center			*	×	•		<b>000</b>	▼	*	* *
Malaysia										
University of Malaya	+		* *	×	••		<b>○</b> ○ ○	▼	*	* * *
Republic of Korea										
сна Bundang Medical Center										☆ ☆
Chaum Hospital										<b>\$</b> \$
иит Intervention Hospital										ជ ជ
The Catholic University of Korea										* *
уимс Gangnam Severance Hospital							<b>⇔ ⇔</b>		•	*
yuмс Severance Hospital										
Singapore										
Nanyang Technological University	+		<b>*</b> *				<b>○ ○ ○ ○</b>		<b>* * *</b>	ជា ជា
Taiwan										
Chang Gung University							<b>©</b>			
National Defense Medical Center							٥		•	
Taipei Medical University Hospital							<b>₩</b>		•	*



Australia	Cardiovascular	Endrocrine Disorders	Gastro- intestinal	Misc.	Musculoskeletal	Neurological	Onocological	Pain	Peds	Urological	Women's Health
Future Medical Imaging Group				××	• • • •		00	<b>V V</b>	**		ជ ជ
Royal Women's Hospital Melbourne							٥				<b>\$ \$</b>
New Zealand											
Mercy Angiography	+										

New Zealand				
Mercy Angiography	+			
Region Oceania*	Cardiovascular Peripheral artey disease	Musculoskeletal  Back pain, facetogenic	Oncological  Bone metastases	Pediatrics * Osteoid osteoma
	Miscellaneous  ➤ Soft tissue cancer  ➤ Soft tissue tumors, benign	<ul><li>Back pain, sacroillitis</li><li>Bone metastases</li><li>Osteoarthritis</li><li>Osteoid osteoma</li></ul>	Pain  Back pain, facetogenic  Neuropathic pain  Osteoid osteoma	<ul> <li>★ Soft tissue tumors, benign</li> <li>Women's Health</li> <li>the Uterine adenomyosis</li> <li>Uterine fibroids</li> </ul>

Clinical research sites are any site treating patients as part of a clinical study.

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

## Commercial Treatment Sites by Indications and Regions

#### **North America**

- 33 Benign prostatic hyperplasia
- 6 Bone metastases
- 1 Breast cancer
- 7 Essential tremor
- ♣ 1 Liver cancer
- ●▼★ 2 Osteoid osteoma
  - ♦ ♦ 46 Prostate cancer
    - 1 Soft tissue tumors, benign

#### **Europe**

- 2 Back pain, facetogenic
- 10 Benign prostatic hyperplasia
- 2 14 Breast cancer
  - 14w Breast fibroadenoma
  - 7 Essential tremor
  - **\*** 17 Glaucoma
- ♦ ♦ 13 Kidney cancer
- ♣ 14 Liver cancer
- 3 Neuropathic pain
- ■▼ \* 13 Osteoid osteoma
  - 2 Pancreatic cancer
    - 6 Parkinson's disease
  - ♦ ② 180 Prostate cancer
    - ★ 13 Soft tissue tumors, benign
  - **\*\*\*** 13 Soft tissue cancer
    - ▲ 11 Thyroid nodules
    - 1 Trigeminal neuralgia2 Uterine adenomyosis
  - 48 Uterine fibroids

#### Asia

- 27 Benign prostatic hyperplasia
- 3 Bone metastases
- 2 90 Breast cancer
  - 3 Breast fibroadenoma
  - 4 Essential tremor
- ♦ ♦ 89 Kidney cancer
- ♣♥ 90 Liver cancer
- ■▼
  \* 89 Osteoid osteoma
  - ♣☼ 2 Pancreatic cancer
  - 1 Parkinson's disease
  - ◆ ❖ 31 Prostate cancer
    - Soft tissue tumors, benign
  - ★② 90 Soft tissue cancer
    - ▲ 3 Thyroid nodules
    - 54 Uterine adenomyosis
    - 177 Uterine fibroids

#### **South America**

- 1 Benign prostatic hyperplasia
- 9 Prostate cancer
  - 1 Uterine fibroids

#### **Africa**

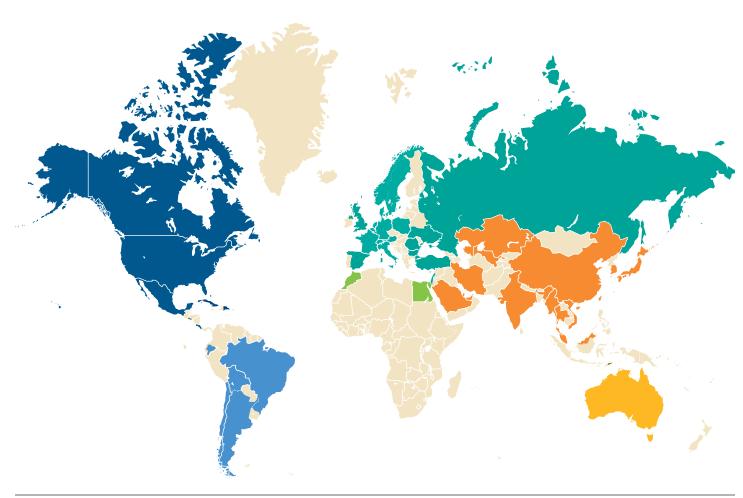
- 1 Breast fibroadenoma
- 🔷 😂 2 Prostate cancer
  - ▲ 1 Thyroid nodules

#### Oceania

2 Uterine fibroids

## COMMERCIAL TREATMENT

## Commercial Treatment Sites by Country



Commercial treatment sites provide treatment with a focused ultrasound system for a regulatory approved indication.

#### North America

- 1 Bahamas
- 9 Canada
- 1 Costa Rica
- 1 Cuba
- 2 Dominican Republic
- 1 Grand Cayman
- 4 Mexico
- 1 Trinidad and Tobago
- 46 United States

#### South America

- 1 Argentina
- 1 Bolivia
- 4 Brazil
- 1 Chile
- 3 Ecuador

#### Europe

- 5 Austria
- 2 Belgium
- 1 Bulgaria
- 1 Denmark
- 70 France
- 55 Germany
- 5 Israel
- 44 Italy 1 Monaco
- 2 The Netherlands
- 2 Norway
- 4 Poland
- 2 Romania

#### 29 Russia

- 8 Spain
- 2 Sweden
- 14 Switzerland
- 1 Turkey
- 1 Ukraine

#### 15 United Kingdom

#### Asia

- 134 China
  - 8 India
  - 1 Iran
- 40 Japan
- 1 Kazakhstan
- 2 Kingdom of Saudi Arabia
- 1 Lebanon
- 1 Malaysia
- 1 Myanmar
- 1 Qatar
- 21 Republic of Korea
- Singapore
- 18 Taiwan
- 2 Thailand
- 1 United Arab Emirates
- 1 Uzbekistan
- 2 Vietnam

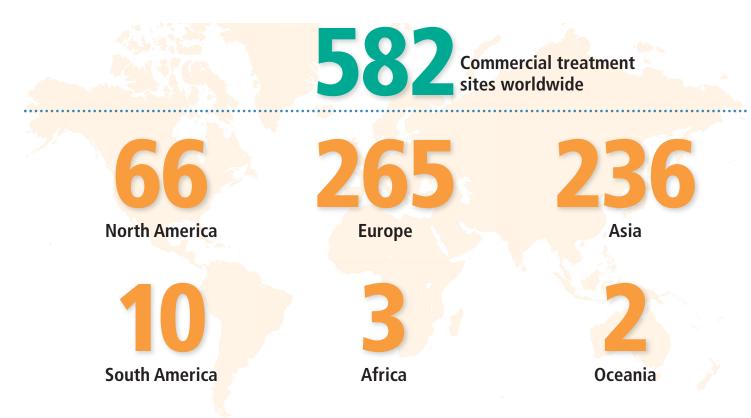
#### Oceania

2 Australia

#### Africa

- 2 Egypt
- 1 Morocco

112 new commercial treatment sites were added in 2016.



 $Commercial\ treatment\ sites\ provide\ treatment\ with\ a\ focused\ ultrasound\ system\ for\ a\ regulatory\ approved\ indication.$ 

#### Master key all regions

21 indications are being treated commercially at sites worldwide.

