NOV 25, 2025

Medtronic unveils Signia™ Circular stapler with Tri-Staple™ technology, bringing real-time intelligence and a new standard of precision to surgery

New intelligent stapling system provides real-time tissue feedback to standardize performance

Medtronic plc , a global leader in healthcare technology, has today announced the limited launch of the Signia™ Circular Stapler with Tri-Staple™ technology. The new system gives surgeons the first intelligent circular stapling option throughout the alimentary tract for the creation of end-to-end, end-to-side, and side-to-side anastomoses in both open and laparoscopic surgeries. It combines powered and intelligent clamping with improved perfusion of the staple line,[1] as well as reducing stress on tissue during compression and clamping.[2,3,4,5,6.] The Signia Circular Stapler has also received regulatory market authorization in major markets globally, including the United States, Western Europe and Japan.

With over 6,000 staplers used in ORs across the US every day, Signia™ stapler brings intelligence to one of the most important parts of surgery. Circular staplers are commonly used in colorectal resection surgery, a procedure that is standard treatment for colon cancer and the main treatment for rectal cancer. When the two ends of the colon are not sealed properly, an anastomotic leak can occur, and gastrointestinal contents of the gut can leak out of the wound site, increasing the risk of a serious infection. Anastomotic leaks can occur in up to 19% of these procedures.[7,8,9]

The Signia™ Circular stapler is the only circular stapler in the market that allows for integrated leak testing and provides greater leak reduction.[*1,10]Other differentiated features include:

- Up to 53% less distal tip motion during clamping and firing.[††111]

- 88% reduction in waste per procedure thanks to its universal, reusable handle.[Δ12]

"The Signia™ Circular stapler brings a new level of precision and confidence to the OR," **said Krista Sugerman, vice president & general manager, Core Surgical Innovations, which is part of the Medtronic Medical Surgical Portfolio.** "This technology helps standardize performance, improve efficiency, reduce variation, and ultimately supports better patient outcomes. It's also a vital step toward building a complete and connected OR, where intelligent instruments work together across digital and robotics platforms to support improved patient outcomes."

The Signia™ Circular stapler integrates the Medtronic **Tri-Staple™** and **Adaptive Compression™** technologies to monitor and adjust the amount of compression that is being applied, which may prevent the user from over-compressing and damaging tissue[13]. Less tissue compression from the powered intelligence of the Signia™ Circular stapler can reduce hematoma formation by as much as 80%[††14,15]. It also has been shown to provide up to 164% improved perfusion into the staple line.*[2,16,17,18]

"We are excited to bring the Tri-Staple™ technology that many surgeons have come to rely on in our Signia™ linear staplers to procedures that require circular staplers, such as colorectal resection," **said Dr Matthew Kroh, chief medical officer, Core Surgical Innovations at Medtronic**. "With superior performance, intelligent feedback, and a unique set of features that enable greater perfusion and more protection against leaks, surgeons can now rely on the Signia™ circular stapler to deliver a confident staple line."

Full product availability is anticipated in early summer 2026. For more information, visit the Signia™ page.

Notes to editors:

*Preclinical results may not correlate with clinical performance in humans. Based on leak testing in an in vivo canine model comparing Signia™ Circular stapler (SIGCIR25XT) to ECHELON CIRCULAR™ Powered stapler (CDH25P) ($n = 9$; $p = 0.007$).

†The Signia™ circular stapler allows 164% greater perfusion into the staple line than the Echelon Circular™* powered stapler, which may facilitate better wound healing at the anastomotic site. Compared to the ECHELON Circular™* powered stapler in an in vivo benchtop comparison (CDH31P: $n = 13$; SIGCIR31XT: $n = 9$, $p = 0.043$). Results may not correlate with clinical performance in humans.

††Based on simulated use by trained surgeons comparing CDH31P to SIGCIR31XT ($n = 15$, $p < 0.001$)

ΔTotal waste based on device component weights and expected circulation ratio of each component on a per-procedure basis comparing CDH31P to the Signia™ circular stapler with a 31 mm Tri-Staple™ reload ($n = 3$, $p < 0.001$).

