

MR Focused Ultrasound

About Your Procedure



Johnston-Willis Hospital

Brain & Spine Center

HCA*Va*

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What is MR Focused Ultrasound?



MR focused ultrasound is a minimally invasive procedure for the treatment of Essential Tremor and Parkinson's disease related tremors. It uses high-intensity ultrasound energy, guided by magnetic resonance imaging (MRI) to heat an exceedingly small, targeted area of the brain treating the tremor. This procedure does not involve any significant radiation.

Prior to the Procedure

- A video or in-person consultation will be arranged with the neurosurgeon. Patients are educated about the procedure by the nurse practitioner. During this session, patients and family members will have the opportunity to ask questions.
- CT Scan and MRI of the brain would be ordered.
- Instructions will be given to discontinue Essential Tremor medications the night before the procedure, except for Propranolol which should not be discontinued.
- If you are on a blood thinner you will be advised to stop taking it two days before the procedure with approval of your prescribing doctor.



- Patients are advised not to eat or drink anything after midnight before the procedure.



The Day of the Procedure

- This is an outpatient procedure. You will be assigned a private suite and a very experienced nurse will be with you throughout the procedure. Your family member will be updated during the day of treatment.
- An IV will be placed and you will receive an antibiotic, nausea medication, and any other necessary medications.
- Your head will be shaved by your nurse. This allows the Ultrasound to work properly.
- Numbing medication will be applied to your scalp and a head frame will be secured. The frame will remain in position during the procedure.
- An anesthesiologist will be present to administer medications if needed. This procedure does not require general anesthesia. You **will NOT** be put to sleep.
- After the completion of the frame placement patients are taken to the MRI Suite. There a silicon membrane will be placed on your head that will circulate cool water. This will minimize potential heating near the scalp.



- You will lie flat on your back on a dedicated bed in the MRI suite. If you have difficulty lying flat, please inform your neurosurgeon during the initial consultation.
- You must be awake during the process and be able to communicate with the treatment team.

The procedure will be guided by the neurosurgeon and his team working together outside the MRI room where you are being closely monitored by the entire team of treatment planning.

Your nurse will be with you throughout the procedure, monitoring your blood pressure, heart rate, and well-being and providing you with warm blankets since the room can get quite cold.



The MRI imaging enables the neurosurgeon to locate and fine-tune the area that needs to be treated. Small doses of ultrasound energy will be given as a test to help confirm the proper location.

- The treatment team will be in and out of the MRI suite monitoring and testing you on several occasions. They will ask you questions and have you perform simple tasks such as speaking, writing or to pretend you are drinking from a bottle of water. They may also ask you to do other tasks which may provoke your tremors.
- Once the neurosurgeon and the team are confident of the location, the focused ultrasound energy will be increased to make further improvement in your tremor. In most cases immediate results are noticeable.
- When the procedure is complete you will leave the MRI treatment area and return to your suite. The head frame will be removed and pain medication will be given



if needed. You will be able to have something to eat and drink at this point.

- An MRI scan is done upon completion of the treatment.
- Patients are discharged from the hospital same day after the treatment. A responsible adult must be available to drive the patient home.
- Discharge instructions are reviewed.



Procedure Completion

- A follow-up visit is arranged with the neurosurgeon for about two weeks after the procedure.



- An MRI would be ordered for four months after the procedure. This MRI can be done at a center close to your home if you are not residing in Richmond, Virginia. You may request a video consult or an office visit after the MRI to discuss the results.

Occasionally some patients may have trouble with balance, dizziness, numbness, or tingling. These effects usually are transient and improve with time. Always stay in touch with your neurosurgeon's office.

Frequently Asked Questions

What is focus ultrasound and am I a candidate for this procedure?

This is a procedure done as an outpatient. No incision and no implants are involved. Almost 1,000 sound waves with MRI guidance are used to converge on an exceedingly small area in the brain (thalamus) responsible for the tremors. This procedure will be offered to you only if you have already tried medications and did not get satisfactory relief.

Why do I have to have a frame put on?

The frame ensures that your head does not move during the treatment. Once your head is fixed with the frame the area in the brain undergoing treatment becomes a fixed target. This ensures the safety and accuracy of treating the target in the brain.

Is there a possibility of missing the target?



The possibility is exceedingly rare because MR imaging allows the treating physician to continuously see the treatment area and monitor the temperature. Additionally, continuous testing is done with low temperatures to identify the target before making the final lesion.

How safe are these ultrasound beams for the rest of the brain?

Each individual beam passes harmlessly through the brain but only where they all converge in the thalamus does the

temperature rise, creating a lesion disrupting the area responsible for tremors. The rest of the brain is safe.

What side effects can I expect during or after the treatment?

Some patients occasionally may experience nausea, pain or other sensations during the procedure. Nurses and doctors are always there to take care of you. A small percentage of patients may experience some numbness or balance issues after the procedure. These are usually transient side effects and should get better with time and therapy.



Why do I have to be awake during the procedure and what kind of results should I expect?

During the procedure, your doctors will keep testing you to check your tremors. This is done by asking you to do different tasks such as saluting or pretending to drink from a bottle of a water. You will be asked also to draw spirals so they can determine the results of the treatment. Upon completion of the procedure most patients would experience good resolution of their tremors. Some patients may take a few weeks to obtain maximum benefit of the procedure.

Will my tremor return?

There is the possibility that your tremor may return months or even years after the treatment. Your physicians will monitor you and offer alternate options if needed.



If you have questions or concerns prior to your procedure, contact our navigator, Denise Laine, at **(804) 483-5711** or janet.laine@hcahealthcare.com.

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