#### **Endocrine Disorders** Musculoskeletal Women's Health Oncological Pain ▲ Thyroid nodules Breast cancer Bone metastases Bone metastases Back pain, facetogenic Osteoid osteoma Neuropathic pain Breast fibroadenoma Breast cancer Gastrointestinal Osteoid osteoma Uterine adenomyosis Kidney cancer Liver cancer Neurological Uterine fibroids Liver cancer **Pediatrics** Pancreatic cancer Essential tremor Pancreatic cancer Neuropathic pain \* Osteoid osteoma Prostate cancer Miscellaneous Parkinson's disease Soft tissue cancer Urological **X** Glaucoma Trigeminal neuralgia **X** Soft tissue cancer Benign prostatic hyperplasia Kidney cancer Soft tissue tumors, benign Prostate cancer

#### North America

#### **Bahamas**

Doctors Hospital

#### Canada

- Can-Am HIFU
- Cleveland Clinic Canada
- 🔷 😂 Don Mills Surgical U<mark>nit</mark>
- ◆ ♦ Jewish General Hospital
- Les Cours Medical Centre
- London Health Sciences Centre
  - Sunnybrook Health Sciences Centre
  - Thunder Bay Regional Research Institute
  - University of Western Ontario

#### **Costa Rica**

Hospital cıma San Jose

#### Cuba

💠 🗘 💢 🔵 Hospital Medical Surgical Research Center (CIMEQ)

#### **Dominican Republic**

- CEDIMAT
- 🗘 🗘 Clinica Union Medica

#### **Grand Cayman**

Chrissie Tomlinson Hospital

#### Mexico

- Centro Médico Puerta de Hierro
- O Hospital Galenia
  - Medica Sur Tlalpan
- San Javier Hospital Marina

#### **Trinidad and Tobago**

Trinidad Urology Center

#### **United States**

- ◆ ☼ Alamance Urological
- Associated Urology of North Carolina
- Brigham and Women's Hospital
- ♦ © California HIFU
- Carolina Urology Partners
  - City of Hope
- Comprehensive Urology
  - Duke Health Center at Southpoint
- ♦ ② Encino HIFU
- First Urology
- Fox Chase Cancer Center
- Health Orlando
- Houston Premier Urology
- Indiana University School of Medicine
- A Company
   A Compan
  - Mayo Clinic Minnesota
  - Medical College of Wisconsin Froedtert Hospital
- New York Methodist Hospital
- New York University -Langone Medical Center
- 🔷 🔷 😂 Northern Litho
  - Ohio State University
- Piedmont Healthcare Urology
- Prostate Cancer Institue
  - Riverside Methodist Hospital
- Riverside Urology
- San Fernando Valley Urology Associates

#### In this Region North America\*

#### Gastrointestinal

Liver cancer

#### Miscellaneous

- Soft tissue cancer
- Soft tissue tumors, benign

#### Musculoskeletal

- Bone metastases
- Osteoid osteoma

#### Neurological

Essential tremor

#### **Oncological**

- Bone metastases
- Breast cancer
- Kidney cancer
- Liver cancer

#### Prostate cancer

Soft tissue cancer

#### **Pain**

Osteoid osteoma

#### Urological

- Benign prostatic hyperplasia
- Kidney cancer
- Prostate cancer

#### Women's Health

- Breast cancer
- Uterine fibroids

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

- Sarasota Prostate Care
- Scionti Prostate Center
- Skyline Urology
- Stanford University Medical Center
  - - Swedish Neurosciences Institute
    - ◆ ♠ Texas HIFU Partners
      - University MRI & Diagnostic Imaging Centers - South
      - University of California Los Angeles
      - University of California San Diego Thornton Hospital

- University of California San Francisco
  - University of Maryland School of Medicine
- University of Miami Hospital
- University of Southern California Keck Hospital
- university of Virginia Health System
  - ◆ ◆ Urology Center of Winter Park
  - Urology of Mount Dora
  - Urology Specialists of the Carolinas
  - 🔷 🔷 🗘 Virginia ніғи
    - \* Weill Cornell Medical Center
  - ♦ ₩estern States HIFU

In this Region North America\*

#### Gastrointestinal

Liver cancer

#### Miscellaneous

- Soft tissue cancer
- Soft tissue tumors, benign

#### Musculoskeletal

- Bone metastases
- Osteoid osteoma

#### Neurological

- Essential tremor
  - Oncological
- Bone metastases
- Breast cancer
- Kidney cancer

#### Liver cancer

- Prostate cancer
- Soft tissue cancer

#### **Pain**

Osteoid osteoma

#### **Urological**

- Benign prostatic hyperplasia
- Kidney cancer
- Prostate cancer

#### Women's Health

- Breast cancer
- Uterine fibroids

**South America** 

#### **Argentina**

Centro de Urologia

#### **Bolivia**

🕽 😂 Centro de urología avanzada de la Clínica Incor

#### **Brazil**

- Centro de Prostata San Paulo
- ☼ Hospital Ac Camargo de São Paulo
- Hospital Nossa Senhora das Gracas
  - Instituto do Cancer do Estado de Sao Paulo (ICESP)

#### Chile

Clinica Santa María

#### **Ecuador**

- Hospital Carlos Andrade Marin
- Hospital IESS
- Hospital Policia Nacional Guayaqui

In this region South America\*

#### Oncological

Prostate cancer

#### Women's Health Uterine fibroids

#### **Urological**

- Benign prostatic hyperplasia
- Prostate cancer

\*Indications not being researched in a region have been removed from the key.

**265** 

#### **Europe**

#### **Austria**

- Allgemeines Krankenhaus der Stadt Wien
  - Barmherzige Brueder
  - Krankenhaus der Barmherzigen Brüder Wien
- ◆ ♥ TILAK Unternehmen Gesundheit
- ⇔ University of Vienna

#### **Belgium**

- Algemeen Ziekenhuis Middelheim
- ◆ ② Institut Jules Bordet

#### Bulgaria

Saint Marina Hospital

#### Denmark

◆ ★ Aarhus University Hospital

#### France

- American Hospital of Paris
- Centre Hospitalier de Chambéry
- Centre Hospitalier de Saintonge
- Centre Hospitalier du Pays d'Aix
- ◆ **②** Centre Hospitalier Nord de Marseille сни
- ◆ ❖ Centre Hospitalier Universitaire de Caen
- 🔷 😂 сни de Bordeaux Hôpital du Tondu
  - 😩 сни de Bordeaux Hôpital Saint-André
- ♦ 😵 сни de Guadeloupe Hôpital les Abymes
- ◆ 😂 сни de Pontoise Hôpital René Dubos
- 🔷 😂 💠 сни de Lille Hôpital Huriez
  - ♦ 🗘 сни de Limoges Hôpital Dupuytren

- ♦ 🗘 сни de Nice Hôpital Pasteur
- ◆ Сни de Reims Hôpital Robert Debré
- ♦ ⇔ сни de Rouen Hôpital Charles Nicolle
- ♦ 😂 сни de Strasbourg Hôpital Civil
- ♦ 😂 сни de Toulouse Hôpital Rangueil
  - 🕸 сни de Tours Hôpital Bretonneau
  - **\*** CHU Lapeyronie
- Clinique Adassa
  - Clinique Aguilera
- Clinique Belledonne
- Clinique Beau Soleil
- 🔷 😂 Cliniqu<mark>e Chirurgicale du Pre</mark>
- ♦ Clinique Clément Devron
- ◆ ♥ Clinique de l'Union
- Clinique du Palais
- Clinique du Val d'Ouest
  - \* Clinique François Chénieux
  - **X** Clinique Juge
  - \* Clinique Mathilde
  - **X** Clinique Pasteur
- Clinique Saint Augustin
- ◆ ♦ Clinique Saint Etienne Bayonne
- ◆ ♦ Clinique Saint Jean de Dieu
- ◆ ❖ Clinique Saint Jean du Languedoc
- Clinique Saint Jean Montpellier
- Clinique Saint-Michel
- Clinique Saint Nicolas
- Clinique Saint Vincent
- Clinique Sainte Clotilde La Réunion
  - Clinique Sourdille

#### In this region

Europe\*

#### Endocrine Disorders

▲ Thyroid nodules

#### Gastrointestinal

- Liver cancer
- Pancreatic cancer

#### Miscellaneous

- Glaucoma
- Soft tissue cancer
- Soft tissue tumors, benign

#### Musculoskeletal

- Bone metastases
- Osteoid osteoma

#### Neurological

- Essential tremorNeuropathic pain
- Parkinson's disease
- Trigeminal neuralgia

#### Oncological

- Bone metastases
- Breast cancer
- . . . .
  - ses
- Sidney cancer

#### Liver cancer

- Pancreatic cancer
- Prostate cancer
- Soft tissue cancer

#### Pair

- ▼ Back pain, facetogenic
- Neuropathic pain
- Osteoid osteoma

#### Urological

- Benign prostatic hyperplasia
- Kidney cancer
- Prostate cancer

#### Women's Health

- Breast cancer
- \* Breast fibroadenoma
- Uterine adenomyosis
- Uterine fibroids

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

- Clinique urologique Nantes Atlantis
- Clinique Villette
- \* • Fondation Hôpital Saint-Joseph Marseille
  - Groupe Hospitalier Diaconesses Croix Saint-Simon
  - Groupe Hospitalier Prive Saint Joseph-Paris
    - \* Hôpital A. Michallon
    - \* Hôpital Bégin
    - \* Hôpital Claude Huriez
  - ◆ ♦ Hôpital Clinique Claude Bernard Metz
    - \* Hôpital de la Croix-Rousse
    - \* Hôpital des Quinze-Vingts
  - Hôpital Edouard Herriot
  - ♦ ♦ Hôpital Foch
- ▲ ◆ � Hôpital Universitaire Pitié-Salpêtrière
  - ◆ ◆ Hôpital privé La Louvière
  - ◆ ♦ Hôpitaux Civils de Colmar Hôpital Pasteur
  - 🔺 💠 Institut de Radiologie de Paris
  - ◆ ❖ Institut Mutualiste Montsouris
  - Pôle Santé Léonard de Vinci
  - Pôle Santé République
  - Polyclinique Bordeaux Nord Aquitaine
    - \* Polyclinique Côte Basque Sud
  - Polyclinique du Parc Rambot
  - Polyclinique Jean Villar
  - Polyclinique Kenval
  - Polyclinique Montréal
  - ◆ ☼ Polyclinique Ormeaux République
  - Polyclinique Vauban

