TRANSFORMING PATIENT LIVES
BY TRANSFORMING COLORECTAL HEALTHCARE

A comprehensive overview of services and solutions for colorectal procedures

Medtronic
Further, Together

INTRODUCTION

PATIENT EXPERIENCE

CLINICAL CHALLENGES

PRODUCTS

BETTER PATIENT OUTCOMES THROUGH LESS INVASIVE CARE

We're committed to bringing a less invasive approach to Colorectal Health. One that puts the patient at the center and spans from diagnosis to treatment and recovery. And we're not going to do it alone.

We're inviting partners new and old to join us in improving the complete patient experience. Through powerful collaborations, we'll identify new, less invasive therapies — and make today's solutions even more effective.

Together, we'll bridge treatment gaps and pave the way to increased access for all patients. And deliver better care, better patient outcomes, and better lives for everyone.

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IMPROVING THE COMPLETE **PATIENT EXPERIENCE**

EARLY **DIAGNOSIS**

Early diagnosis is key to a better patient experience. Our products span the care continuum to help give your patients a less invasive journey from diagnosis to treatment and recovery.

INNOVATIVE **TREATMENT**

Helping you overcome challenges requires innovation.

Together, we can develop transformative technologies and create services that rise to a common goal: better patient outcomes.

FASTER **RECOVERY**

Shorter hospital stays, faster recoveries, and a better quality of life for the long-term. Positive patient outcomes are at the heart of everything we do.

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LESS INVASIVE. **MORE BENEFITS.**

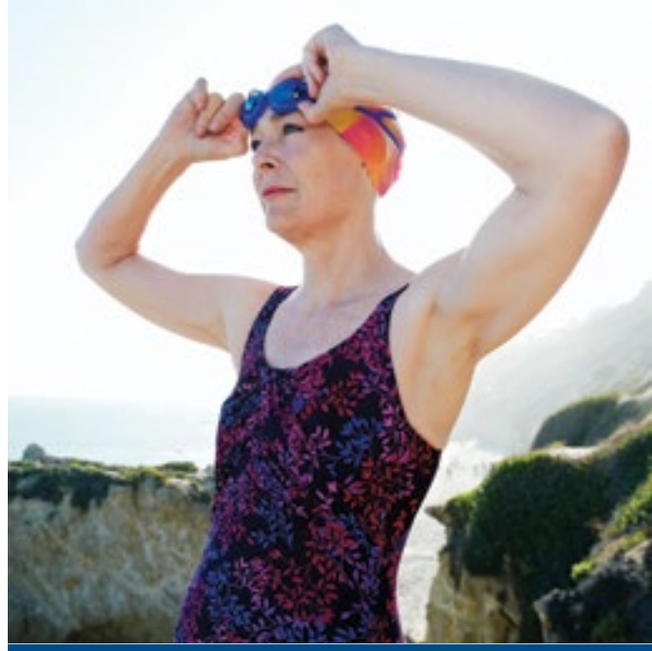
A shift in surgical technique is making a huge impact for patients and healthcare providers

Minimally invasive surgery (MIS) offers multiple advantages over open surgery, specifically[1–3]:

- Fewer readmissions
- Less postoperative pain
- Lower costs

Taken together, the benefits of MIS over open surgery are significant. That's why we're working with partners to overcome infrastructure and training barriers — to make MIS the first choice in colorectal healthcare.

REFERENCES



ADVANTAGES WITH MIS

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MIS STEPS

OPEN STEPS

PATIENT FIRST SOLUTIONS FROM DIAGNOSIS TO RECOVERY

MIS SOLUTIONS

OPEN SURGERY SOLUTIONS

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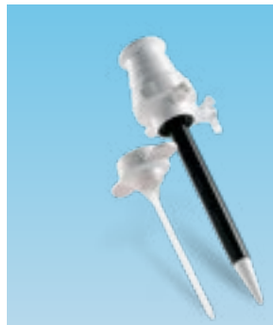
MIS PROCEDURAL STEPS:
LESS INVASIVE TECHNOLOGY.
BETTER PATIENT OUTCOMES.

 ACCESS	 MOBILIZATION & DISSECTION	 DIVISION OF CRITICAL STRUCTURES	 ANASTOMOSIS	 CLOSURE
VersaStep™ Plus radially expanding trocar	LigaSure™ retractable L-hook laparoscopic sealer/divider	Signia™ stapling system	EEA™ circular stapler with Tri-Staple™ technology	Polysorb™ suture
VersaOne™ optical trocars	Sonicision™ cordless ultrasonic dissection device	Endo GIA™ reloads with Tri-Staple™ technology	EEA™ stapler with DST Series™ technology	Biosyn™ suture
VersaOne™ fascial closure system	LigaSure™ Maryland jaw device	Endo GIA™ radial reload with Tri-Staple™ technology		Maxon™ suture
SurgiSleeve™ wound protector		Endo GIA™ ultra universal stapler		V-Loc™ knotless wound closure device

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      - VersaOne™ optical trocar
      - VersaOne™ fascial closure system
      - SurgiSleeve™ wound protector
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VersaStep™ Plus Radially Expanding Trocar

Smooth insertion and secure fixation

A bladeless access device that combines the advantages of Step™ radial dilation technology with the Versaseal™ Plus universal seal.

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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VersaOne™ Optical Trocar

Access without the excess

A universal trocar system that offers visualization on the first entry of the tissue layer.

