UT SOUTHWESTERN MEDICAL CENTER NEWS

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UT Southwestern and UT Arlington to collaborate on magnetically controlled tools for minimally invasive surgery

DALLAS – July 9, 2009 – UT Southwestern Medical Center and UT Arlington have reached an agreement with Ethicon Endo-Surgery, Inc. to develop a groundbreaking toolbox of magnetically controlled surgical instruments for minimally invasive surgery.

The investigational surgical device platform includes a wide range of magnetically controlled instruments designed to give surgeons greater maneuverability and range of motion while reducing the number of entry ports into the abdominal cavity required for surgery. The Magnetic Anchoring and Guidance System (MAGS) uses magnets outside the abdomen that attract magnets attached to novel instruments inserted inside the abdomen, allowing internal movement.

"This is powerful technology and a very innovative concept," said Dr. Daniel Scott, associate professor of surgery and director of the Southwestern Center for Minimally Invasive Surgery. "These new instruments are much better than most of the currently available technology – offering much better stability and maneuverability."

Physicians at UT Southwestern have been working over the last several years with engineers from UT Arlington's Texas Manufacturing Assistance Center. TMAC is the Texas affiliate of the National Institute of Standards and Technology's Manufacturing Extension Partnership and part of the Automation and Robotics Research Institute. The team created several generations of prototypes that are the basis for this new technology development effort with Ethicon Endo-Surgery, Inc.

"The investigators have done quite a bit to advance the technology. But we've reached the point where we really need an industry partner. This agreement offers a very complementary balance of clinical knowledge, engineering capability and commercial experience," said Dr. Dennis Stone, vice president for technology development at UT Southwestern. "The ultimate goal is to wind up with an enabling new technology available to surgeons that improves clinical outcomes."

Laparoscopic surgeries involve multiple instruments inserted into several small incisions rather than one large incision as with traditional surgeries. Laparoscopic surgeries have become standard procedure for removing gallbladders and kidneys, and increasingly in obesity-related surgeries; however, a limitation of laparoscopic surgery is the restricted movement of the device once inside the incision.

"A laparoscopic incision represents a fixed access point that has a limited working envelope that is conical in shape. We are working to develop the technology to move around more freely," explained Dr. Jeffrey Cadeddu, professor of urology and radiology and director of the Clinical Center for

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Minimally Invasive Treatment of Urologic Cancer. "The magnetic maneuverability affords a much greater range of motion inside the abdominal cavity, allowing the surgical team to more easily position instruments in their optimum locations.

"The equipment may benefit the emerging fields of laparoendoscopic single site surgery (LESS) and natural orifice translumenal endoscopic surgery (NOTES), Dr. Cadeddu said.

LESS uses one small entry point – usually one incision hidden in the bellybutton – to deploy multiple instruments, with the idea that fewer incisions reduce scarring and speed recovery.

NOTES deploys the instruments through existing natural orifices in the body, such as the mouth, anus or vagina, eliminating the need for any external incisions.

The conceptual advantage of natural orifice surgery is to eliminate surgical scars altogether. Surgeons also suspect that the internal organs perforated during the surgery will heal faster, be less prone to infection and be less painful for patients than external wounds made in traditional surgeries.

The idea of using magnets to manipulate the instruments in the abdominal cavity was formulated after Dr. Cadeddu watched a television show featuring teens that used magnets to hold studs on their lips rather than getting their lips pierced.

"The team had many technical challenges to overcome during the invention and development of this new device platform," says Dr. Raul Fernandez, project manager for TMAC. "We relied heavily upon ingenuity and teamwork to bring the project to this point, and it has been very rewarding.

"In addition to high-caliber design work, we have had a medical-engineering team focused on putting something useful in the hands of surgeons and potential commercial partners; to this we owe our collective success. Moving forward, we are eager to work with a company with the stature of Ethicon Endo-Surgery to refine the technology and put a novel suite of surgical tools in the operating room."

Karen Licitra, company group chairman for Cincinnati, Ohio-based Ethicon Endo-Surgery, Inc., said, "We are excited about the opportunity to co-develop the MAGS technology with the University of Texas. The collaboration between the clinical and engineering teams at UT is very much in line with our approach to achieving our vision of transforming patient care through innovation. We believe this partnership will help enable us to collectively explore the benefits of this technology for patients and clinicians."

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