

COMPASS INTERNATIONAL, PIONEER OF COMPUTER-ASSISTED, IMAGE-GUIDED NEUROSURGERY, INTRODUCES THE NEXT GENERATION CYGNUS PORTABLE FRAMELESS STEREOTACTIC SYSTEM

Compass International, Inc. (Rochester, MN), established in 1986, was one of the first companies to integrate computer navigation with image databases: CT, MR, and angiography. Compass International's multiple stereotactic systems enable any institution to offer innovative, life-saving technology and establish itself as a tertiary neurological surgery center. Compass International was the first company to adapt convenient, unobtrusive, no line-of-sight issues, and electromagnetic tracking to frameless surgical navigation. Development of this patented technology, which is now available as the **Cygnus System**, began during the early 1990s. Since then, exhaustive bench and clinical testing has demonstrated its accuracy and reliability. The present Cygnus system is the only portable image-guided system that can easily be transported between hospitals in a suitcase-style carrying case.

Image-Guided Stereotactic Surgery

The development team at Compass International, along with its surgical end users, has been developing hardware and software for image-guided stereotactic surgical systems since the early 1980s. From the robotically controlled Compass multimodality **Admiral System** to the less expensive Commander, continuous development has led to the current Cygnus configuration. These systems seamlessly network radiology to a treatment-planning console and to the operating room. This experience in hardware and software development for frame-based stereotactic surgery made possible the creation of new systems for frameless stereotactic procedures.

Cygnus System: Portable, Cost-effective, Frameless Image-Guided Surgery

The **Cygnus-PFS** portable frameless **Image-Guided Surgery System™** was introduced as a commercial product in 1998. With the Cygnus system, various stereotactic procedures that previously required placement of a stereotactic head frame could now be done without the head frame. Because of the Cygnus system's low cost, small hospitals and even private practices (as well as large academic medical centers) can offer innovative state-of-the-art intraoperative image-guidance to their patients.

Patrick J. Kelly, MD, FACS, Joseph P. Ransohoff Professor and Chairman of the Department of Neurological Surgery at New York University, commented that the Cygnus portable unit has applications for superficial and deep primary and metastatic brain tumors, arteriovenous fistulas, and cavernous hemangiomas.

"It allows the surgery to be as minimally invasive as possible, lets the surgeon follow a direct path to the lesions, and lets the surgeon know where tumor stops and normal brain begins," Dr. Kelly stated. "It's also useful when internally decompressing a large skull base tumor, since it allows the surgeon to know when the resection is getting close to the tumor edge. This prevents cutting through the other side of the tumor and risking damage to blood vessels and nerves that may be compressed by the capsule."

The Cygnus system's computer display shows the tip location of various instruments via "crosshairs" on preoperatively collected CT/MRI diagnostic images. In the operating room, the patient's head is placed in a three-point pinion headholder, and the transmitter is attached to this headholder via the transmitter mounting bracket. The same landmarks are then located and digitized on the patient by placing the pointer

tip on each landmark and again depressing the keypad. These corresponding points are used to calculate a "transformation matrix," which places the location of the patient into the image space. In the operating room, the transformer creates a magnetic field around the surgical area of interest. The receiver and instrument are then tracked by the software, "reading" precisely where they are within that magnetic field, and interactively representing them as a cursor on the diagnostic images displayed on the computer screen.



Dr. Kelly added, "We have four Cygnus units in our department, and in a typical day, all of them are being used by various surgeons. We have had three other (and considerably more expensive) frameless stereotactic systems at our institution. They are now gathering dust in closets or have been returned to their manufacturer for a fraction of their cost. The less expensive and less complicated Cygnus units continue to be used every day."

Compass International is an acknowledged international leader in developing unique and proven approaches to interactive intra-operative surgical systems. As a small company, Compass has professionals who install each system and conduct in-service training to assure your complete satisfaction. Importantly, Compass International provides ready access to live technical support professionals for surgeons and support staff.

For more information concerning Compass International and its products, call at 1-507-281-2143; fax at 1-507-281-1736, or visit the company's Web site at www.compass.com.