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VersaOne™ Fascial Closure System

A trocar. A closure system. An all-in-one device.[1]

The VersaOne™ fascial closure system is a unique all-in-one[1] solution that serves as a trocar and a fascial closure device to deliver:

- Consistent port-site closure[1]
- Added procedural efficiency[1,†]
- Ease of use[1]

†Saves time compared to the competitive closure device, suture passers, and hand sutures.

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SurgiSleeve™ Wound Protector

Maximized exposure. Wound protection. Superior strength.[1]

SurgiSleeve™ wound protector provides circumferential elastic retraction that maximizes working area for optimal exposure and visualization.

In a randomized clinical trial, the use of barrier wound protection in open elective colorectal resectional surgery resulted in a clinically significant reduction in incisional surgical site infections. The study concluded that barrier wound protection of this nature should be considered routine in this type of surgery.[2]

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LigaSure™ Retractable L-Hook Laparoscopic Sealer/Divider

One instrument. Five functions. Countless benefits.

The functionality of five laparoscopic devices come together in one versatile instrument[1,†] — with the reliable performance of LigaSure™ technology and Valleylab™ monopolar energy.

†29 out of 29 surgeons evaluated agreed.

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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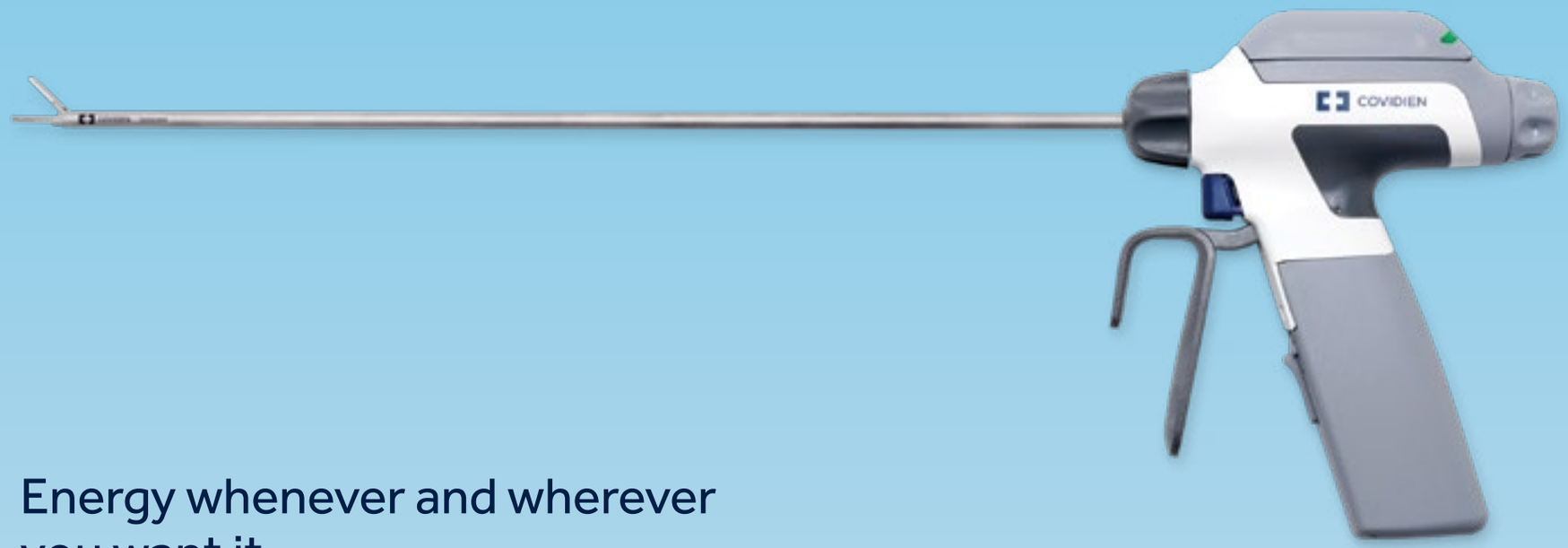
Sonicision™
Cordless Ultrasonic Dissector



Energy whenever and wherever you want it

The first cordless ultrasonic dissection system meets all your ultrasonic dissection needs and — with its cordless design — contributes to a safer operating room (OR).[1]

