

Innovations in Minimally Invasive Spinal Surgery

LT Johnny V. Rodgers, RN, BSN, CNOR; LT Kenneth Dubrowski, RN, BSN; LT Kenneth Folsom, RN, BSN

Naval Medical Center, Portsmouth, VA

Naval Medical Center Portsmouth has adopted a new technology in robotic assisted minimally invasive spinal surgery. Previous methods required extensive use of fluoroscopy and a large open vertebral exposure to visualize the pedicle of each vertebra for spinal fusions. Patients with spinal deformities and previous surgeries have strong indications for utilization of this technology.

Historically, robotic devices were very large and cumbersome requiring valuable floor space in the surgical suite. With this new technology, the robotic assistive device is attached directly to the patient and remotely controlled by the surgeon using a computer workstation with a touch screen monitor. Preoperative Computerized Axial Tomography imagery and intra-operative fluoroscopic images are used to plan the operative approach. A virtual three dimensional image is created and the surgeon determines the length and placement of each pedicle, facet, or trans-laminar facet screw.

Benefits of robotic assisted devices used for the treatment of spinal deformities include; decreased radiation exposure by decreasing the number of fluoroscopic images taken and increased accuracy of screw placement by 98%. Without the use of robot guided assistance, screw misplacement has occurred in over 10% of patients. Placement of pedicle screws in patients with scoliosis or abnormal or missing anatomical landmarks from previous surgeries may have increased risks of neurological complications and thoracic deformities.

The use of robotic assisted devices in minimally invasive spinal surgery has significantly decreased radiation exposure and improved the placement accuracy of each pedicle, facet, or trans-laminar facet screw thus decreasing overall patient recovery time.

