< FUSION® ENT NAVIGATION SYSTEM: WEB CONTENT FOR CUSTOMER USE >

ENT Image-Guided Sinus Surgery

Fusion® ENT Navigation System from Medtronic

Many sinus operations occur near the brain, eyes, carotid artery, and other vulnerable structures. The Fusion® ENT Navigation System is an electromagnetic image-guided surgery (IGS) system that helps the surgeon avoid these areas by displaying 3D images of the patient's anatomy and the precise location of the surgeon's instruments within the anatomy. This information enables the surgeon to exercise greater caution or to continue as needed. Endoscopic sinus surgery with IGS is associated with a lower risk of complications in select patients compared to surgery without IGS.[1]

The Fusion System offers many benefits, including:

- **Superior, Reliable Accuracy.** Millimeters matter when operating near the brain and other areas. The Fusion System offers superior, reliable accuracy that surgeons and patients need.
- **Ease and Flexibility.** The Fusion System streamlines set-up and tracks multiple instruments in the anatomy at the same time. Surgeons can also customize and save their preferred settings.
- **Integrated Technologies.** Through built-in connectivity and integration with other Medtronic devices, the Fusion System provides added functionality and convenience during sinus surgery.
- **Advanced AxiEM™ Electromagnetic (EM) Navigation.** With proprietary EM tracking, Fusion eliminates line-of-sight issues, enables greater instrument flexibility, and constantly monitors the EM field to ensure navigation precision.

What Is Image-Guided Surgery?

Similar to a GPS device, an image-guided surgery (IGS) system provides a visual road map of each patient's unique anatomy, and allows surgeons to track the position of their instruments in the patient's sinuses at all times during surgery. It does not replace surgical skill or anatomical knowledge, but offers additional information for surgical decision-making.

Why Is It Used?

Sinus anatomy can be altered by disease, previous surgery, and normal anatomical variations. This can make it a challenge for surgeons to find anatomical landmarks — even with a detailed knowledge of anatomy and surgical skill.

Image-guided surgery has been used effectively since the mid-1990s, and has become an industry standard for many endoscopic sinus surgeries. The American Academy of Otolaryngology – Head and Neck Surgery (AAO-HNS) endorses the use of IGS in appropriate cases and gives these examples:[2]

- Revision sinus surgery
- Distorted sinus anatomy of development, postoperative, or traumatic origin
- Extensive sino-nasal polyposis
- Pathology involving the frontal, posterior ethmoid, and sphenoid sinuses
- Disease abutting the skull base, orbit, optic nerve, or carotid artery
- CSF rhinorrhea or conditions where there is a skull base defect

- Benign and malignant sino-nasal neoplasms

How Does It Work?

Before the procedure, the patient has a CT (computed tomography) scan of the sinuses. These images are transferred to the IGS system, allowing the surgeon to plan the best surgical approach for the operation. The IGS system correlates data from these CT scans with special sensors placed on the patient's head and the surgeon's instruments during the procedure. While the surgery is performed, 3D images of the patient's anatomy and the position of the surgeon's instruments are displayed in real time.

References

1. Dalgorf DM, Sacks R, Wormald PJ, et al. Image-guided surgery influences perioperative morbidity from endoscopic sinus surgery: a systematic review and meta-analysis. *Otolaryngol Head Neck Surg.* 15 May 2013. doi: 10.1177/0194599813488519. [Epub ahead of print]
2. American Academy of Otolaryngology - Head and Neck Surgery (AAO-HNS). Intra-Operative Use of Computer Aided Surgery. Statement approved 2002, revised 2005, and reaffirmed 2012. Accessed July 16, 2013.