#### Germany

- Agaplesion Diakonieklinikum Hamburg
  - Amper Klinik
- Asklepios Klinik Barmbek
- Asklepios Kliniken Weißenfels-Hohenmölsen GmbH
- ♦ ♦ Asklepios Paulinen Klinik
- ▲ 🌣 Borad Zentrale Bottrop
- ▲ st Bremen Zentrum fur Nuklearmedizin und PET/CT
- ▲ 🌣 🏚 Brustzentrum Marienhospital Bottrop
  - ▲ \$ Buergerhospital Frankfurt
- 🔷 😂 🏗 Charité Universitätsmedizin Berlin
  - Diagnoseklinik Stephansplatz
  - Diakonie-Klinikum Stuttgart
  - ◆ ❖ Ev. Krankenhaus Göttingen-Weende e.V.
  - ◆ ❖ Franziskus-Krankenhaus
  - Gemeinschaftspraxis für Urologie Mannheim
  - GPR Gesundheits-und Pfegezentrum Russelsheim gGmbH-Klinikum
  - Heilig-Geist Hospital
  - A : HELIOS Klinik Schkeuditz
  - ♦ ۞ Isarklinikum
  - ◆ ♦ Klinik für Prostata-Therapie GmbH
  - Klinik und Poliklinik für Urologie der Universitaet Regensburg am Caritaskrankenhaus St. Josef
  - ♦ ♥ Klinikum Fürth
  - ◆ ❖ Klinikum Itzehoe
  - ♦ ♦ Klinikum Landshut gGmbH

#### In this region

Europe\*

#### Endocrine Disorders

▲ Thyroid nodules

#### Gastrointestinal

- Liver cancer
- Pancreatic cancer

#### Miscellaneous

- **★** Glaucoma
- **X** Soft tissue cancer
- Soft tissue tumors, benign

#### Musculoskeletal

- Bone metastases
- Osteoid osteoma

#### Neurological

- Essential tremor
- Neuropathic pain
- Parkinson's disease
- Trigeminal neuralgia

#### Oncological

- Bone metastases
- Breast cancer
- Kidney cancer

- Liver cancer
- Pancreatic cancerProstate cancer
- Soft tissue cancer

#### Pain

- Back pain, facetogenic
- Neuropathic pain
- Osteoid osteoma

#### Urological

- Benign prostatic hyperplasia
- Kidney cancer
- Prostate cancer

#### Women's Health

- Breast cancer
- Breast fibroadenoma
- Uterine adenomyosis
- tterine fibroids

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

- ♦ ♦ Klinikum Nürnberg
- ♦ ♦ Klinikum Region Hannover Gehrden
- ◆ ❖ Krankenhaus Dresden-Friedrichstadt
- ▼ ◆ ② Krankenhaus Nordwest
  - ◆ 🕏 ккн Klinikum Grossburgwedel
    - Marienhospital Stuttgart
  - ◆ ❖ Missionsärztliche Klinik gGmbH
  - Paracelsus Klinik Reichenbach GmbH
    - ▲ Praxis für Nuklearmedizin Paderborn
  - ◆ ❖ Praxis für Urologie Mannheim
    - Radiologische Gemeinschaftspraxis
  - ◆ ❖ Sankt Katharinen Krankenhaus
  - ♦ ♦ St. Antonius-Hospital
  - ◆ ❖ St. Barbara Hospital
  - ◆ ❖ St. Elisabeth-Krankenhaus Köln-Hohenlind
  - ◆ ♦ St. Elisabeth-Krankenhaus Leipzig
  - ◆ ♦ St. Josefs Hospital GmbH
  - Staedtisches Klinikum München
  - ◆ ❖ Theresienkrankenhaus Mannheim
  - ◆ ❖ Universitaetsmedizin Mannheim
  - Universitäres Herzzentrum Hamburg GmbH
  - Universitätsklinikum Aachen
- ◆ ♦ • University Hospital of Cologne
  - ◆ ❖ University Hospital of Leipzig
    - University Medical Center Lubeck
    - University of Munich
  - Urologie Oberkassel
  - Urologische Universitätsklinik Magdeburg
  - ◆ ♥ Urologische Universitätsklinik Heidelberg

- Urologisches Zentrum Neustadt
- Zentralklinik Bad Berka

#### Israel

- ○ ☆ ☆ Chaim Sheba Medical Center
  - ♦ ♦ ♦ Israel HIFU Ltd.
  - ♦ ♦ ♠ Normed
  - ♦ ♦ ۞ Ramat Aviv
    - Rambam Medical Center

#### Italy

- ◆ ♦ Alliance Medical, Italy
- Arco dell'Angelo
  - 🔷 😂 Azienda Ospedaliera A. Cardarelli
  - Azienda Ospedaliera 'Di Venere -Giovanni XXIII'
- ♦ ♦ Azienda Ospedaliera S. Maria degli Angeli
- ◆ ♦ Azienda Ospedaliera Universitaria di Parma
- Azienda Ospedaliera Universitaria Tor Vergata
- Azienda USL 1 Massa E Carrara
- ❖ ❖ ★ ❖ ★ Careggi General Hospital
- - 🔷 😂 🕏 Casa di Cura Abano Terme
    - ◆ ♦ Casa di Cura Columbus
    - ◆ ♥ Casa di Cura Rugani
- ❖ ❖ ※ ❖ ※ Cisanello Hospital of University of Pisa
- ●▼◆☆☆ ☆☆☆☆
  - crob irccs Rionero

#### In this region

Europe\*

#### Endocrine Disorders

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- Prostate cancer
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#### Russia Regional Oncology Dispensary of Tyumen Center of Family Planning & Reproduction Research Center for Obstetrics, Gynecology and Perinatology of Russian Ministry of Health and Social Development ❖ ❖ ❖ ❖ ● Central Institute of Traumatology and Orthopedics Rostov Scientific Research Institute of Oncology City Hospital No. 2 Russian Railways (RZD) Hospital Clinical Diagnostis Center Zdorovie Samara Oncoly Centre Ekaterinburg Regional Hospital N1/Ural Saratov City Medical Academy Medical University, Central Ural Region Sberbank Central Medical Center Sar Eastern Federal University St. Petersburg Oncology Dispanser Gazprom Medical Centre, Omsk West The I.M. Sechenov Moscow Medical Siberia Region Academy (MMA) Hospital of Veterans of War Ufa Oncology Center Khanty-Mansiysk Regional Hospital Spain North Siberia CINAC HM Puerta del Sur Main Military Clinical Burdenko's Hospital **\* ○ \* ○ ♦** Clínica Santa Elena 💠 🗘 🗶 🔵 Medical Center of Central Bank of **♦ ۞ ۞ ☆** Russian Federation Clínica Virgen Blanca S.A. Military Medical Academy St. Petersburg 💠 🗘 💢 🔵 Hospital Universitari Mutua Terrassa **▼ ♦ ۞ ۞ ☆** Moscow City Clinical Hospital Botkin Moscow Regional Research and ♦ ♦ ★ IMEX Clinical Institute 🕽 😂 😭 Instituto Cartuja de Técnicas Avanzadas Moscow Roszdrav Medical Center en Medicina ❖ ❖ ❖ ❖ ● National Medical Surgery Center Policlínica San Antonio **▼ ♦ ۞ ۞ ☆** ResoFus - Centre Medic Alomar ♦ ₩ NII of Urology ů N. N. Petrov Research Institute of Oncology Orenbourg Oncology Center

## In this region

Europe\*

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Thyroid nodules

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- Uterine fibroids

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

#### Sweden **United Kingdom** Basingstoke and North Hampshire Hospital 🔵 🗘 🛊 Karolinska University Hospital Uppsala University Hospital вмі The Hampshire Clinic Candover Suite Basingstoke Switzerland 💠 🗘 💢 🔵 Churchill Hospital Center for Ultrasound Functional **♦ ۞ ۞ ☆** Neurosurgery ◆ ☼ сни de Genêve Sing's College Hospital CHUV de Lausanne 🛕 💠 London Breast Clinic 😂 🏚 Clinique de Montchoisi Nuada Medical Clinique Generale Beaulieu Princess Grace Hospital se Eoc - Ospedale Regionale di Bellinzona Spire Parkway Hospital St. Mary's Hospital Fus-Center, University of Zurich, ☼ The Cromwell Hospital Children's Hospital The Institute of Cancer Research ◆ **②** Geneva University Hospital The Priory Hospital Hopital de Nyon The Winterbourne Hospital ☼ Inselspital - Universitaetsspital Bern University College London Hospitals Kantonsspital Baden \* Kantonsspital Winterthur University Hospital Zurich Turkey 🛕 😭 Penta Elektronik Medikal Sistemler Ankara **Ukraine ♦ ۞ ۞ ☆**

#### In this region

Europe\*

#### **Endocrine Disorders**

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Asia

#### China

♦ ♦ ★ ♦ Commerial treatment centers♦ ♦ ♦ ♦ ♦ for six indications

307 Hospital of PLA

Affiliated Hospital of Armed Police's Medical College Affiliated Hospital of Chuanbei Medical College Affiliated Hospital of Qinghai Medical College Affiliated Hospital of Xinxiang Medical College Baoji Maternal and Child Health Hospital

**Beijing Cancer Hospital** 

Beijing Hospital

Chengdu Shuangnan Hospital

Children's Hospital of Chongqing Medical University

Chongqing Three Gorges Central Hospital City Hospital of Bincheng District in Binzhou City

Dalian Friendship Hospital

Daxian People's Hospital Dengfeng People's Hospital

Fifth People's Hospital of Nanchong City

First Affiliated Hospital of Guangxi Medical University

First Affiliated Hospital of Kunming Medical University
First Maternal and Child Health Hospital of Shanghai

