



Dr. Joseph J. Busch, Jr. at Busch Center in Alpharetta, Ga., USA

MR-guided non-invasive prostate cancer treatment

Busch Center pioneers in-bore treatment using MAGNETOM Skyra



Executive summary

Two longtime pioneers in oncology imaging, Dr. Joseph Busch and Siemens Healthineers, came together with an innovative medical technology company, Profound Medical, to establish a new TULSA Procedure™ (transurethral ultrasound ablation) center in Georgia, USA. The TULSA Procedure is a non-invasive, in-bore magnetic resonance imaging (MRI)-guided technique that enables the physician to selectively ablate cancerous or hypertrophic prostate tissue while preserving surrounding healthy tissue.

Modern MRI technology from Siemens Healthineers like the MAGNETOM Skyra delivers advanced MRI guidance enabling precision ablation through the TULSA Procedure. Integration of MAGNETOM scanners with third-party devices is enabled by Access-I, a commercial software solution from Siemens Healthineers. Working in partnership with clinicians and other medical technology companies, Siemens Healthineers is dedicated to expanding precision medicine by offering more personalized treatments for patients with cancer.

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Prostate cancer pioneers: Busch Center

Founded in 2019 by Joseph J. Busch Jr., MD, Busch Center in Alpharetta, Ga., specializes in diagnostic imaging, MR image-guided biopsy, and MR image-guided focal prostate cancer treatment. An oncologic radiologist and early adopter of MR imaging technology, Dr. Busch has come to view the MRI scanner bore as more than a source of high-resolution imaging. It has become a space for image-guided procedures.

Dr. Busch's experience with in-bore procedures started with prostate cancer biopsies. "Twelve-needle biopsies can miss cancers. But in-bore targeted prostate biopsies can locate even small cancers. That's great for the patient—it helps decrease their anxiety and worry because they can get same-day results from MRI

prostate scans," said Dr. Busch. Dr. Busch sees MRI as a vital part of delivering personalized care to his prostate cancer and benign prostate hypertrophy (BPH) patients. Modern MRI scanners have opened the door to targeted treatments with fewer complications than radical prostatectomy or whole-gland irradiation. "Thanks to this technology, we can detect prostate cancers sooner, and I can biopsy and eventually do a targeted outpatient treatment for a 3- or 4-millimeter cancer," Dr. Busch said.

[Click an image to reveal additional scans](#)

TRA plane

Sagittal plane



Siemens Healthineers MAGNETOM Skyra used at Busch Center

Focal prostate cancer treatment at Busch Center

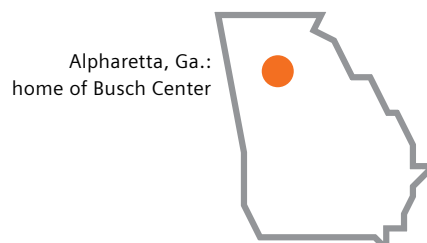
Busch Center is currently one of a small number of centers in the USA that performs focal laser ablation, an MRI-guided treatment that uses thermal energy from a laser light source to selectively kill cancerous tissue while sparing nearby healthy tissue.

More recently, Busch Center became the first clinic in Georgia to offer directional transurethral ultrasound ablation, known as the TULSA Procedure™, for treating prostate cancer and BPH. At Busch Center, the TULSA Procedure is performed within the bore of the MAGNETOM Skyra MRI from Siemens Healthineers. The TULSA Procedure allows the interventionalist to selectively target and ablate prostate tissue. Busch Center performs the TULSA Procedure on an outpatient basis, using managed or monitored anesthesia care in lieu of general anesthesia.

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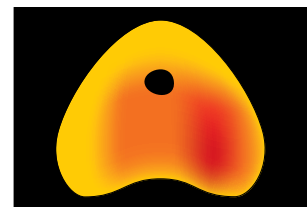
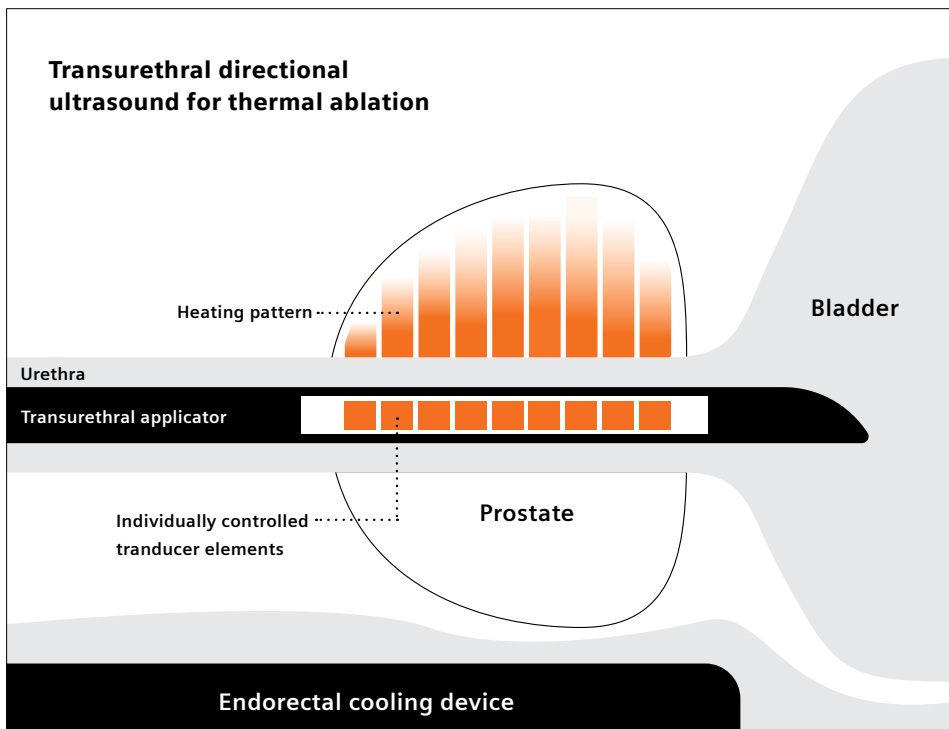
Busch Center's journey to the TULSA Procedure