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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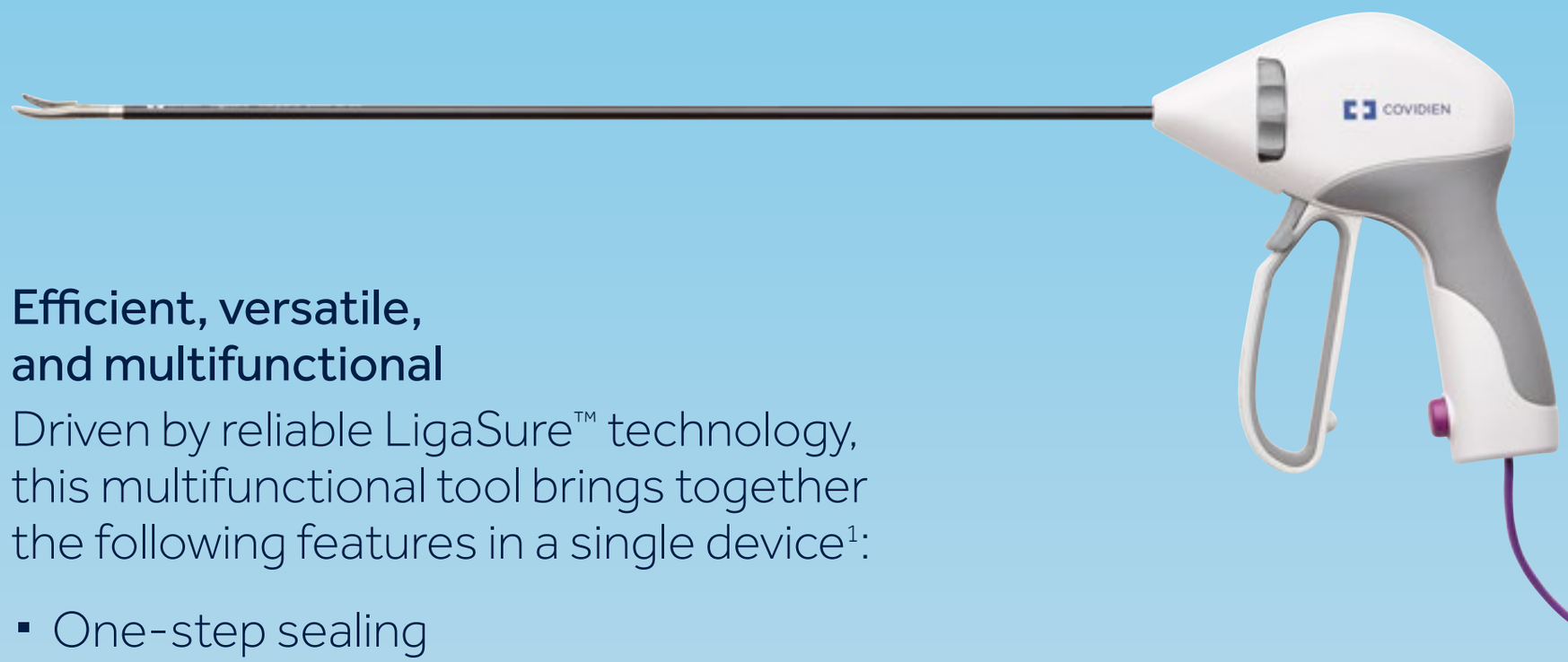
LigaSure™ Maryland Jaw Device



Efficient, versatile, and multifunctional

Driven by reliable LigaSure™ technology, this multifunctional tool brings together the following features in a single device[1]:

- One-step sealing
- A Maryland dissector
- An atraumatic grasper
- Cold scissors

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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      - Endo GIA™ radial reload with Tri-Staple™ technology
      - Endo GIA™ Ultra Universal stapler
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  - OPEN STEPS

Signia™ Stapling System

Intelligence Enabled™

Not just a new stapler. A smart stapler.

Smart technology that gives you real-time feedback and powered rotation, articulation, and firing — with one hand.[1]

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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Endo GIA™ Reloads with Tri-Staple™ Technology

Stapling made smarter

Tri-Staple™ technology reloads are designed to meet critical surgical challenges.

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Endo GIA™ Radial Reload with Tri-Staple™ Technology

Below and beyond in lower anterior resection (LAR)

Setting new standards for access, maneuverability, and staple line security in LAR procedures with this innovative design.

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      - Endo GIA™ radial reload with Tri-Staple™ technology
      - Endo GIA™ Ultra Universal stapler
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Endo GIA™
Ultra Universal Stapler

The Endo GIA™ Ultra Universal stapler combines an ergonomic design, articulation, and one-handed grasping.

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      - EEA™ circular stapler with Tri-Staple™ technology
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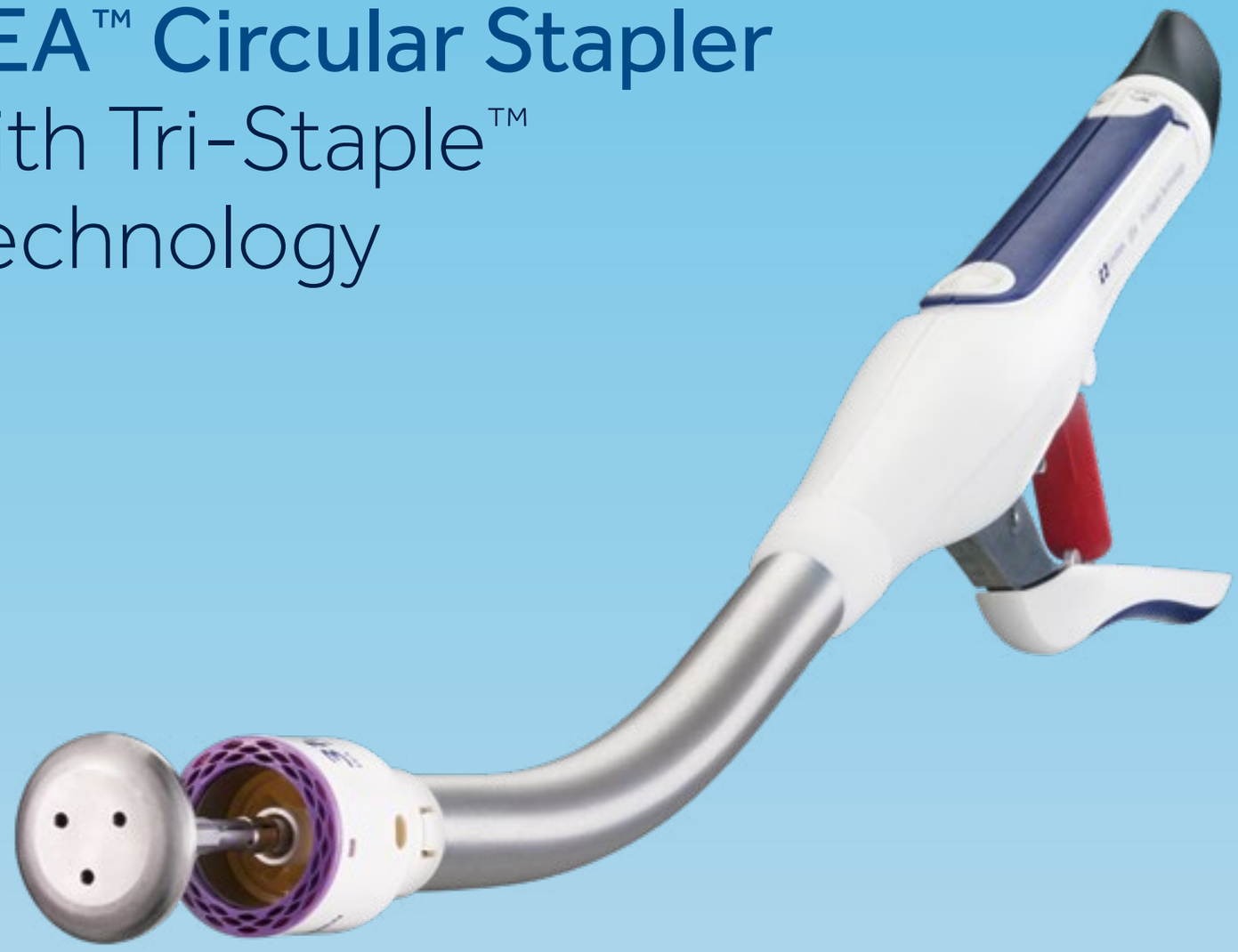
EEA™ Circular Stapler with Tri-Staple™ Technology