Fujian Provincial Hospital

Fuling Center Hospital of Chongqing

Fundan University Shanghai Cancer Center

Guangzhou First Municipal People's Hospital

Guantao People's Hospital of Hebei

Haifu Hospital

Haifu Hospital of Tangshan Transportation Group Co. Ltd

Haikou Municipal Hospital

Huabei Oil Field General Hospital Group

Huainan Eastern Hospital Huanggang Center Hospital Hubei Maternal and Child Health Hospital
Institute of Ultrasonic Engineering in Medicine and

Clinical Centre for Tumour Therapy

Jiangmen Wuyi Traditional Chinese Medicine Hospital

Jiangsu Armed Police Corps Hospital

Jiangsu Cancer Hospital

Jilin Center Hospital

Jiugang Hospital

Jiujiang Maternal and Child Health Hospital

Jixi People's Hospital

Kaixian People's Hospital

Lianyungang Orient Hospital

Liaoning Fushun Cancer Hospital

Luoyang Center Hospital

Maternal and Child Health Hospital of Yubei District

Nanshi Hospital

No. 91 Central Hospital of the People's Liberation Army

Nong Ken Hospital

Obstetric Hospital of Changchun

People's Hospital of Hunan Province

People's Hospital of Nanchuan District

People's Hospital of Xingtai

PLA 301 Hospital (General Hospital of the People's

Liberation Army)

Shaanxi Maternal and Child Health Hospital

Shandong Cancer Hospital

Shandong Guangrao Traditional Chinese Medicine Hospital

Shandong Qianfoshan Hospital

Shanxi Traditional Chinese Medicine Hospital

Shenzhen Maternal and Child Health Center Hospital

Suining Central Hospital

Suining Hospital of Traditional Chinese Medicine

Sun Yat-Sen University Cancer Center

The 452nd PLA Hospital

The Daqing Oil Field General Hospital Group

#### In this region Asia\*

## Endocrine Disorders Thyroid nodules

#### Gastrointestinal

- Liver cancer
- Pancreatic cancer

#### Miscellaneous

- Soft tissue cancer
- Soft tissue tumors, benign

#### Musculoskeletal

- Bone metastases
- Osteoid osteoma

#### Neurological

- Essential tremor
- Parkinson's disease

#### Oncological

- Bone metastases
- Breast cancer
- Kidney cancer
- Liver cancer

- Pancreatic cancer
- Prostate cancer
- Soft tissue cancer

#### Pain

Osteoid osteoma

#### Urological

- Benign prostatic hyperplasia
- Kidney cancer
- Prostate cancer

#### Women's Health

- 🕏 Breast cancer
- Breast fibroadenoma
- Uterine adenomyosis
- tterine fibroids

<sup>\*</sup>Indications not being researched in a region have been removed from the key.

Henan Linying County Hospital of Traditional

## Commercial Treatment Sites by Region

The First Affiliated Hospital of Chongqing Medical University
The First Affiliated Hospital of Wannan Medical College
The First People's Hospital of Shijiazhuang
The Fourth People's Hospital of Shenzhen
The Second Affiliated Hospital Of Hebei Medical University
The Second Artillery General Hospital of Chinese PLA
The Sixth People's Hospital of Neijiang
The Tenth People's Hospital of Shanghai
The Third Xiangya Hospital of Central South University
West China Hospital, Sichuan University
Xiaoshan Birth Control Station
Xijing Hospital of The Fourth Military Medical University
Yanbian Tianquan Hospital
Yongchuan Maternal and Child Health Hospital
Zibo Municipal Maternal & Children Health Hospital

Commerial treatment centers for two indications

Baicheng Central Hospital
Chongqing Jiangbei Hospital of Traditional
Chinese Medicine
Chongqing Kai County Maternal and Child Health Hospital
Chongqing Tongliang County People's Hospital
Dongguan Taiping People's Hospital
First Affiliated Hospital of Jinan University
First Affiliated Hospital of Nanchang University
First Affiliated Hospital of Nanjing Medical University
First People's Hospital of Guiyang
Foshan Chancheng District Central Hospital
Fuzhou Maternal and Child Health Hospital
Guangdong Maternal and Child Health Hospital
Guangdong Provicial Hospital of Traditional
Chinese Medicine

Guizhou Province Hospital of Traditional Chinese Medicine

Chinese Medicine Hezhe No. 2 People's Hospital Jiangsu Guanyun County People's Hospital Jiaxing Maternal and Child Health Hospital Jilin Ganan County People's Hospital Jinan Maternal and Child Health Hospital Jinzhou Central Hospital Kaifeng Tongxu County People's Hospital Lu'an Civily Hospital No. 2 People's Hospital of Guangzhou Peking University People's Hospital Qinghai Red Cross Hospital Qingyuan Maternal and Child Health Hospital Quanzhou Macare Hospital Quiing Qilin District People's Hospital Renji Hospital Ruzhou People's Hospital Shanghai Shuguang Hospital Shanxi Zhouzhi County People's Hospital Southern Medical University Tai'an Maternal and Child Health Hospital Taizhou Huangyan District Hospital of Traditional Chinese Medicine The Second Affiliated Hospital of Zhejiang University Weihai Central Hospital Wuhan Puren Hospital Xi'an Chang'an Hospital Xinjiang Korla Hospital Yichang No. 1 People's Hospital Yiyang Medical College Affiliated Hospital Zhangqiu Maternal and Child Health Hospital

Zhengzhou Hospital of Traditional Chinese Medicine

## In this region Asia\*

#### Endocrine Disorders

Thyroid nodules

#### Gastrointestinal

- Liver cancer
- Pancreatic cancer

#### Miscellaneous

- Soft tissue cancer
- Soft tissue tumors, benign

#### Musculoskeletal

- Bone metastases
- Osteoid osteoma

#### Neurological

- Essential tremor
- Parkinson's disease

#### Oncological

- Bone metastases
- Breast cancer
- Kidney cancer
- Liver cancer

Pancreatic cancer

Zhejiang Quhan Hospital

Zhongshan Guangji Hospital

- Prostate cancer
- Soft tissue cancer

#### Pain

Osteoid osteoma

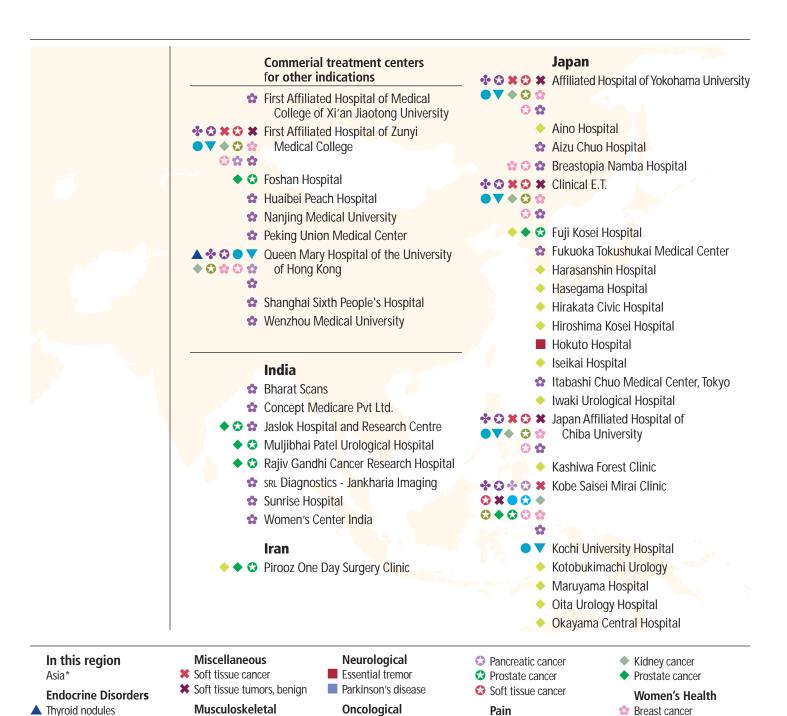
#### Urological

- Benign prostatic hyperplasia
- Kidney cancer
- Prostate cancer

#### Women's Health

- Breast cancer
- Breast fibroadenoma
- Uterine adenomyosis
- Uterine fibroids

<sup>\*</sup>Indications not being researched in a region have been removed from the key.



Bone metastases

Breast cancer

Kidney cancer

Liver cancer

Osteoid osteoma

Benign prostatic hyperplasia

Urological

Breast fibroadenoma

Uterine adenomyosis

Uterine fibroids

Commercial treatment sites provide treatment with a focused ultrasound system for a regulatory approved indication.

