Medtronic News

New Clinical Trial Shows Medtronic TYRX(TM) Envelope Significantly Reduces Major Infections in Cardiac Implantable Device Patients

Late-Breaking Trial Results Presented at ACC Scientific Sessions and Published in The New England Journal of Medicine
WRAP-IT is the Largest Randomized Global Trial Ever Conducted with Cardiac Implanted Electronic Devices

DUBLIN and NEW ORLEANS - March 17, 2019 - Medtronic plc (NYSE:MDT) today announced results from the landmark Worldwide Randomized Antibiotic Envelope Infection Prevention Trial (WRAP-IT), which demonstrated the TYRX(TM) Absorbable Antibacterial Envelope (TYRX envelope) reduced the risk of major infection by 40 percent, and pocket infection by 61 percent, in patients with cardiac implantable electronic devices (CIEDs), compared to standard-of-care pre-operative antibiotics. The trial results were presented today in a late-breaking session at the American College of Cardiology's 68th Annual Scientific Sessions (ACC.19), and published simultaneously in *The New England Journal of Medicine.*

"CIED infections are associated with significant morbidity, mortality and cost. Until now, in addition to adhering to strict surgical techniques, only one intervention, pre-operative antibiotics, has been shown to significantly reduce infections," said Khaldoun Tarakji , M.D., M.P.H., associate section head of cardiac electrophysiology at Cleveland Clinic, principal investigator of the trial, and a paid consultant to Medtronic. "This study shows that, in addition to pre-operative antibiotics, the use of the antibacterial envelope significantly reduced the risk of CIED infections, and with no increased risk of complications."

The trial met its primary endpoint showing effectiveness of the TYRX envelope in reducing major infections by 40 percent in patients at increased risk for infections resulting from CIED implantation: at 12 months, 1.2 percent of patients in the control group experienced a major infection, while only 0.7 percent of patients who received the TYRX envelope had a major infection ($p=0.04$). The trial also showed a 61 percent reduction in pocket infections with the envelope ($p<0.01$).

The TYRX envelope was successfully implanted in 99.7 percent of procedure attempts, with no significant difference in procedure time between the two groups. The trial also met its safety objective: the envelope did not increase the risk of procedure-related or system-related complications through 12 months ($p<0.001$ for non-inferiority).

"These data provide strong evidence that the TYRX envelope can help prevent major infection without increasing complications," said Rob Kowal, M.D., Ph.D., vice president and chief medical officer of the Cardiac Rhythm and Heart Failure division, which is part of the Cardiac and Vascular Group at Medtronic. "This is the largest CIED trial ever conducted globally, demonstrating Medtronic's commitment to generating high-quality evidence supporting the use of our products and therapies to improve patient outcomes."

WRAP-IT is a randomized, prospective, multicenter, single-blinded, global, post-market, interventional clinical trial. It compared the incidence of major infections in patients whose CIED implantation included the TYRX envelope and patients whose procedure did not, with follow up to 12 months. The study was conducted in 181 centers in 25 countries in North America, Europe, Asia and South America, and included 776 implanters. A total of 6,983 patients participated in the trial with 3,495 randomized to receive the TYRX envelope and 3,488 randomized to the control group (without the envelope).

Millions of people with heart conditions receive a CIED, such as a pacemaker or implantable cardioverter

defibrillator (ICD), to help manage abnormal heart rhythms.As with any surgical procedure, there is risk for infection due to bacteria being introduced at the time of implant. These infections occur in 1-4 percent of all patientswith CIED implants,1,2 leading to an increased risk of death and an average cost per infection of $44,000-$83,000.3-7

The TYRX Absorbable Antibacterial Envelope is a mesh envelope that holds an implantable cardiac device or implantable neurostimulator. It is designed to stabilize the device after implantation while releasing antimicrobial agents, minocycline and rifampin, over a minimum of seven days.8 The envelope is fully absorbed by the body approximately nine weeks after implantation. 8,9 The TYRX Envelope was cleared by the FDA in 2013 and received CE Mark in 2014.

In collaboration with leading clinicians, researchers and scientists worldwide, Medtronic offers the broadest range of innovative medical technology for the interventional and surgical treatment of cardiovascular disease and cardiac arrhythmias. Medtronic strives to offer products and services of the highest quality that deliver clinical and economic value to healthcare consumers and providers around the world.

Analyst and Investor Briefing

Medtronic will host a webcast to highlight its Cardiac and Vascular Group from 2:30-3:30 p.m. CDT Sunday, March 17. The webcast will feature remarks from Medtronic management, including comments on Medtronic's clinical data and product pipelines. The live audio webcast can be accessed by clicking on the Investor Events link at http://investorrelations.medtronic.com on March 17. Within 24 hours of the webcast, a replay will be available on the same webpage. This event is not part of the official ACC Scientific Sessions.

About Medtronic

Medtronic plc (www.medtronic.com), headquartered in Dublin, Ireland, is among the world's largest medical technology, services and solutions companies - alleviating pain, restoring health and extending life for millions of people around the world. Medtronic employs more than 86,000 people worldwide, serving physicians, hospitals and patients in more than 150 countries. The company is focused on collaborating with stakeholders around the world to take healthcare Further, Together.

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.

-end-

1 Tarakji KG, et al. Am Heart J. 2016;180:12
2 Data on file for aggregated infection rate.
3 Sohail MR, et al. Circ ArrhythmElectrophysiol. 2016;9:e003929.
4 Greenspon AJ, et al. Pacing Clin Electrophysiol. 2018;41:495-503.
5 2012 Premier Healthcare Database, data on file with Medtronic plc.
6 2014-15 Medicare 100% Standard Analytic File (SAF), data on file with Medtronic plc.
7 CPI 2016 Detailed Report: CPI1612. Assessed March 2018.
8 Huntingdon Life Sciences Study TR-2013-001.
9 Sinclair Labs Study D13599.

Contacts:

Tracy McNulty
Public Relations
+1-763-526-2492

Ryan Weispfenning
Investor Relations
+1-763-505-4626

---

https://news.medtronic.com/2019-03-17-New-Clinical-Trial-Shows-Medtronic-TYRX-TM-Envelope-Significantly-Reduces-Major-Infections-in-Cardiac-Implantable-Device-Patients