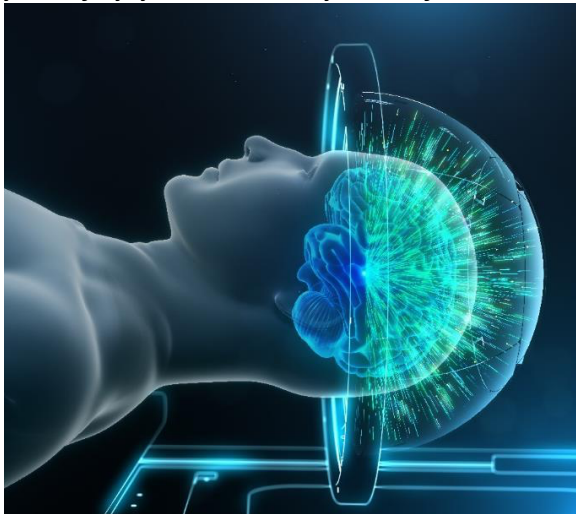




## MRI guided Focused Ultrasound Preoperative Information and Guide

### Information and a description of the MRgFUS Procedure

MRI guided focused ultrasound or FUS/HIFU is an incisionless method to treat tremor and some symptoms of Parkinson's disease. Using an array of ultrasound emitting elements precisely targeted to an area of the brain these symptoms are decreased or alleviated completely. This an out-patient procedure, you go home the same day. It requires only local anesthesia, but you do need a total head shave for the procedure. This guide is to help prepare you for the surgery. There is no way we can predict exactly how the surgery will go, but we hope to prepare you for what to expect. This should help answer some questions and calm some fears. It is OK to be somewhat fearful of any operation, especially one involving your brain. **Remember, your safety is the most important thing to our team. We put you first: your safety, your results and your comfort.**



### Evaluation

Initially, you need to be evaluated to determine if you are a good candidate. The diagnosis of Parkinson's Disease or Essential tremor should be confirmed by a neurologist. If your tremor or Parkinson's Disease symptoms are not being adequately controlled with medication you might be a candidate for MRgFUS. After the diagnosis is confirmed a special scan is needed to ensure the procedure can be done safely. This CT or CAT scan of the head will be used to measure your **skull density ratio** or **SDR**. We will order the imaging study and give you an instruction sheet for the imaging facility to make sure the images

are obtained correctly. This value will determine how well the ultrasound waves penetrate the skull. Once the images are obtained, please supply us a CD rom with the images. We will process them to determine the SDR. SDR values below 0.4 are more difficult to treat and this may exclude you from the procedure. Once these hurdles are passed you can move forward with the procedure if you wish.



### Things You need to know

Using sound waves through the skin and skull to treat your condition requires a total head shave. During the procedure your head is bathed in water and any air bubble can disrupt the procedure. The water itself is "degassed" to prevent air bubbles. However, your hair can trap air bubbles and therefore we need to do a thorough head shave prior to treatment. We will ask you to go to a barber and have a very close if not complete head shave. This is helpful, but we will still closely shave you the day of the procedure. The hair will grow back.

We place you in a **stereotactic frame**. This device is used to hold your head still and to provide a very precise way for us to target the area for treatment. This is rigidly fixed to your head and is placed on you with local anesthesia. Any discomfort from putting the frame on quickly dissipates. In addition to using local anesthesia, we will give you medication for nausea. Some people experience a feeling of motion sickness during the procedure, the medication will help. The whole procedure is done in the MRI scanner. We will be talking to you and checking in with you frequently. **MRgFUS** is an "ablative" procedure. That means that the target area is heated to the point where the cells causing the symptoms of your condition are destroyed. This is irreversible. But before we do the permanent treatment we will test you with lower energy treatments. These "tests" improve treatment benefits while decreasing the risk of side effects.

The procedure takes about 2 hours from start to finish with roughly one hour in the MRI scanner. The remainder of the time is spent preparing you for the operation. Even though we do not use anything other



than local anesthesia, you must have a driver to get you home. Most people feel very unsteady after the procedure and we do not allow our patients to drive for at least 10 days afterward. The unsteadiness does improve but it takes time. Other side effects might include numbness or tingling in the finger tips/hand and an altered sense of taste. Most of these symptoms gradually resolve in 6 weeks. But the targeted symptoms improve immediately.