Bone metastases

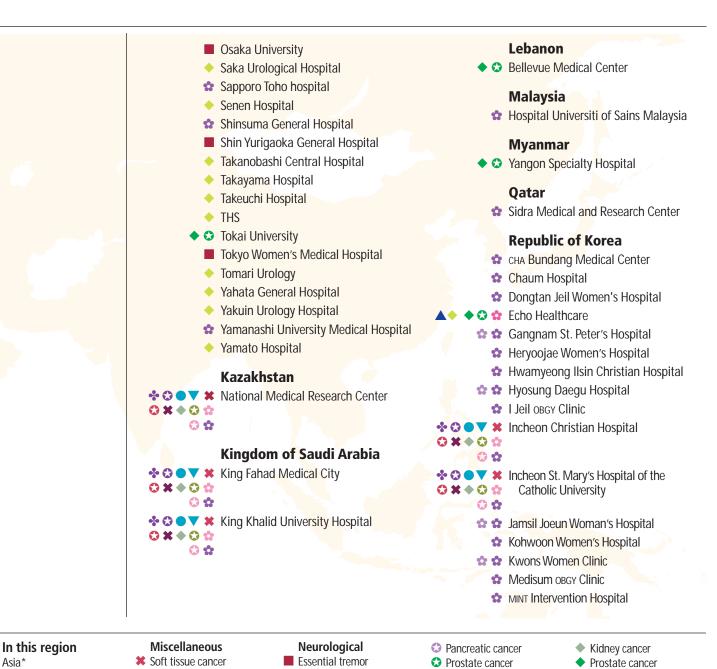
Osteoid osteoma

Gastrointestinal

Liver cancer

Pancreatic cancer

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Parkinson's disease

**Oncological** 

Bone metastases

Breast cancer

Kidney cancer Pancreatic cancer Liver cancer

\* Soft tissue tumors, benign

Musculoskeletal

Bone metastases

Osteoid osteoma

Asia\*

**Endocrine Disorders** 

Thyroid nodules

Liver cancer

Gastrointestinal

Benign prostatic hyperplasia

Soft tissue cancer

Osteoid osteoma

Urological

**Pain** 

Women's Health

Breast fibroadenoma

Uterine adenomyosis

Breast cancer

Uterine fibroids

Commercial treatment sites provide treatment with a focused ultrasound system for a regulatory approved indication. \*Indications not being researched in a region have been removed from the key.

- Mizmoa Women's Clinic
- ◆ ❖ Samsung Medical Center
- 🗘 🕏 Uijeongbu St. Peter's Hospital
  - Yonsei University Health System
  - YUMC Severance Hospital

#### Singapore

KK Women and Children's Hospital

#### **Taiwan**

- 🔵 🗯 🏗 Cardinal Tien Hospital
  - 🔷 😂 Chang Gung Memorial Hospital (Chiayi)
  - ◆ ❖ Chang Gung Memorial Hospital (Kaohsiung)
  - ◆ ❖ Chang Gung Memorial Hospital (Linkou)
  - ◆ ♦ Chang Gung Memorial Hospital (Taipei)
  - ◆ ♦ Changhua Christian Hospital
  - ◆ ♦ China Medical University Beigang Hospital
  - China Medical University Hospital
  - Dermacare
  - E-Da Hospital
  - Saoshiung Veterans General Hospital
  - 🔷 😂 Mackay Mem<mark>ori</mark>al Hosp<mark>i</mark>tal
  - ◆ ◆ National Defense Medical Center
  - 🔷 😂 New Taipei C<mark>ity</mark> Ho<mark>spit</mark>al Banciao Br<mark>anch</mark>
  - New Taipei City Hospital Sanchong Branch
  - ◆ ♦ Show Chwan Memorial Hospital
  - Taichung Veterans General Hospital
  - 🔵 🗘 Taipei Medical University Hospital

#### **Thailand**

- ❖ ❖ ◆ ◆ ❖ Chularat 9 Airport Hospital

  - Samitivej Sukhumvit Hospital

#### **United Arab Emirates**

Al Zahra Hospital

#### **Uzbekistan**

♦ Samarkand Urology Center

#### **Vietnam**

- Bao Son Hospital
- Phuc An Khang Hospital

## In this region

Asia\*

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- Breast cancer
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<sup>\*</sup>Indications not being researched in a region have been removed from the key.

## 2 Oceania

#### Australia

- Future Medical Imaging Group
- The Royal Women's Hospital Melbourne

## 3 Africa

#### **Egypt**

- 🛕 💠 EgyHiFu
- ◆ ❖ Teachers Hospital Cairo

#### Morocco

◆ ➡ Hopital Militaire Med V.

#### In these regions Oceania\* Africa\*

#### Endocrine Disorders

▲ Thyroid nodules

#### Oncological

Prostate cancer

#### Urological

Prostate cancer

#### Women's Health

- Breast fibroadenoma
- Uterine fibroids

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## COMMERCIAL TREATMENT

## Cost of Focused Ultrasound Compared to Standard of Care\*

#### **Back pain & neck pain** | 82 million patients

	<u> </u>
Physical therapy	\$50-400 per session
Surgery	\$24,000-100,000
Transcutaneous electrical nerve stimulation	\$10–300
Steroid injections	\$2,000
Medication	\$2,000 per year
Focused Ultrasound	n/a

#### **Bone metastases** | 280,000 patients

Surgery	n/a
Radiation therapy	\$8,000
Chemotherapy	\$24,000–100,000
Radiotherapy	\$15,000
Medication (pain & steroid)	\$12,000 per year
Focused Ultrasound	\$4,000–20,000

#### Breast cancer | 2,800,000 patients

Mastectomy	\$15,000–50,000
Radiation	\$20,000
Lumpectomy	\$7,000–20,000
Chemotherapy	\$30,000
Focused Ultrasound	n/a

#### **Breast fibroadenoma** | 24,000,000 patients

Surgery	\$15,000-50,000
Frequent U/S monitoring	\$20,000
Cryoablation	\$7,000–20,000
Focused Ultrasound	n/a

#### **Depression** | 15,000,000 patients

Medication	\$360–2,000 per year
Electroconvulsive therapy	\$25,000
Psychotherapy	\$3,000–13,000 per year
Vagus nerve stimulation	\$5,000–30,000
Transcranial magnetic stimulation (TMS)	\$15,000
Focused Ultrasound	n/a

#### **Essential tremor** | 10,000,000 patients

Physical therapy	\$50–400 per session
Medication	\$300 per year
Deep brain stimulation	\$30,000-50,000
Stereotactic radiosurgery	\$40,000
Focused Ultrasound	\$22,000-46,000

#### Glaucoma | 3,000,000 patients

Medication per year	\$35–4,000 per year
Surgery	\$1,000
Focused Ultrasound	\$1,000

#### **Kidney cancer** | 500,000 patients

Surgery	\$15,000–500,000
Radiofrequency ablation	\$3,000–5000
Cryoablation	n/a
Arterial embolization	\$800–27,000
Focused Ultrasound	n/a

Patient numbers reflect the prevalence of each indication in the U.S. n/a = information currently unavailable

<sup>\*</sup>Standard treatment costs are averages based on US pricing and meant to be used as a reference tool only. Costs for the same health care service can vary a great deal by geographic location and health care provider.

## Cost of Focused Ultrasound Compared to Standard of Care\*

#### **Liver cancer** | 67,000 patients

Surgery	\$23,000–100,000
Chemotherapy	\$30,000
Thermal ablation	n/a
Chemo embolization	\$800–27,000
Radiation	\$25,000
Immunotherapy	n/a
Cryosurgery	n/a
Focused Ultrasound	n/a

#### **Neuropathic pain** | 20,000,000 patients

Medication	\$150–60,000 per year
Electrical stimulation	\$24,000
Physical therapy	\$50-400 per session
Psychotherapy	\$150–200 per session
Focused Ultrasound	n/a

#### **Obsessive-compulsive disorder** | 3,300,000 patients

Medication	\$150–60,000 per year
Cognitive behavior therapy	\$3,000–13,000 per year
Psychotherapy	\$150–200 per session
Focused Ultrasound	n/a

#### Osteoid osteoma | 80,000 patients

Medication	\$150–24,000 per year
Curettage	\$3,000
Radiofrequency ablation	\$7,000
Focused Ultrasound	\$20,000

#### Pancreatic cancer | 50,000 patients

Surgery	\$40,000–85,000
Radiation	\$25,000
Chemotherapy	\$24,000–54,000
Focused Ultrasound	n/a

#### Parkinson's disease | 1,000,000 patients

Medication	\$2,500 per year
Deep brain stimulation	\$35,000-100,000
Focused Ultrasound	\$22,000

#### **Prostate cancer** | 138,000 patients

Surgery	\$12,000
Radiation (office or HOPD)	\$38,000
Chemotherapy	\$7,000 – 30,000
Cryotherapy	\$12,000
Focused Ultrasound	\$25,000

#### **Soft tisssue cancer** | 600,000 patients

Surgery	\$9,000–13,000
Radiation	\$25,000
Chemotherapy	\$2,000
Focused Ultrasound	\$20,000

#### Thyroid nodules | 15,000,000 patients

Medication	\$1,000 per year
Surgery	\$15,000
Radioactive iodine	\$4,000
Focused Ultrasound	\$3,000

#### **Uterine adenomyosis** | 15 million patients

Medication	\$200–6,000 per year
Uterine artery embolization	\$21,000
Endometrial ablation	\$3,000–6,000
Focused Ultrasound	\$4,000–9,000

#### **Uterine fibroid** | 13,600,000 patients

Hysterectomy	\$17,000
Myomectomy	\$19,000
Uterine artery embolization	\$21,000
Endometrial ablation	\$13,000
Focused Ultrasound	\$4,000–14,000

<sup>\*</sup>Standard treatment costs are averages based on US pricing and meant to be used as a reference tool only. Costs for the same health care service can vary a great deal by geographic location and health care provider.

#### **FOCUSED ULTRASOUND FOUNDATION**

#### Cumulative Focused Ultrasound Foundation Activities

#### CREATE KNOWLEDGE

206
patients
treated in
29 clinical trials

\$6.8M spent on completed projects

\$33.2M secured in follow-on funding

## FOSTER COLLABORATION

5 symposia

53 external meetings

21 workshops

15 communities

3 international databases

to engage stakeholders and build communities

#### **INCREASE AWARENESS**

**578** media placements

112

AGGREGATE & SHARE KNOWLEDGE

28,600 newsletter subscribers

**387,000** website visits in 2016

#### **OVERCOME BARRIERS**

3

reimbursement workshops

18

working groups

CULTIVATE THE NEXT GENERATION

98

14

fellows

## Foundation newsletter distribution and website traffic at an all-time high

The Focused Ultrasound Foundation has seen a steady increase in our newsletter distribution (page 59, top left) and website visits (page 59, top right) since its founding in 2006.

