

# How Rush University Medical Center is transforming neurosurgical care – Insights from 4 physician leaders

For many patients, the daily suffering from debilitating conditions like essential tremor and tremor-dominant Parkinson's disease has become an all too familiar and unwelcomed way of life. For years, medications and invasive surgeries have been their main or primary treatment options.

However, since 2016, a revolutionary innovation by Insightec has helped to quietly transform patient lives all over the world. Using acoustic energy, hospitals and neurosurgeons are helping to transform patient care by using focused ultrasound to precisely and effectively treat deep inside the brain in a single outpatient procedure.

*Becker's Hospital Review* recently spoke with four leaders at Rush University Medical Center in Chicago about this groundbreaking technology:

- K. Ranga Rama Krishnan, MB, ChB, CEO, Rush University System for Health
- Richard Byrne, MD, Chairman, Department of Neurosurgery
- Sepehr Sani, MD, Director, Stereotactic Functional Neurosurgery
- Leo Verhagen Metman, MD, PhD, Director, Movement Disorder Interventional Program

These leaders discussed the role innovative technology is playing in transforming care in their organization, described how focused ultrasound has enhanced the patient experience in neurosciences and shared their perspectives on the future of neuroscience care and innovation.

## **Strategic investments in technology require constant environmental scanning**

When Rush University Medical Center evaluates its strategic investments in technology, a single overarching goal guides the team: to deliver the best possible care to all patients. That means having the right cutting edge capabilities, the right workforce, and the ability to provide the right treatment in the right place at the right time.

The leadership team focuses on blending research, education, and clinical expertise in such a way that the organization is continuously learning about new innovations. Of particular interest are technologies that target the five clinical areas where Rush University Medical Center strives to be a market leader: neurosciences, cancer, bone and joint diseases, cardiac conditions, and metabolic disease.

"We are constantly looking over the horizon and examining new technologies that the FDA will be reviewing over the next six months to two years that could add value to our patients," Dr. Krishnan said. "Focused ultrasound was one of those innovations."

Once the FDA approves a promising new treatment, the team determines the right time to bring it into the organization. A series of questions steers this evaluation process, such as: Does the innovation address a problem or patient need that isn't adequately being addressed today? Can Rush University Medical Center create a sustainable practice around a focused ultrasound program? And, does staff already exist within the Rush system to support the technology, such as, in the case of focused ultrasound, Dr. Sani and Dr. Verhagen?

"As a neurologist at a premier movement disorder center, I knew that we should have focused ultrasound for our patients," Dr. Verhagen said. "We are very excited that in just one year, a particularly challenging year, 50 essential tremor patients received this innovative treatment."

### **Focused ultrasound can be life changing for essential tremor and tremor-dominant Parkinson's patients**

In 2016, Exablate Neuro became the first and only focused ultrasound platform to receive FDA approval to treat medication-refractory essential tremor, and in 2020 nationwide Medicare coverage

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for the procedure was received. After reviewing the clinical data, market potential and business opportunity, Rush University Medical Center's neuroscience service line decided to proceed with the strategic investment in the Exablate Neuro platform. In March 2020, Rush University Medical Center launched its focused ultrasound program.

The Exablate Neuro platform provides an incisionless, anesthesia-free, outpatient treatment approach. Rather than working in an operating room with a scalpel, neurosurgeons perform the focused ultrasound treatment from the control room of an MRI suite equipped with nothing more than a computer, keyboard, and mouse. The procedure can have immediate therapeutic effect, often leaving patients, family members and healthcare workers in tears of joy.



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**Sepehr Sani, MD,  
Director, Stereotactic  
Functional Neurosurgery**

“It’s all about the patients,” said Maurice R. Ferré MD, Chair and CEO of Insightec. “Our technology offers neuroscience leaders the opportunity to help transform the lives of people living with debilitating hand tremor and return to living an independent and productive life.”

The procedure has minimal complications, little to no risk of infection and has attracted a patient population that has been delaying treatment for years, maybe decades, waiting for something new. Focused ultrasound has become a preferred treatment choice for many patients for whom medications have not provided satisfactory tremor improvement because it does not require surgical incisions, typically only takes a few hours, and has very little follow-up or maintenance afterwards. The most common post-treatment side effects reported by subjects in Insightec-sponsored clinical studies included imbalance/gait disturbance, numbness/tingling and headache/head pain. As with all medical procedures, there is risk for long-term effects.

“In general, these are very well-informed individuals who know about all the treatment modalities, including surgical interventions that have been around for decades,” Dr. Sani said. “They have made a conscious choice that they would never undergo an invasive procedure and would simply live with the condition. Insightec has delivered a major paradigm shift, not just in terms of the technology, but also in terms of the value it adds to patient care.”

“Each patient is a unique individual,” Dr. Verhagen said. “I evaluate the severity of their tremor, the impact it has on their life, as well as discuss their expectations from treatment. Focused ultrasound is a good treatment option for a large group of patients that have no other option available.”

## **The key to successful focused ultrasound programs is a combination of technology, people and processes**

“You can’t launch a focused ultrasound program simply by buying the equipment; you need the right people with the right background who know how to use the technology. Dr. Sani and Dr. Verhagen have been working with tremor patients for a long time. They were the right people with the right interest,” Dr. Krishnan said.

Insightec’s collaboration is another factor that has contributed to the success of Rush University Medical Center’s focused ultrasound program. “Insightec provided their expertise that enabled us to build a roadmap to make it clinically and financially feasible to implement the treatment,” Dr. Krishnan said. “The solution is provided in a way that’s sustainable for both the short- and the long-term.”

“Hospitals face shifting priorities and challenges when adopting innovation while remaining focused on patient care,” Dr. Ferré said. “A focused ultrasound program may help strengthen the profile of the neuroscience program with a specialized service line for a patient population that is looking for treatment options.”

When asked about the biggest lesson learned from launching this focused ultrasound program, Dr. Sani emphasized the need for a well-planned and organized approach. To support the focused ultrasound program, Rush University Medical Center has created a set of administrative processes and protocols that deliver a positive patient experience.

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**Leo Verhagen Metman, MD,  
PhD, Director, Movement  
Disorder Interventional Program**



Staff members, not computers, answer a dedicated phone number and respond to all email messages within 24 hours. In addition, a dedicated program coordinator guides patients and interested referring physicians. To support patient evaluations, the team has developed a defined workflow. In some cases, the team can conduct those evaluations remotely – an important consideration given current concerns about COVID-19.

“If a patient does need to come to the office for a formal evaluation, we ensure that all the testing and assessments are completed in a single visit,” Dr. Sani said. “Having a streamlined approach to this treatment makes a real difference to patients. For us, that’s been a key factor in the success of the program.”

### **Looking ahead, focused ultrasound may be a viable treatment for additional indications**

While movement disorders like essential tremor and tremor-dominant Parkinson’s disease are established indications for focused ultrasound, experts agree that researchers have just started to scratch the surface of this technology’s potential.

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**Richard Byrne, MD,  
Chairman, Department  
of Neurosurgery**

“There is potential for expansion of the indications for focused ultrasound,” Dr. Byrne said. “We need to work through the research and participate in the research, but there’s more to come and we plan to be on the forefront of it going forward.”

Rush University Medical Center is committed to exploring how it can use this innovative technology to provide relief to patients. “The way I look at every innovation is to ask whether there’s a patient population that we can serve by bringing the technology in,” Dr. Krishnan said “If the answer is yes, it doesn’t matter how many other health systems are already offering the treatment. We should try to bring it into Rush.” ■