

Barrow MR-guided Focused Ultrasound Program



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Welcome to the Barrow MR-Guided Focused Ultrasound Program

We are pleased that you have chosen the Barrow MR-Guided Focused Ultrasound Program for your care. Barrow Neurological Institute is committed to providing excellence in clinical care and patient satisfaction, which is based upon our high standard of excellence in personalized health care.

We assembled this handbook to provide information about focused ultrasound and to help reduce your concerns about the unknown. Should you decide focused ultrasound is right for you, your care will be provided by an experienced, trained neurosurgeon along with a team of dedicated nurses, MRI technicians, and clinical coordinators. We hope you find this handbook helpful.

Meet Our Team



Francisco Ponce, MD
Neurosurgeon
Director, Barrow DBS &
Focused Ultrasound Program



Cindy McElfresh
Program Manager
Barrow DBS & Focused
Ultrasound Program

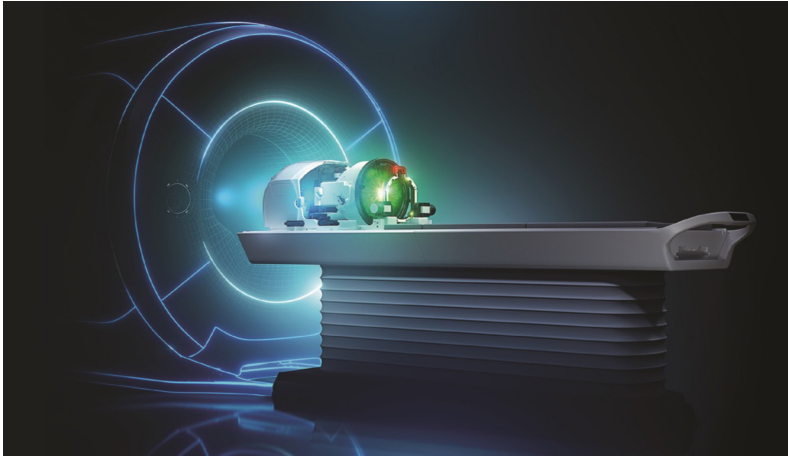


Magdalena Anzaldúa, MA
Administrative Assistant
Lead Care Coordinator

MR-Guided Focused Ultrasound

What is MR-guided focused ultrasound?

MR-guided focused ultrasound is an incisionless, minimally invasive treatment that provides tremor control for patients with medication-refractory tremors. Focused ultrasound was FDA approved for unilateral treatment of essential tremor in 2016 and for tremor-dominant Parkinson's disease in 2018. In 2022, the FDA approved staged bilateral treatment of essential tremor. The second side can be treated nine months after the initial treatment date.



How does it work?

Focused ultrasound is done in an MRI scanner in the radiology department at St. Joseph's Hospital and Medical Center. High-intensity ultrasound waves that are guided by MRI images are used to plan and guide the treatment. During treatment, ultrasound waves are focused on a specific area in the brain (the ventral intermediate nucleus of the thalamus) to create a small ablation or burn.

Who is a candidate for focused ultrasound?

To be considered as a candidate for focused ultrasound, you must meet the following criteria:

- You have been given a diagnosis of essential tremor (ET) or tremor-dominant Parkinson's disease by a neurologist or movement disorder specialist
- You have essential tremor and have tried at least two trials of medications, commonly including primidone and propranolol
- You have moderate to severe tremor of the dominant hand that interferes with your activities of daily living
- You meet the required age, which is 22 or older for patients with essential tremor and 30 or older for patients with tremor-dominant Parkinson's disease
- You are not a candidate for DBS (deep brain stimulation) - i.e., advanced age, blood thinners, surgical comorbidities, or have failed DBS and had the DBS system removed

Contraindications for Focused Ultrasound

- Any metal implants such as pacemakers that are not MRI compatible, metal clips, stimulators, cochlear implants
- Claustrophobic or not able to tolerate being in a stationary position for a prolonged period during treatment (typically about 90 minutes)
- Unstable health-related issues such as a recent heart attack, congestive heart failure, or spinal condition (may need surgical clearance from treating physician)

Any metallic implants must be MRI safe to prevent injury to the patient from the MRI's strong magnetic field. If you have any questions, you will need to consult with your doctor to see if this treatment is a possibility for you.

Getting Ready for Focused Ultrasound

CT Head Scan

During the evaluation process, you will be required to obtain a specific non-contrast CT head scan to evaluate your skull density. Not all patients have skull densities that are right for focused ultrasound. Certain skull shapes and thickness may make it impossible for ultrasound energy to raise the temperature at the target needed for treatment. If you are not a candidate for MRgFUS, other treatment options may be considered.

Blood Thinners

You will be asked to stop blood thinners or anti-inflammatory medications before the procedure; this will depend on individual circumstances and will be discussed with you prior to the procedure. Clearance from the prescribing physician will also be required.

Haircut

Your head will be completely shaved for this treatment. You will be asked to cut your hair as close to the scalp as possible prior to treatment day. At the hospital, the nurse will use a rotary razor to fully shave your head before treatment begins.