At the beginning of 2016, the Foundation released a short book by board member John Grisham called *The Tumor*. This publication has been distributed to over 800,000 people in just over one year. It has created an explosion of awareness as seen in the 2016 numbers for website visits and newsletter distribution, which have both more than doubled from the previous year (page 59, top).

## Addition of virtual attendance platform more than doubles symposium attendance

The numbers of Focused Ultrasound Foundation Symposium attendees and presentations at our biennial meeting (page 59, bottom left) have steadily increased over the years and the

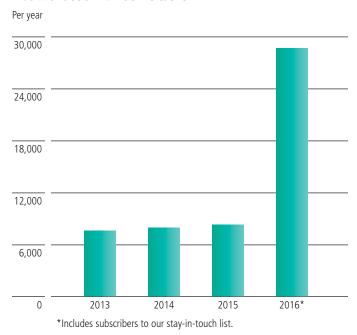
Foundation continues to be considered a leader in the field by fostering collaboration among researchers, manufacturers, doctors, and patient organizations. In 2016, for the first time the Symposium offered a live-streaming option for the plenary sessions. Over 400 people from across the world registered to watch the Symposium online.

## Cumulative funding increases impact of donations fivefold

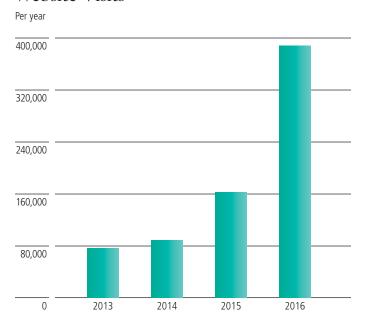
Since its establishment in 2006, the Focused Ultrasound Foundation has become the largest nongovernmental source of funding for focused ultrasound research (page 59, bottom right). The Foundation has awarded 6.8 million dollars to date in completed research projects which have resulted in 33.2 million dollars in follow-on funding, a 5:1 ratio for investment.

## **FOCUSED ULTRASOUND FOUNDATION**

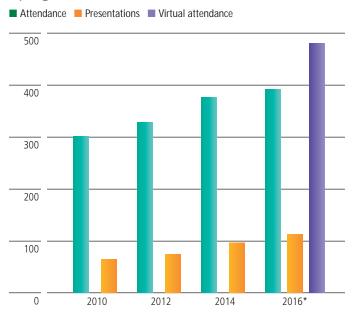
## Focused Ultrasound Foundation Newsletter Distribution



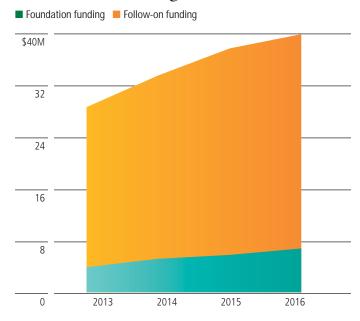
## Focused Ultrasound Foundation Website Visits



## Focused Ultrasound Foundation Symposium Attendance and Presentations

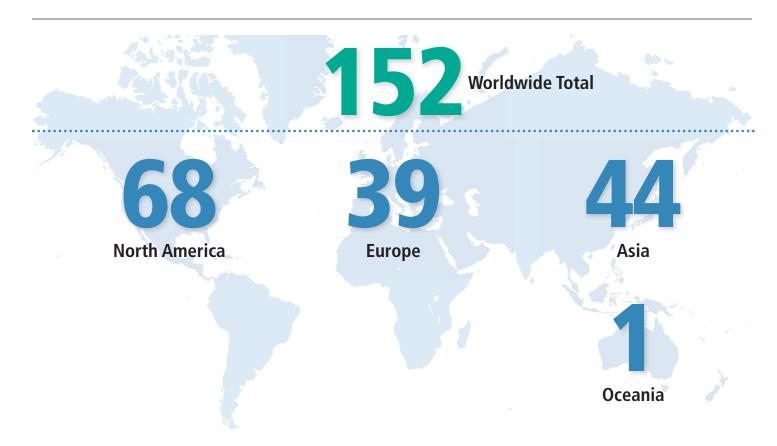


## Focused Ultrasound Foundation Cumulative Funding



## **BIOEFFECTS RESEARCH**

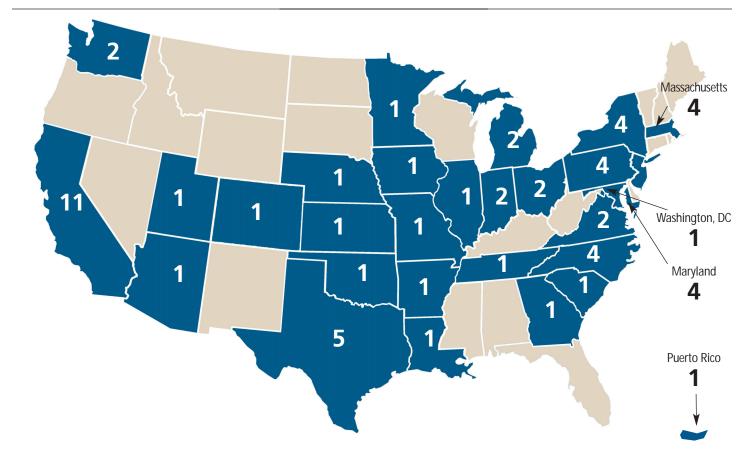
## All Bioeffects Research Sites by Region

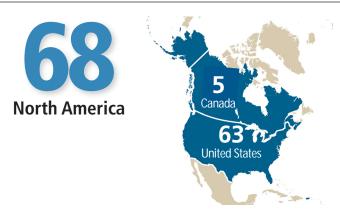


Bioeffects research sites are any site investigating how focused ultrasound interacts with the body.

Bioeffects Research Sites in North America

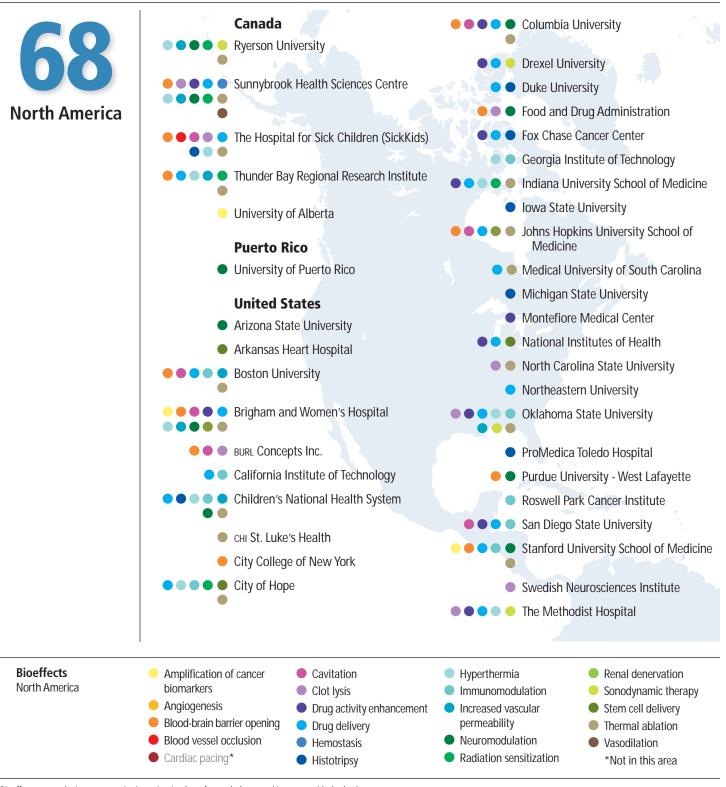






#### **BIOEFFECTS RESEARCH**

#### Bioeffects Research Sites By Region



Bioeffects research sites are any site investigating how focused ultrasound interacts with the body.

#### Bioeffects Research Sites By Region

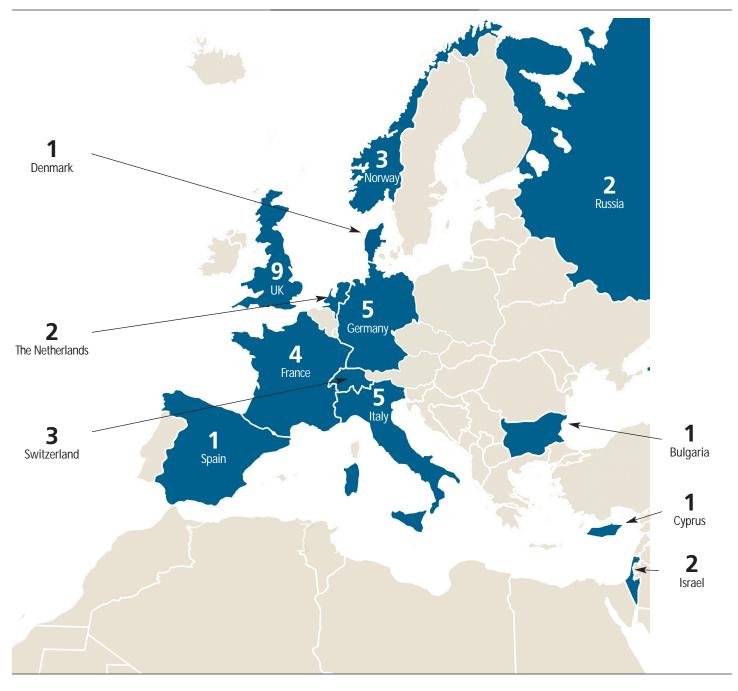


Bioeffects research sites are any site investigating how focused ultrasound interacts with the body.

