Medtronic Highlights New Data in JAMA Surgery Demonstrating Significant Cost Savings and Reduced Patient Hospital Stays Following Minimally Invasive Surgery

March 25, 2015 3:00 PM CT

Medtronic

Study Shows Patients Who Underwent Laparoscopic Colon Resections Left Hospital Faster, Required Significantly Less Follow Up Care and Fewer Medicines Than Patients Who Underwent Open Surgery

DUBLIN - March 25, 2015 - Adding to the clinical benefits and improved patient outcomes associated with minimally-invasive surgery (MIS), Medtronic plc (NYSE: MDT) today highlighted new data demonstrating that patients who underwent minimally invasive colon resection procedures were able to leave the hospital faster, visit their doctors less for follow up care and take fewer medicines[1] than those who underwent open surgery. The findings, which were published in the March 25 online edition of *JAMA Surgery*, suggest that minimally invasive approaches offer compelling near- and long-term cost savings for the healthcare system and less trauma for patients.

"We found that the use of minimally-invasive laparoscopic approaches in a select group of patients undergoing colectomy procedures resulted in significantly lower health care costs and resource utilization compared with open surgical approaches. This may expand access and lower the cost of patient care in the long term," said lead author Conor P. Delaney, MD PhD, of University Hospitals Case Medical Center in Cleveland, Ohio. "These results reflect the well-documented benefits of laparoscopic surgery, which include faster recovery, less pain and fewer complications."

A colectomy is the surgical removal of part or all of the colon and the rectum and is usually performed to treat several digestive health conditions, including diverticulitis, Crohn's disease, ulcerative colitis and cancer of the colon and rectum.

The study found that laparoscopic colectomy procedures - which utilize three or four small incisions instead of one large incision - resulted in lower costs and reduced utilization of hospital resources across the board.

Open procedure patients stayed in the hospital for 7.4 days, while MIS patients were discharged after 4.5 days. The total procedural and hospitalization cost of care for minimally-invasive procedures was $24,196 compared to $31,601 for open approaches, a reduction of $7,405 or 23%.

In the year following surgery:

- Overall healthcare expenditures were 18% higher for open surgery compared to MIS
- Open surgery patients were 112% more likely to be admitted into the hospital as an inpatient compared to MIS
- Drug expenditures were 13% higher for open surgery compared to MIS

"The widespread adoption of minimally invasive surgery has the potential to improve care, help patients and reduce health care costs. The global medical community must come together to more quickly modernize surgery by increasing the rate of MIS adoption," said Michael Tarnoff, MD, vice president and chief medical officer, Covidien Group at Medtronic. "MIS is a prime example of the intersection of value and quality. Worldwide literature indicates that MIS is superior to open approaches in many abdominal and thoracic procedures. Ultimately, healthcare should be focused on getting patients better, faster and with less pain and MIS achieves that."

Researchers conducted a retrospective multivariate regression analysis of national health insurance claims utilizing data obtained from the Truven Health Analytics MarketScan Commercial Claims and Encounters database. The study measured three main outcomes: health care utilization, including office, hospital outpatient, and emergency department visits and inpatient services 90 days and one year after the procedure; health care expenditures; and estimated patient days off from work. The study population was comprised of 4,160 patients aged 18 to 64 years old who underwent elective

laparoscopic (45.6%) or open colectomy (54.4%) from January 2010 through December 2010.

Clinical benefits of laparoscopic colectomy, including but not limited to decreased complications, mortality and rates of readmission have been demonstrated in multiple studies.[2-6]

The *JAMA Surgery* paper is the first in a series of research into the long-term impact of minimally invasive approaches on healthcare costs and utilization. Future publications will focus on Video Assisted Thoracic Surgery and laparoscopic incisional / ventral hernia repair.

For more information on the JAMA Surgery publication and news release please visit http://archsurg.jamanetwork.com/article.aspx?articleid=2207937.

Multimedia Release
A multimedia version of this release, with links to graphics can be found at: https://medtronicmediacap.gcs-web.com/medtronic-highlights-new-data-jama-surgery-demonstrating-significant-cost-savings

About Medtronic
Medtronic plc (www.medtronic.com), headquartered in Dublin, Ireland, is the global leader in medical technology - alleviating pain, restoring health and extending life for millions of people around the world.

Any forward-looking statements are subject to risks and uncertainties such as those described in Medtronic's periodic reports on file with the Securities and Exchange Commission. Actual results may differ materially from anticipated results.

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[1] Benjamin P. Crawshaw, MD; Hung-Lun Chien, MPH; Knut M. Augestad, MD, PhD; Conor P. Delaney, MD, PhD. Effect of Laparoscopic Surgery on Health Care Utilization and Costs in Patients Who Undergo Colectomy. *JAMA Surg.* 2015; March 25 (online).

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