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AxiEM™ electromagnetic technology is a software and hardware platform that can be used for real-time surgical navigation on patients’ radiological images. The technology is particularly beneficial for pinless procedures, flexible tip tracking, and for reducing line of sight interruptions during a procedure. AxiEM™ technology’s plug-and-play design has a seamless integration with the StealthStation® S7® Navigation Platform.

The AxiEM™ system employs an electromagnetic localization system (EM localization system) to track instruments and anatomy simultaneously. The system functions by creating a magnetic field of known intensity and then uses micro sensors in key instruments to enable the StealthStation® to know where the instrument is located relative to the patient’s anatomy.

This guide provides a high level overview of the technology and suggests procedural workflows for optimal system use. Every operating room is different. Variations to what is described here may work better for your particular room.
Use the checklist below to help gather the items required for a typical StealthStation® navigated case:

- StealthStation® S7®
- AxiEM™ Portable Controller
- AxiEM™ Magnetic Field EMitter
- Vertek Articulating Arm
- Short Bedrail Adapter
- Mobile EMitter Holder
- 1 Registration Probe (for non sterile registration)
- 1 Procedure Kit (includes a patient reference device and a sterile navigation pointer/stylet)

Non-sterile clinical set-up
The non-sterile set-up of the AxiEM™ electromagnetic navigation technology consists of:
1. Positioning of the StealthStation® S7® — at least 3 feet away from surgical field
2. Set up of the AxiEM™ technology
3. Placing the patient reference in a non-sterile fashion
4. Connecting the patient reference and the registration pointer

Typical OR set up
Setting Up the AxiEM™ Technology

The AxiEM™ Portable Controller houses the electromagnetic localization system components. It is typically slid onto the OR bedrail, but as an alternate can be positioned on the back of the StealthStation® S7® platform. It is best to use a radiolucent table as these tables generally have the least amount of metal and potential for interfering with the AxiEM™ system.

Ensure the AxiEM™ system cables are all correctly connected.
The AxiEM™ Mobile Emitter is typically placed in a holder which is mounted to the operating room table. For best results, follow these practices.

1. Attach the Bedrail Clamp
2. Connect the Vertek Arm starburst
3. Position the Emitter Holder
4. Place the Emitter in the cradle

The emitter produces a low-energy magnetic field volume. The effective field of the emitter must be considered during any set-up. The usable field is approximately 12” from the face of the emitter.

Note: As a general rule the space between the patient’s head and the emitter face should be approximately equal to the width of your fist. You may get a reduced field size by having the emitter too close to the bed. It is recommended to keep the emitter high above the bed. Mayo stands or other metal objects should be kept at least 24+ inches away from the emitter.
Setting Up the Patient Reference

Inside the procedure kits there is a patient reference device, a “tracker.” The Tracker comes in two mounting options; non-invasive and skull mounted and is typically handed off for placement on the patient.

For both mounting options it is important to ensure that the reference does not move with respect to the anatomy from the time of registration or image acquisition until navigation is complete.

To complete set up simply connect the patient reference and registration pointer to any open port on the AxiEM™ Portable Controller.

Next you are ready to power on the StealthStation® S7® navigation system. As long as the cables are properly connected the AxiEM™ technology will initialize. The system should boot to the start-up screen where you can launch the appropriate Synergy® Cranial AxiEM Navigation Software, load Stealth protocol CT/MR patient images, and then register the patient.
After patient registration – Setting up for sterile navigation

Once patient registration has been completed and accuracy verified, it is time to complete the sterile setup. Since patient registration is a non-sterile procedure, it is recommended that the registration pointer be disconnected and removed from the surgical field.

There are basically two options for draping the patient and creating the sterile field: draping the AxiEM™ portable and emitter as part of the patient drape, or alternately draping the emitter by itself.

Lastly, depending on whether the procedure involves a shunt kit or a tumor kit, you can connect the sterile navigation probe or sterile shunt stylet, respectively.
AxiEM™ Electromagnetic Navigation

AxiEM™ Stylet

OR

AxiEM™ Navigation Pointer

StealthStation® AxiEM™ Navigation
AxiEM™ Electromagnetic Navigation Technology Components

Hardware

StealthStation® S7® Navigation Technology
AxiEM™ Portable System
AxiEM™ Magnetic Field EMitter
Vertek® Articulating Arm
Short Bedrail Adapter
Mobile EMitter Holder
# Single Use Instrumentation

## Ventricular Shunt Kits

- 9733606 AxiEM™ Skull-mounted shunt kit
- 9733605 AxiEM™ Non-invasive shunt kit

## Neuro Resection Tumor Kits

- 9733608 AxiEM™ Skull-mounted tumor kit
- 9733607 AxiEM™ Non-invasive tumor kit

## Registration Pointers

- 9733424 5-pack AxiEM™ Touch-N-Go Pointer
- 9733423 5-pack AxiEM™ Tracer Pointer
- 9733701 Reusable Screwdriver (For the skull mounted kits)