## BIOEFFECTS RESEARCH

## Bioeffects Research Sites in Europe





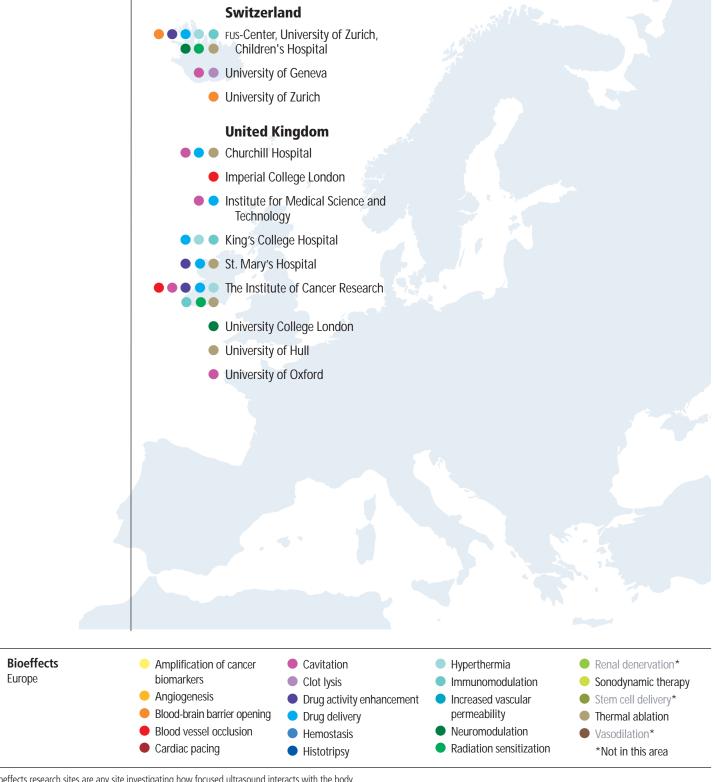
## Bioeffects Research Sites by Region



Bioeffects research sites are any site investigating how focused ultrasound interacts with the body.

## **BIOEFFECTS RESEARCH**

## Bioeffects Research Sites by Region

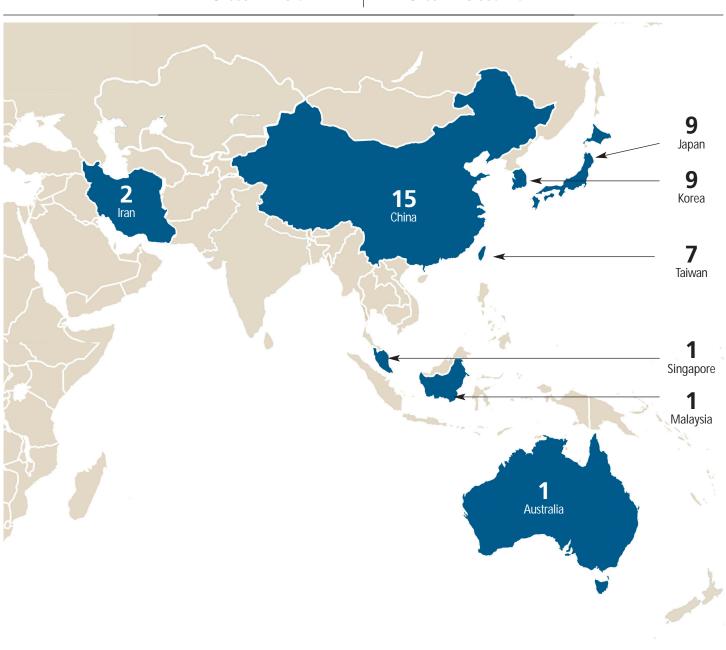


Bioeffects research sites are any site investigating how focused ultrasound interacts with the body.

Bioeffects Research Sites in Asia and Oceania







#### Bioeffects Research Sites by Region

Asia

#### **China**

- **Beijing Normal University**
- **Chongqing Medical University** 
  - First Affiliated Hospital of Nanjing Medical University
  - First Affiliated Hospital of Shihezi University
  - Nanjing Medical University
  - Peking Union Hospital, Chinese Academy of Medical Sciences
  - Shenzhen Institutes of Advanced Technology - Chinese Academy of Science
    - Shenzhen University
    - Southern Medical University
    - Sun Yat-Sen University
  - The Third Xiangya Hospital of Central South University
  - The University of Hong Kong
  - Third Military Medical University
  - Wenzhou Medical University
  - Xi'an Jiaotong University

#### Iran

- Iran University of Medical Sciences
  - Islamic Azad University

#### **Japan**

- Fukuoka University School of Medicine
- Hokuto Hospital
- Kobe Saisei Mirai Clini
- Kochi University Hospital
  - National Center of Neurology and Psychiatry
- Teikyo University
- Tohoku University
- Tokyo University of Pharmacy and Life Sciences
- Washokai Sadamoto Hospital

#### Malaysia

University of Malaya

#### Republic of Korea

- Asan Medical Center
- **Chonnam National University**
- Daegu-Gyeongbuk Medical Innovation Foundation (DGMIF)
- **Ewha Womans University Medical Center**
- Korea Institute of Science and Technology
- Samsung Advanced Institute of Technology
- Sogang University
- The Catholic University of Korea
- YUMC Severance Hospital

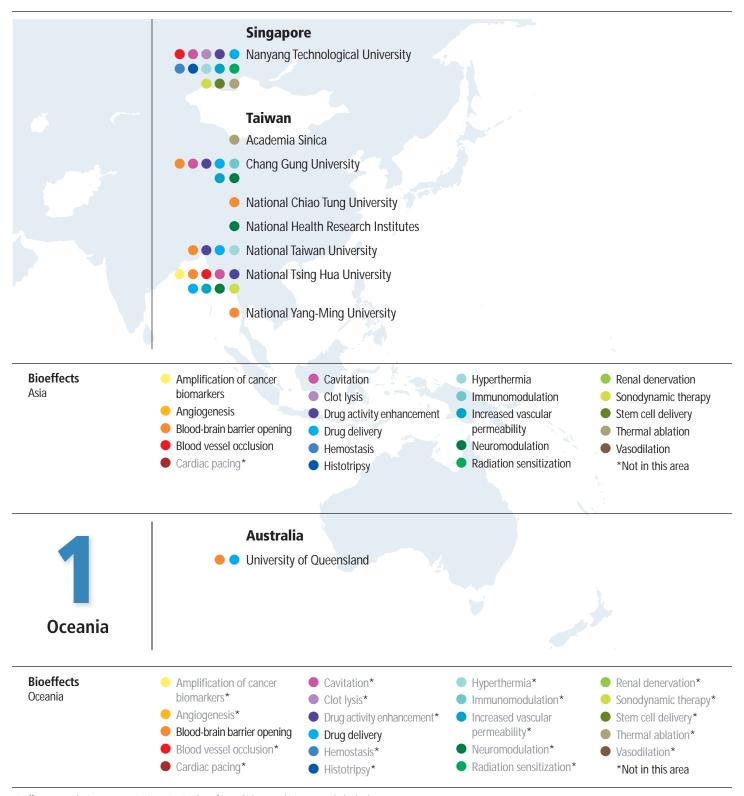
#### **Bioeffects** Asia

- Amplification of cancer biomarkers
- Angiogenesis
- Blood-brain barrier opening
- Blood vessel occlusion
- Cardiac pacing\*
- Cavitation
- Clot lysis
- Drug activity enhancement
- Drug delivery
- Hemostasis
- Histotripsy

- Hyperthermia
- Immunomodulation Increased vascular
- permeability Neuromodulation
- Radiation sensitization
- Renal denervation
- Sonodynamic therapy
- Stem cell delivery
- Thermal ablation
- Vasodilation
  - \*Not in this area

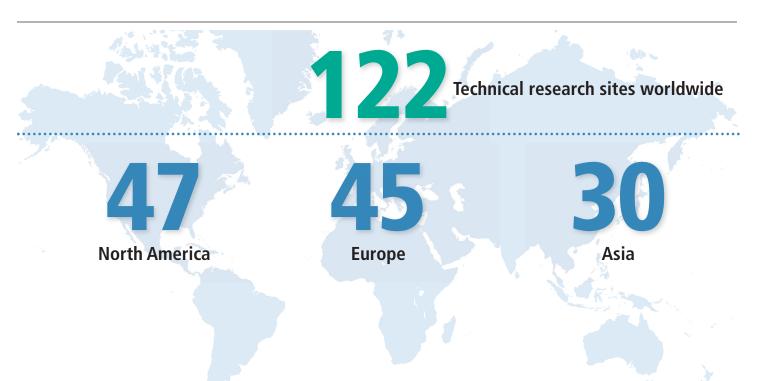
Bioleffects research sites are any site investigating how focused ultrasound interacts with the body.