Staple line security. Times three.

The proven performance of Tri-Staple™ technology on the EEA™ circular stapler.

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EEA™ Stapler with DST Series™ Technology

The EEA™ stapler with DST Series™ technology provides reliable and consistent performance backed by years of clinical experience.

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    - Polysorb™ suture
    - Biosyn™ suture
    - Maxon™ suture
    - V-Loc™ knotless wound closure device
- OPEN STEPS

Polysorb™
Braided Absorbable Sutures

Strength and security when you need it most

Braided synthetic absorbable suture with applications in all surgical specialities where a strong absorbable suture is needed.

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      - V-Loc™ knotless wound closure device
  - OPEN STEPS

Biosyn™
Monofilament Absorbable Sutures

Our customers have trusted Biosyn™ sutures for over 20 years

Biosyn™ sutures provide the strength retention and absorption profiles to meet your surgical and tissue healing needs.

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      - Maxon™ suture
      - V-Loc™ knotless wound closure device
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Maxon™
Monofilament Absorbable Sutures

Our customers have trusted Maxon™ sutures for over 30 years

Maxon™ sutures are long-term monofilament absorbable sutures that provide excellent strength over the critical wound healing period.

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      - Polysorb™ suture
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      - Maxon™ suture
      - V-Loc™ knotless wound closure device
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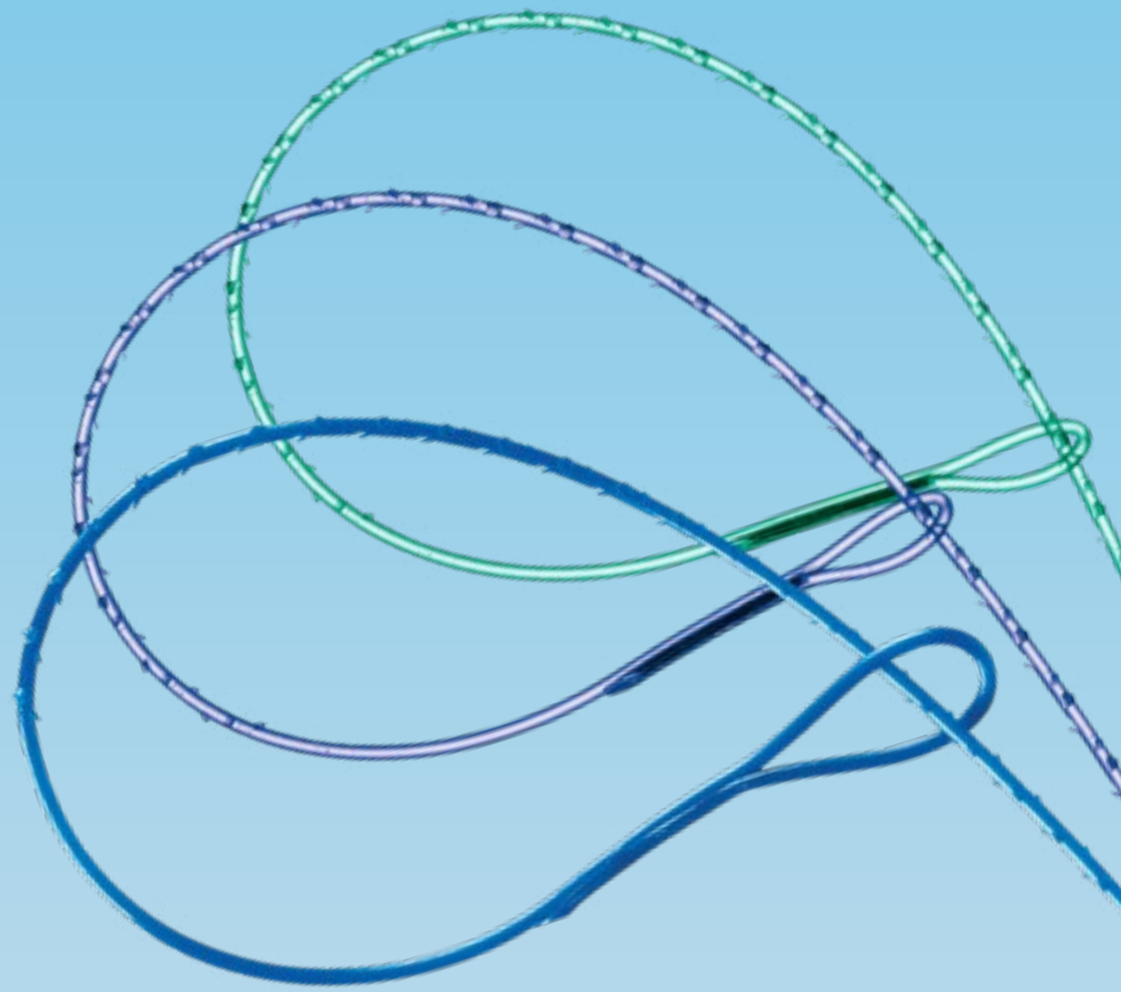
V-Loc™ Knotless Wound Closure Device