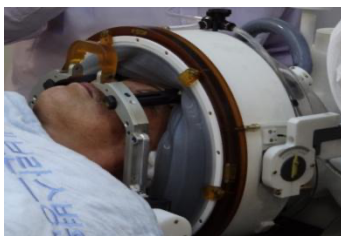
### The Procedure

You will arrive at the facility and you will be checked in by the staff. After changing into a hospital gown an intravenous catheter will be placed. This allows us to give you any medications that might be needed. We usually give an anti-nausea medication prior to the procedure. We will then complete the head shave and place the stereotactic frame and silicone membrane. A last-minute trip to the restroom



before placing the frame is a good idea. Once you are in the scanner we can't take you out without interrupting the

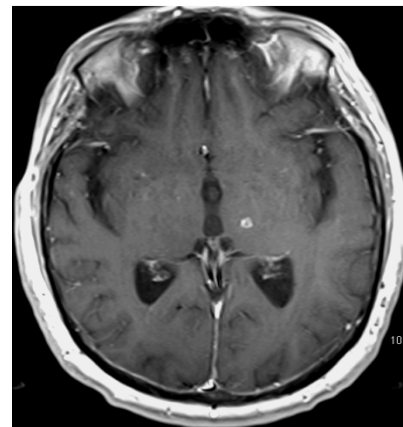
whole procedure. Local anesthetic is used to numb the scalp during the frame placement. Next, we take you to the MRI scanner. We assist you onto the table where you are made comfortable for the procedure. The silicone membrane and frame will be fixed to the helmet. The helmet contains the ultrasound emitting elements. You will feel your scalp cool as we fill the helmet with water. After the helmet is filled and all the air bubbles are removed we will start the procedure.



We will do several scans to find the exact location that we need to treat. Once the location has been determined we will start the treatment. You will be given a button that allows you to stop the process. This button temporarily halts the procedure. Only press the button if you are uncomfortable or experience something that feels unpleasant. If you have questions we can talk to you between scans and sonications.

The treatment begins with "test sonications." These are lower energy and will deactivate the area producing symptoms such as tremor. After a test we will come in and check on you. We will make sure that the symptoms are improving and that you are having little to no side effects. After a successful test sonication, we will start the treatment.

The treatment will use higher energy than the test. People often experience a sensation that they are falling backwards. Some have even described it as floating or flying. Each time we do a treatment we will check on you and adjust the treatment location as needed. The whole process includes anywhere from 3-5 treatments. Once the treatment is completed we take you out of the MRI scanner. The membrane and frame are removed, and you will be taken to the recovery area.



### Discharge

In the recovery area you will be given discharge instructions. Please, no driving for at least 10 days. There is no need for pain medication but please call the office, 301-718-9611, if you have any questions or concerns after the treatment. Common symptoms after the procedure include unsteadiness when walking, tingling/numbness in the finger tips, changes taste, and some people report some discoordination of the hand. These should all slowly resolve in time. You should come and see the surgeon for a postoperative appointment in two weeks, and we will order an MRI of the brain. This scan is to confirm lesion location and size.



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### Last Things

There are no guarantees with any surgical procedure. The goal of MRgFUS is to improve your day to day activity and functionality. It is not a cure for movement disorders such as tremor or Parkinson's Disease. Some symptoms may return and an additional procedure may be needed. Even though there is no incision, that does not mean this treatment is risk free. Complications are rare but can occur. Permanent unsteadiness, numbness or even weakness has been seen with this procedure. It is our goal to keep you safe and improve your quality of life.

Remember to tell us if you have any metal implants or neurostimulators or pacemakers. These devices are often MRI compatible. However, you will need to bring your controller to the hospital so we can place you into an MRI safe mode. If you take blood thinners, these may be held or the dose changed around the time of treatment. We will communicate with your doctor to determine what is best.

Your safety and comfort are our concern as well as yours. We want to make sure that any concerns and any questions are addressed.

**Please call with any questions or concerns.**

**(301) 718-9611**

**Or use the Privia Portal to reach out.**