## Bioeffects Research Sites by Region



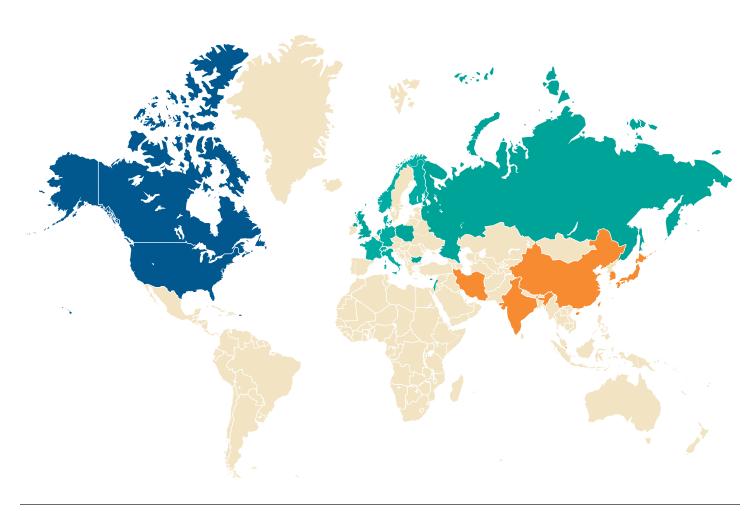
Bioeffects research sites are any site investigating how focused ultrasound interacts with the body.

## All Technical Research Sites by Region



Technical research sites are any site investigating hardware or software solutions related to focused ultrasound.

## All Technical Research Sites by Region



Technical research sites are any site investigating hardware or software solutions related to focused ultrasound.

#### ■ North America

- 4 Canada
- 43 United States

#### Europe

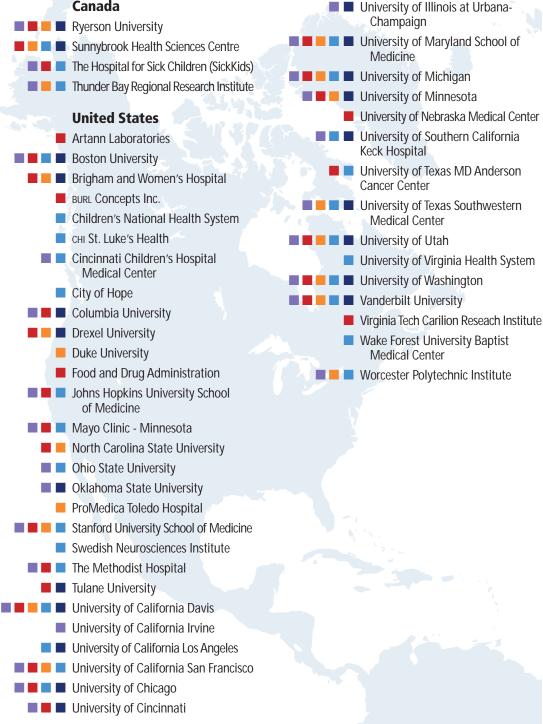
- 1 Bulgaria
- 1 Cyprus
- 1 Denmark
- 1 Finland
- 5 France
- 9 Germany
- 2 Israel
- 7 Italy
- 2 The Netherlands
- 2 Norway
- 2 Poland
- 1 Russia
- 3 Switzerland
- 8 United Kingdom

#### Asia

- 10 China
- 1 India
- 1 Iran
- 8 Japan
- 5 Republic of Korea
- 1 Singapore
- 4 Taiwan

## Technical Research Sites by Region





Technical research sites are any site investigating hardware or software solutions related to focused ultrasound.

## Technical Research Sites by Region



## Technical Research Sites by Region



Technical research sites are any site investigating hardware or software solutions related to focused ultrasound.

#### Manufacturers Contact Information

#### Acublate

London, UK
n/a WEBSITE
n/a EMAIL

#### **Alpinion Medical Systems**

Seoul, Korea www.alpinion.com website therapeutic@alpinion.com email

#### Beijing Yuande Bio-Medical Engineering

Beijing, China www.yuande.com website contact@yuande.com email

#### BrainSonix

Sherman Oaks, California www.brainsonix.com WEBSITE sasha@brainsonix.com EMAIL

#### CarThera

Paris, France www.carthera.eu website contact@carthera.eu email

## Changjiangyuan Technology Development Co., LTD

Shenyang, China www.cjykj.com/en/ website sales@cjykj.com email

## Chongqing Haifu Medical Technology Co., LTD

Chongqing, China www.haifu.com.cn/en\_index.asp website sales@hifu.cn EMAIL

#### **EDAP TMS S.A**

Vaulx-en-Velin, France www.edap-tms.com website www.edap-tms.com/en/contact EMAIL

#### **EpiSonica**

Hsichu City, Taiwan www.episonica.com website info@episonica.com email

#### **EyeTechCare**

Rillieux-la-Pape, France www.eyetechcare.com/en/ website www.eyetechcare.com/en/footer/contact/ EMAIL

#### **FUS Instruments Inc.**

Toronto, Canada www.fusinstruments.com website info@fusinstruments.com email

#### **FUS Mobile**

Alpharetta, Georgia www.fusmobile.com website info@fusmobile.com email

#### HistoSonics, Inc.

Ann Arbor, Michigan www.histosonics.com website info@histosonics.com email

#### Image Guided Therapy (IGT)

Pessac, France www.imageguidedtherapy.com WEBSITE www.imageguidedtherapy.com/Contact-Us/ EMAIL

#### **Imasonic**

Voray-sur-l'Ognon, France www.imasonic.com WEBSITE www.imasonic.com/Company/ContactUs.php

#### **INSIGHTEC LTD**

Tirat Carmel, Israel www.insightec.com website www.insightec.com/about-us/contact-us EMAIL

#### **International Cardio Corporation, LLC**

Minnetonka, Minnesota www.hifu-rx.com website dlsellke@gmail.com EMAIL

#### **Kona Medical**

Bellevue, Washington www.konamedical.com website info@konamedical.com email

#### **Medsonic LTD**

Limassol, Cyprus www.medsonic.com.cy website info.medsonic@gmail.com EMAIL

#### **Mianyang Sonic (SUONIKE) Electronic**

Mianyang, China www.ultrasound.cn/en/ website mail@ultrasound.cn EMAIL

#### **Mirabilis Medical**

Bothell, Washington
www.mirabilismedical.com website
info@mirabilismedical.com FMAII

#### **NaviFUS**

New Taipei City, Taiwan n/a website n/a email

#### **Philips Healthcare**

Eindhoven, The Netherlands www.philips.co.uk/healthcare/product/HC781360 /sonalleve-mrhifu-therapy-platform website healthcare@philips.com EMAIL

#### **Profound Medical Inc.**

Toronto, Canada www.profoundmedical.com website info@profoundmedical.com email

#### **Promedica Bioelectronics**

Rome, Italy www.promedicasrl.eu/en/sonowell-4.html WEBSITE info@promedicasrl.eu EMAIL

#### Shanghai A&S Co., LTD

Shanghai, China www.aishen.com.cn/english/ website aishen@aishen.com.cn EMAIL

## Shenzhen PRO-HIFU Medical Tech. Co., LTD

Shenzhen, China en.pro-hifu.com/index.html website promethe@pro-hifu.com EMAIL

#### Shenzhen Wikkon

Shenzhen, China www.eswl.cn/en/ website export@eswl.cn EMAIL

#### SonaCare Medical, LLC

Charlotte, North Carolina
www.sonacaremedical.com WEBSITE
Info@sonacaremedical.com EMAIL

#### **Sonic Concepts**

Bothell, Washington www.sonicconcepts.com website info@sonicconcepts.com email

#### **Sumo Corporations**

Kowloon, Hong Kong www.sumo.com.hk website info@sumo.com.hk email

#### **Supersonic Imagine**

Aix-en-Provence, France www.supersonicimagine.com website contact@supersonicimagine.fr email

#### Theraclion

Malakoff, France www.theraclion.com WEBSITE contact@theraclion.com EMAIL

#### Verasonics

Redmond, Washington www.verasonics.com WEBSITE info@verasonics.com EMAIL

#### **Wuxi Haiying Medical**

Wuxi, China
www.haiyingmedical.com.cn website
hytrade@haiying.com.cn email

#### **FOCUSED ULTRASOUND FOUNDATION**

The Focused Ultrasound Foundation wishes to thank its exceptional Board of Directors and Council for their steadfast dedication to helping make focused ultrasound a clinical reality and improve the lives of millions of patients.

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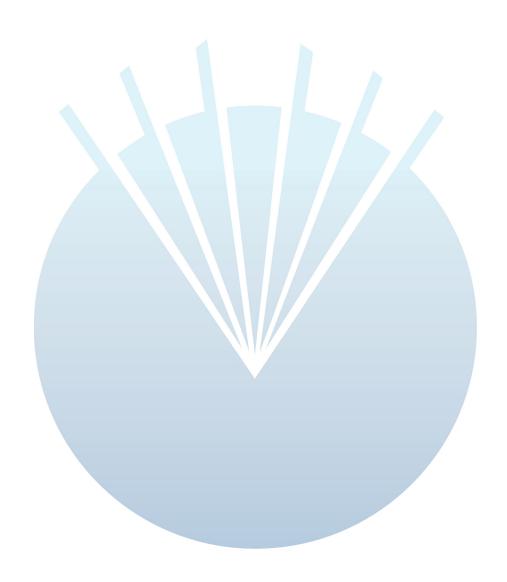
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#### www.fusfoundation.org

Contact

#### **Diana Villalobos**

Director of Global Relations dvillalobos@fusfoundation.org EMAIL 434.326.9833 DIRECT LINE

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