The V-Loc™ knotless wound closure device is a revolutionary technology that closes wounds securely without the need to tie knots

The device achieves a secure closure for patients.

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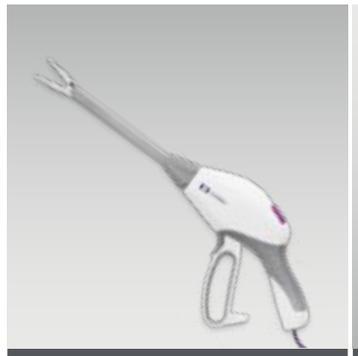
OPEN PROCEDURAL STEPS: TECHNOLOGY YOU CAN TRUST.



MOBILIZATION & DISSECTION

- LigaSure™ Maryland jaw device
- LigaSure Impact™ curved large jaw open sealer-divider, nano-coated
- Sonicision™ cordless ultrasonic dissection device

DIVISION OF CRITICAL STRUCTURES

- TA™ stapler with DST Series™ technology
- GIA™ stapler with DST Series™ technology
- SurgiSleeve™ wound protector

ANASTOMOSIS

- EEA™ circular stapler with Tri-Staple™ technology
- EEA™ stapler with DST Series™ technology

CLOSURE

- Polysorb™ suture
- Biosyn™ suture
- Maxon™ suture
- V-Loc™ knotless wound closure device

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      - LigaSure Impact™ open instrument
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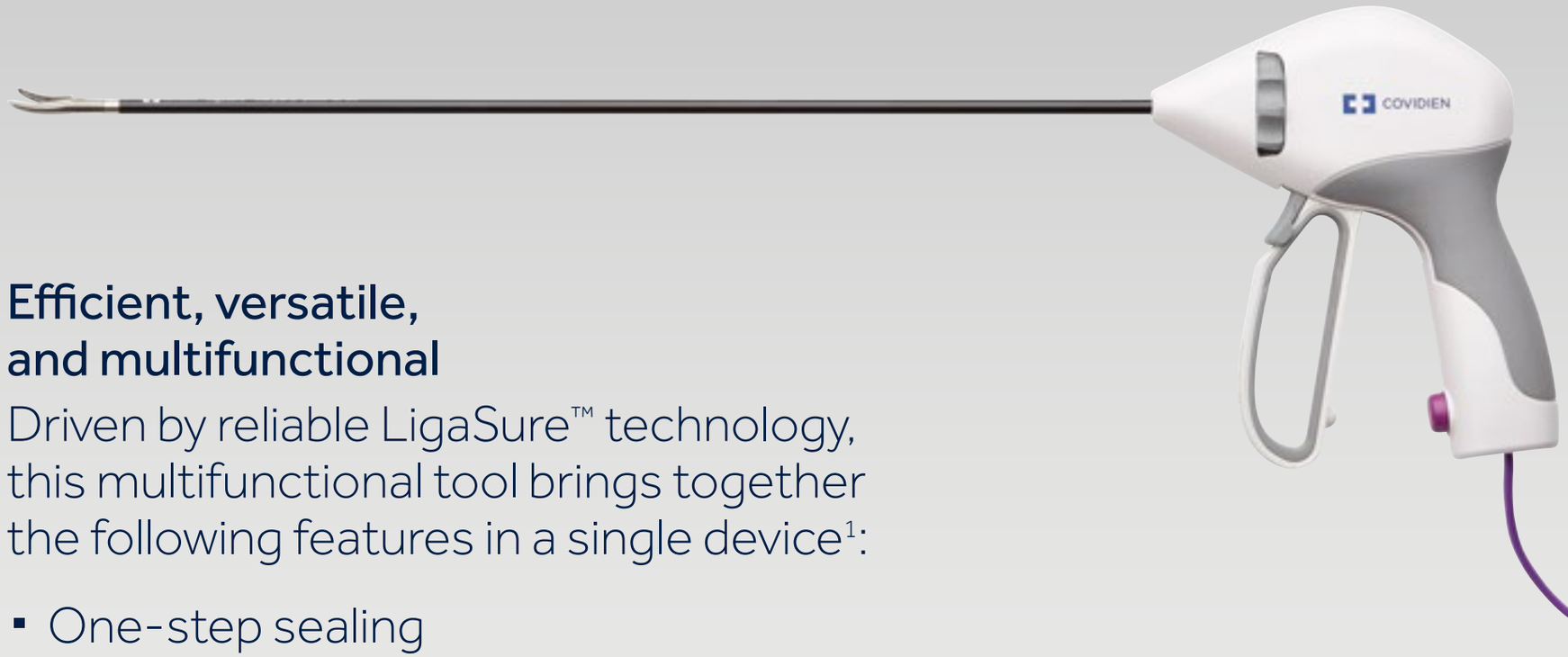
    - ANASTOMOSIS
    - CLOSURE

