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NEWS

RSNA Press Release

Robot-guided Procedures May Lower Physician Radiation Risks

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OAK BROOK, Ill.-Robotically guided CT fluoroscopy procedures may have the potential to cut radiation exposure without sacrificing effectiveness, according to a recent study published in the October issue of the journal *Radiology.*

"CT fluoroscopy offers many advantages to traditional interventional procedures," said Stephen B. Solomon, M.D., lead author of the study out of Johns Hopkins Medical Institutions in Baltimore, Md., "but the radiation exposure to the physician's hands can be a major concern."

With CT fluoroscopy the trajectory of a needle can be tracked in real time, which allows the physician to make adjustments as necessary. This advantage has made procedures faster, with equivalent or better success rates than those with standard intermittent CT imaging. The major limitation of CT fluoroscopy is the relatively high radiation exposure to the patient and the physician. In order to make real-time adjustments in needle trajectory, the physician's hand is in proximity to the radiation of the scanning plane. Lead drapes can be used to some effect, but may not be applicable in all cases or may be too cumbersome.

For the study, researchers sought to determine if robotically guided instruments, put in place by use of a joystick or other remote control device with visual monitoring, could effectively be used for various interventional procedures. The robot can hold, orient and drive a needle, with CT fluoroscopic guidance, to a target lesion.

Sixteen patients, age 49 to 90, underwent 23 consecutive CT-guided procedures. All of the procedures were performed without complications. Physician radiation exposure was negligible. Patients may also benefit from this approach. "Since the computer can reliably advance the robot's needle to the target, continuous imaging may not be necessary, as long as respiration is relatively controlled," Dr. Solomon points out. "This will significantly reduce patient radiation exposure."

This study indicates that use of the robot can potentially save time, improve accuracy, and reduce radiation exposure to physicians and patients in many CT fluoroscopy-guided interventional procedures.

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"Robotically Driven Interventions: A Method of Using CT Fluoroscopy Without Radiation Exposure to the Physician." Collaborating with Dr. Solomon on this paper were Alexandru Patriciu, Mark E. Bohlman, M.D., Louis R. Kavoussi, M.D., and Dan Stoianovici, Ph.D.

Video images of this procedure are available for broadcast use.

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