In his quest to offer more personalized treatments and better outcomes for his patients with prostate cancer or BPH, Dr. Busch traveled to Radboud University Medical Center in Nijmegen, The Netherlands. There he learned about the TULSA Procedure firsthand from Professor Jurgen Fütterer, MD, PhD, a pioneer in the field. "I saw that the TULSA Procedure could replace a lot of radiation, and I thought about how I could build on what they were doing to make it even better for my practice. I saw that this could be a way to treat prostate cancer or BPH with precision and hopefully see better medical and quality-of-life outcomes," Dr. Busch said.



The TULSA Procedure™ uses the TULSA-PRO® system to integrate advanced MRI technology with robotically controlled incision-free thermal ultrasound technology. Busch Center chose the TULSA-PRO system from Profound Medical for its flexibility with TULSA Procedures. TULSA-PRO is designed to provide customizable and predictable ablation of a physician-defined region of prostate while actively protecting the urethra and rectum, to help preserve the patient’s natural functional abilities.

Arun Menawat, CEO of Profound Medical, explained how TULSA-PRO works in conjunction with modern MRI technology. “You get the thermometry from the MRI, and you have a temperature map of the prostate. TULSA-PRO takes that information and gently heats the tissue to 55 degrees Celsius, which kills the tissue,” he said. The high-resolution MR images coupled with precision temperature control allow focal treatment of diseased tissue while sparing surrounding tissue, for fewer complications and better preservation of sexual and urinary function.



Creating the temperature map of the prostate with thermometry from the MRI

Adapted with permission from Profound Medical

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Modern MRI technology enables TULSA Procedure™

Dr. Busch worked closely with the Profound Medical team to get the TULSA-PRO® system up and running at his center once the system was approved for use in the USA. He decided to pair the TULSA-PRO with the 3T MAGNETOM Skyra MRI scanner from Siemens Healthineers. “There are a lot of MRIs that can do nice T2 images, but the MAGNETOM Skyra stands out for its gradient imaging capabilities, and that’s what we need for TULSA,” Dr. Busch explained. “That gradient image — the Apparent Diffusion Coefficient (ADC) map image — is critical for diagnosing prostate cancer,” he continued. “We’re also using the ADC and diffusion weighted imaging (DWI) for live treatment planning.”

Busch Center uses the same MRI scanner for diagnosis and in-bore biopsy as well as for the TULSA Procedure™. The MAGNETOM Skyra offers multiparametric imaging for increased precision in diagnosis and rapid acquisition of high-resolution images for guiding ablation via the TULSA-PRO system.

The MAGNETOM Body18 (and higher channel count array coils) provides accuracy with high resolution and excellent spatial imaging, enables parallel imaging for speed, and eliminates the discomfort of an endorectal coil. This benefits the practice and the patient by giving the interventionalist greater confidence in performing the procedure and by minimizing treatment time. “We get improved image quality, faster scanning, and better patient comfort because you don’t need an endorectal coil,” Dr. Busch said.

Click each number for features and highlights.



Click to visit the
MAGNETOM Skyra web page

The power of partnership

Dr. Busch has long viewed Siemens Healthineers as a leader in imaging technology. But he also sees them as a partner. “They’re an engineering company that listens to the clinical side of things. And they do a great job of teaching clinicians how to use their scanners,” he said. “I actually learned about the TULSA-PRO® system through Siemens Healthineers,” he added.

Dr. Busch was also impressed with the healthy collaboration between Profound Medical and Siemens Healthineers. “They really worked great together, and with our people, to get this going. For example, there was an artifact early on in some cases, and they put their heads together to come up with a solution. And both companies have been really responsive in helping us fine-tune things on this end,” Dr. Busch said.



Conclusion

With non-invasive procedures like the TULSA Procedure™, the MRI scanner bore is becoming a procedure site. The Siemens Healthineers portfolio of MRI scanners can enable these high-precision treatments by offering a wide menu of imaging techniques and the ability to rapidly acquire high-resolution images.

Busch Center’s TULSA Procedure program is the result of strong partnerships between medical technology companies and clinicians. As patients and doctors demand more options for non-invasive treatments, the use of the MRI bore in image-guided procedures is likely to grow. The advantages demonstrated for focal ablation of prostate tissue with the TULSA Procedure may be extended to enable focal, personalized treatment of other disease states.

Siemens Healthineers is proud to support partnerships with clinicians and with other technology companies to foster innovation in cancer diagnosis and treatment, as seen with Busch Center and Profound Medical. We believe that expanding precision medicine through advanced imaging technology will make new, more personalized treatments and better outcomes a reality.

Learn more about our MRI solutions on the Siemens Healthineers website

At Siemens Healthineers, our purpose is to enable healthcare providers to increase value by empowering them on their journey toward expanding precision medicine, transforming care delivery, and improving patient experience, all enabled by digitalizing healthcare.

An estimated 5 million patients globally benefit every day from our innovative technologies and services in the areas of diagnostic and therapeutic imaging, laboratory diagnostics, and molecular medicine, as well as digital health and enterprise services.

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