Food

There is about a 2% risk that you may vomit during the procedure. If this occurs, we will stop the procedure. While it is OK for you to eat on the day of treatment, some may choose not to eat due to this possibility.

Tremor Medicine

Do not take pills that will suppress your tremor the night before or morning of treatment. The surgeon would like to see your tremor and see the improvement after the procedure.

Transportation

You **MUST** have a ride to and from the procedure. You will **NOT** be permitted to drive home after.

Treatment Day

Patients are asked to check in at St. Joseph's Hospital and Medical Center in Main Admitting. Please arrive at your assigned time. Be sure to have your insurance information with you for check-in.



Family members are welcome to accompany you to the MRI suite while you are being prepped for the procedure. When treatment is ready to begin, they will be escorted to the waiting area until treatment is over.

It is recommended that you wear loose, comfortable clothing on treatment day. You will NOT be asked to change into a hospital gown for this procedure. However, one will be provided upon request. We also recommend that you dress warmly. Warm blankets are provided during treatment.

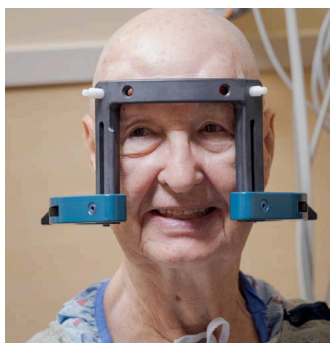
No IVs are given during treatment, and there are no anesthesiologists present.

You will be asked to remove all jewelry, dentures, contact lenses, eyeglasses, and hearing aids. Absolutely no metal.

A pre-procedure writing sample will be obtained using the hand to be treated.

Frame Placement

After your head has been shaved, a local anesthetic will be injected into your scalp to numb the four sites where the frame will be secured to your head. Pain medication will be given during frame placement to minimize discomfort. You will also receive a dose of oral steroids. A silicone membrane/bladder is stretched and pulled over your head like a tight headband. A “time-out” is taken to review and verify the plan of treatment. You are then escorted to the MRI scanner.



MRI Setup

The team will lay you flat on the MRI table and lock the frame to the bed. Cushioning and padding will be placed for comfort. The team will fill the membrane that is around your head with cold water. A helmet-like hemispheric transducer will then be fitted to the frame and then you will undergo a planning MRI. Adjustments are made to position the helmet to center the ablation target. You will be given a “stop treatment” ball to squeeze if you are unable to continue with the treatment. The surgeon will then obtain a second baseline spiral from you. Once the surgeon has completed the planning steps, the treatment will begin.



Treatment

Low doses of energy (or sonication) are applied to confirm that the point identified on the planning MRI is the point that heats when energy is applied. A medium dose sonication is then applied to temporarily stun the brain tissue and verify that impairment of the targeted area relieves tremor without side effects, with adjustments being made as needed. Higher-dose sonications are then given to create the ablation. Once treatment is complete, the cold water is drained from the silicone membrane/bladder and the frame is removed. A final spiral test is performed, and then you will be discharged.

MRgFUS Complications

Focused ultrasound has been proven to be safe for treatment of essential tremor and tremor-dominant Parkinson's disease with minimal risk. However, as with any medical procedure, there are risks. You are encouraged to have a conversation with your physician regarding potential complications or adverse events that could occur.

Recovery, Expectations, and Precautions:

- Head is completely shaved for this treatment
- Procedure is done in an MRI scanner on an outpatient basis, meaning patients go home the same day
- 70-75% improvement in tremor control (but does not improve any other motor symptoms that may occur in tremor-dominant Parkinson's patients)
- No anesthesia; you will be awake
- It is normal to feel unsteady for a period of time after this procedure. It is recommended you have a walker, cane, or wheelchair to assist with balance.
- You may feel numbness/tingling of your tongue, lips, hand, or fingers after treatment. This is a possible side effect and should improve with time.
- You may feel nauseated. Medication (Zofran) will be given prior to the treatment to help with this.
- Steroids will be administered pre-procedure as well as post-procedure to help with swelling near the ablation site.
- During treatment, you may have some heating at the skull with some discomfort.
- **Wound care:** There will be four points on your scalp where the pins were placed—above the eyebrows and behind the ears. Band-Aids and ointment will be placed on those areas. You may remove these and shower the day after.
- **Driving:** You are required to have a companion drive you to and from the procedure. You may not drive for two weeks.
- **Follow-up Appointment:** Your follow-up appointment with the surgeon will be three to four weeks after the day of treatment. Follow-up with the neurologist will be at their discretion.