LigaSure™
Maryland Jaw Device



Efficient, versatile, and multifunctional

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    - CLOSURE

LigaSure Impact™
Curved Large Jaw Sealer/ Divider, Nano-coated

Seal smarter. Seal better.

Multifunctional tissue fusion system with integrated cutting mechanism — delivers reliable performance and procedural efficiency.[1]

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Sonicision™
Cordless Ultrasonic Dissector

Energy whenever and wherever you want it

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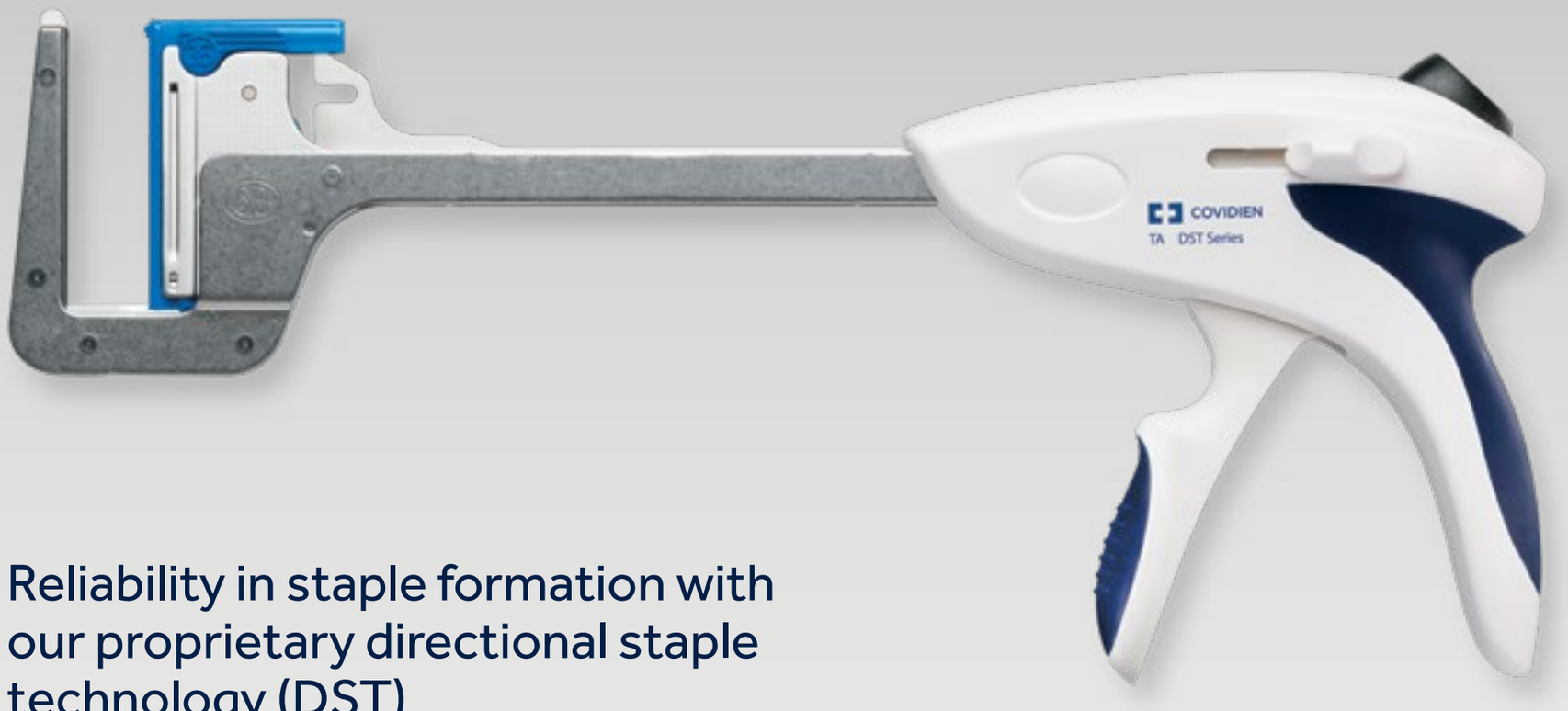
TA™ Stapler with DST Series™ Technology



Reliability in staple formation with our proprietary directional staple technology (DST)

A reloadable linear stapler that places one double staggered row of titanium staples to occlude tissue during open colorectal surgery.

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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GIA™ Stapler with DST Series™ Technology

Reliability in staple formation with our proprietary DST

A reloadable linear stapler that places two double-staggered rows of titanium staples and simultaneously cuts and divides tissue during open colorectal surgery.