About Medtronic

Bold thinking. Bolder actions. We are Medtronic. Medtronic plc, headquartered in Galway, Ireland, is the leading global healthcare technology company that boldly attacks the most challenging health problems facing humanity by searching out and finding solutions. Our Mission — to alleviate pain, restore health, and extend life — unites a global team of 95,000+ passionate people across more than 150 countries. Our technologies and therapies treat 70 health conditions and include cardiac devices, surgical robotics, insulin pumps, surgical tools, patient monitoring systems, and more. Powered by our diverse knowledge, insatiable curiosity, and desire to help all those who need it, we deliver innovative technologies that transform the lives of two people every second, every hour, every day. Expect more from us as we empower insight-driven care, experiences that put people first, and better outcomes for our world. In everything we do, we are engineering the extraordinary. For more information on Medtronic, visit www.Medtronic.com

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[1] Preclinical test results may not necessarily be indicative of clinical performance. Compared to the EEA™ circular stapler with DST Series™ technology in an in vivo benchtop comparison (EEA31: n = 15; SIGCIR31XT: n = 9, p = 0.045). OR Compared to the Ethicon Circular™* powered stapler in an in vivo benchtop comparison (CDH31P: n = 13; SIGCIR31XT: n = 9, p = 0.043).

[2] Based on internal test report #RE00470656 rev.0, Comparative in vivo leak testing. July 2023

[3] Based on internal test report #RE00330708 rev.1, PCG-42, Perfusion analysis for circular staplers. May 13, 2021.

[4] Based on internal test report #RE00185349 rev.1, Tissue clamp benchmark vs. manual instruments (Tulip, DST™, & Ethicon™*). Nov 2023.

[5] Based on internal test report #RE00350454, Compression testing for powered CDH 29mm product. Sept. 13, 2021.

[6] Bench test results may not necessarily be indicative of clinical performance. Compared to EEA™ circular staplers

with DST
Series™ technology (EEA2835, $p < 0.001$, n = 5), Ethicon™ CDH (CDH29A n = 9 , $p < 0.001$, n = 5 for SIGCIR, for CDHA), and Ethicon Echelon Circular™* powered stapler (Ethicon™ CDH29P, $p < 0.001$, n = 5).

[7] Tsalikidis C, Mitsala A, Mentonis VI, et al. Predictive Factors for Anastomotic Leakage Following Colorectal Cancer Surgery: Where Are We and Where Are We Going?. Curr Oncol. 2023;30(3):3111-3137. Published 2023 Mar 7. doi:10.3390/curroncol30030236

[8] [1] Litchinko A, Buchs N, Balaphas A, et al. Score prediction of anastomotic leak in colorectal surgery: a systematic review. Surg Endosc. 2024;38(4):1723-1730. doi:10.1007/s00464-024-10705-1.

[9] Renna MS, Grzeda MT, Bailey J, et al. Intraoperative bowel perfusion assessment methods and their effects on anastomotic leak rates: meta-analysis. Br J Surg. 2023;110(9):1131-1142. doi:10.1093/bjs/znad154

[10] Preclinical results may not correlate with clinical performance in humans. Based on leak testing in an in vivo canine model comparing Signia™ Circular Stapler to ECHELON CIRCULAR™ Powered Stapler (SIGCIR28MT: n=18; CDH29P, n = 14; $p = 0.028$).

[11] Based on internal test report #RE00394109 rev. 0, Distal tip motion and user feedback for circular staplers: EEA™ with Tri-Staple™, Signia™ circular with Tri-Staple™, and Ethicon™* Echelon™* circular powered stapler. October 2023.

[12] Based on internal test report #RE00421208 rev. 0, PCG-055: Per procedure waste. January 4, 2023.

[13] Compared to manual clamping circular staplers, $p < 0.001$, n= 5 for SIGCIR, n = 9 for TriEEA. Bench test results may not necessarily be indicative of clinical performance.

[14] Based on internal test report #RE00394488, Hematoma analysis of Signia™ Circular and Ethicon Echelon™* Powered circular firings. Oct 2023

[15] Preclinical results may not correlate with clinical performance in humans. Based on compression testing in an in vivo canine model comparing SIGCIR28XT (n=3) to CDH29P (n = 3), $p = 0.007$.

[16] Blanco-Colino R, Espiin-Basany E. Intraoperative use of ICG fluourescence imaging to reduce the risk of anastomotic leakage in colorectal surgery: a systematic review and meta-analysis. Tech Coloproctol. 2018;22(1):15-23.

[17] [1] Smallwood N, Mutch MG, Fleshman JW. The failed anastomosis. In: Steele SR, Maykel JA, Champagne BJ, Oragnio Gr, eds. Complexities in Colorectal Surgery: Decision-Making and Management. New York, NY: Springer Science and Business Media; 2014:277-304.

[18] Compared to the Ethicon Circular™* powered stapler in an in vivo benchtop comparison (CDH31P: n = 13; SIGCIR31XT: n =9, $p = 0.043$). Results may not correlate with clinical performance in humans.

https://news.medtronic.com/Medtronic-unveils-Signia-TM-Circular-stapler-with-Tri-Staple-TM-technology,-bringing-real-time-intelligence-and-a-new-standard-of-precision-to-surgery