Insurance Coverage

Insurance Coverage (in Arizona) for the Diagnosis of Essential Tremor

- Medicare
- Medicare Advantage Plans
- Aetna
- Blue Cross Blue Shield of Arizona
- Cigna
- Humana

Insurance Coverage (in Arizona) for the Diagnosis of Tremor-Dominant Parkinson's Disease

- Medicare
- Medicare Advantage Plans

Important Numbers

Cindy McElfresh, Program Manager

(602) 406-3865

Dr. Ponce's Office

(602) 406-3242

St. Joseph's Hospital Radiology Scheduling

(602) 406-6700

St. Joseph's Hospital Admitting

(602) 406-6560

Resources

Barrow FUS Program

BarrowNeuro.org

BarrowBrainandSpine.com

Or call (602) 406-3865

The Muhammad Ali Parkinson Center

BarrowNeuro.org/MAPC

Or call (602) 406-4921

International Essential Tremor Foundation

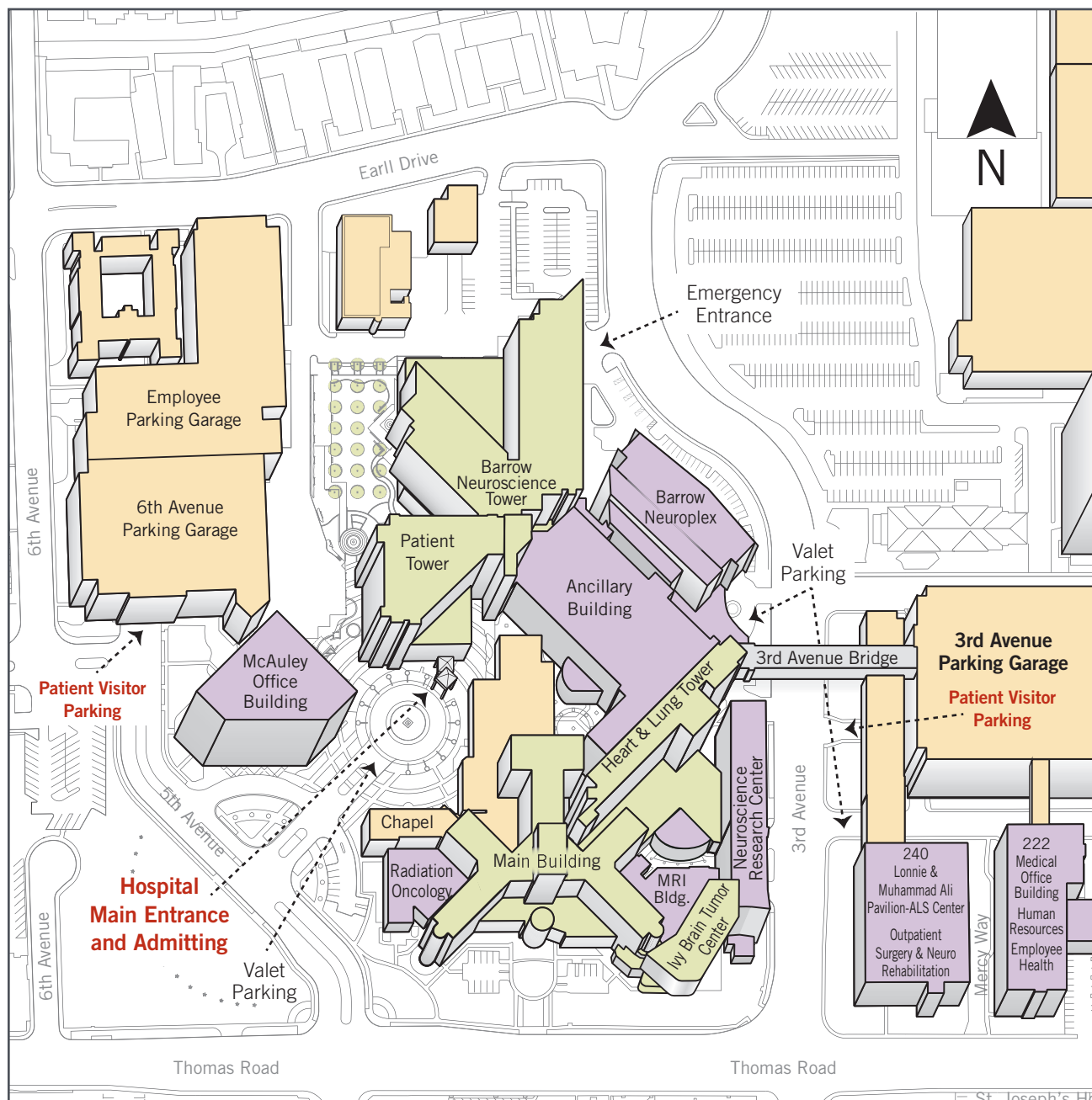
EssentialTremor.org

Parkinson and Movement Disorders Alliance (PMDA)

PMDAlliance.org



Campus Map



Hotels Near St. Joseph's Hospital:

Hampton Inn Phoenix

160 West Catalina Drive, Phoenix AZ 85013

(602) 200-0990

**On the campus of St. Joseph's Hospital

Ramada Inn

212 West Osborn Road, Phoenix AZ 85013

(602) 892-1531

Extended Stay America

217 West Osborn Road, Phoenix AZ 85013

(602) 279-9000

Embassy Suites by Hilton

10 East Thomas Road, Phoenix AZ 85012

(602) 222-1111

Fairfield Inn & Suites Phoenix

2520 North Central Avenue, Phoenix AZ 85004

(602) 716-9900

Wyndham Garden Phoenix

3600 Second Avenue, Phoenix AZ 85013

(602) 604-4900



BarrowNeuro.org