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      - EEA™ circular stapler with Tri-Staple™ technology
      - EEA™ stapler with DST Series™ technology
    - CLOSURE

EEA™ Circular Stapler with Tri-Staple™ Technology

Staple line security. Times three.

The proven performance of Tri-Staple™ technology on the EEA™ circular stapler.

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EEA™ Stapler with DST Series™ Technology

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      - V-Loc™ knotless wound closure device

Polysorb™
Braided Absorbable Sutures

Strength and security when you need it most

Braided synthetic absorbable suture with applications in all surgical specialities where a strong absorbable suture is needed.

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Biosyn™
Monofilament Absorbable Sutures

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Biosyn™ sutures provide the strength retention and absorption profiles to meet your surgical and tissue healing needs.

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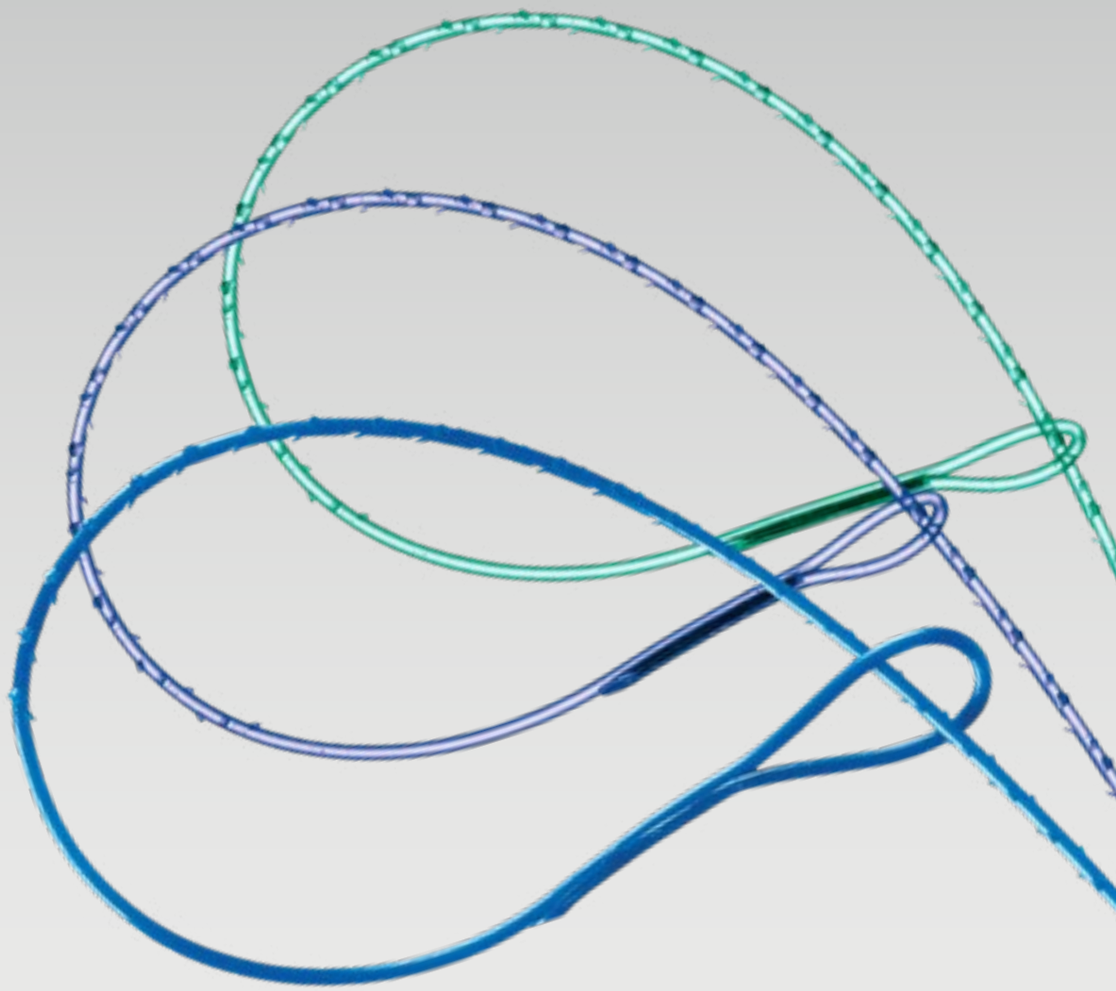
      - Polysorb™ suture
      - Biosyn™ suture
      - Maxon™ suture
      - V-Loc™ knotless wound closure device

V-Loc™ Knotless Wound Closure Device

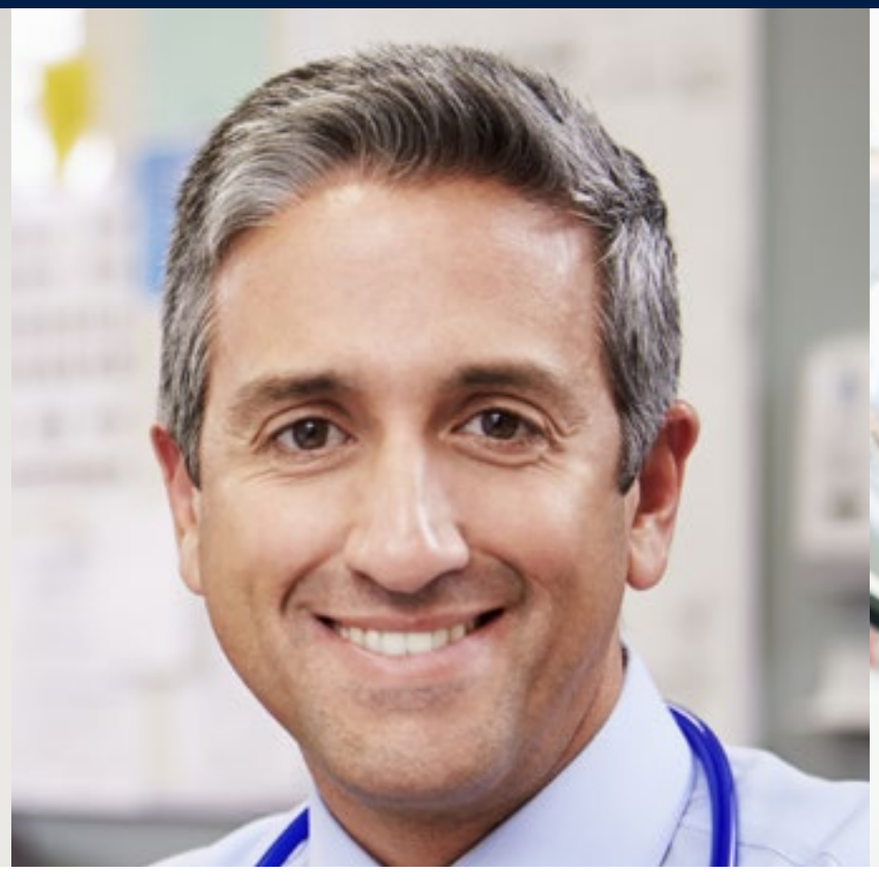


The V-Loc™ knotless wound closure device is a revolutionary technology that closes wounds securely without the need to tie knots

The device achieves a secure closure for patients.

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

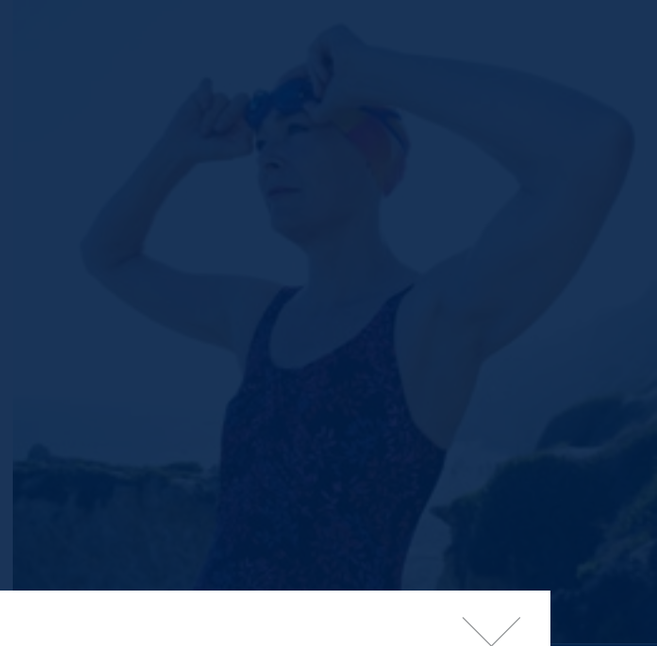
Medtronic



Medtronic
Further, Together

LESS INVASIVE. **MORE BENEFITS.**

A shift in surgical technique is making a huge impact for patients and healthcare providers



SHORTER HOSPITAL STAYS.
2.5 DAYS DIFFERENCE, ON AVERAGE.[4–8, 11–19]

53% LESS BLOOD LOSS,
ON AVERAGE.[5–10]

FASTER RECOVERY.
QUICKER RETURN TO NORMAL ACTIVITY.[20]

3.2% LOWER RATE
OF SURGICAL SITE INFECTION.[21–23]

Medtronic

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TECHNOLOGY

Reliability every step of the way:

- Step™ radially expanding technology allows the VersaStep™ trocar to yield smaller fascial defects for an equivalent cannula size — compared to conventional bladed trocars.[1]
- A durable seal ensures that insufflation is maintained even during long advanced cases needing many instrument exchanges.
- A rotating instrument seal provides excellent tactile feel and full range of motion while maintaining an airtight seal.

NO CONVERTER ACCESSORIES ARE REQUIRED FOR INSTRUMENTS OF DIFFERENT SIZES

PERFORMANCE

CHALLENGE	SOLUTION
Risk of tissue trauma.	Step™ radially expanding technology allows the VersaStep™ trocar to yield smaller fascial defects for an equivalent cannula size — compared to conventional bladed trocars.[1]
Need for converter accessories for instruments of different sizes.	VersaStep™ Plus radially expanding trocar maintains pneumoperitoneum while facilitating exchange of instruments ranging from 4.5 mm to 12 mm.
Lack of flexibility during instrument exchange.	VersaStep™ Plus self adjusts to accept 5 mm to 12 mm instruments minimizing the loss of safe working space.

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VersaOne™ optical trocar

VersaOne™ fascial closure system

SurgiSleeve™ wound protector

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VersaStep™ Plus Radially Expanding Trocar

A bladeless access device that combines the advantages of Step™ radial dilation technology with the Versaseal™ Plus universal seal.

SPECIFICATIONS

Available in 5 mm, 11 mm, 12 mm, and 15 mm sizes.

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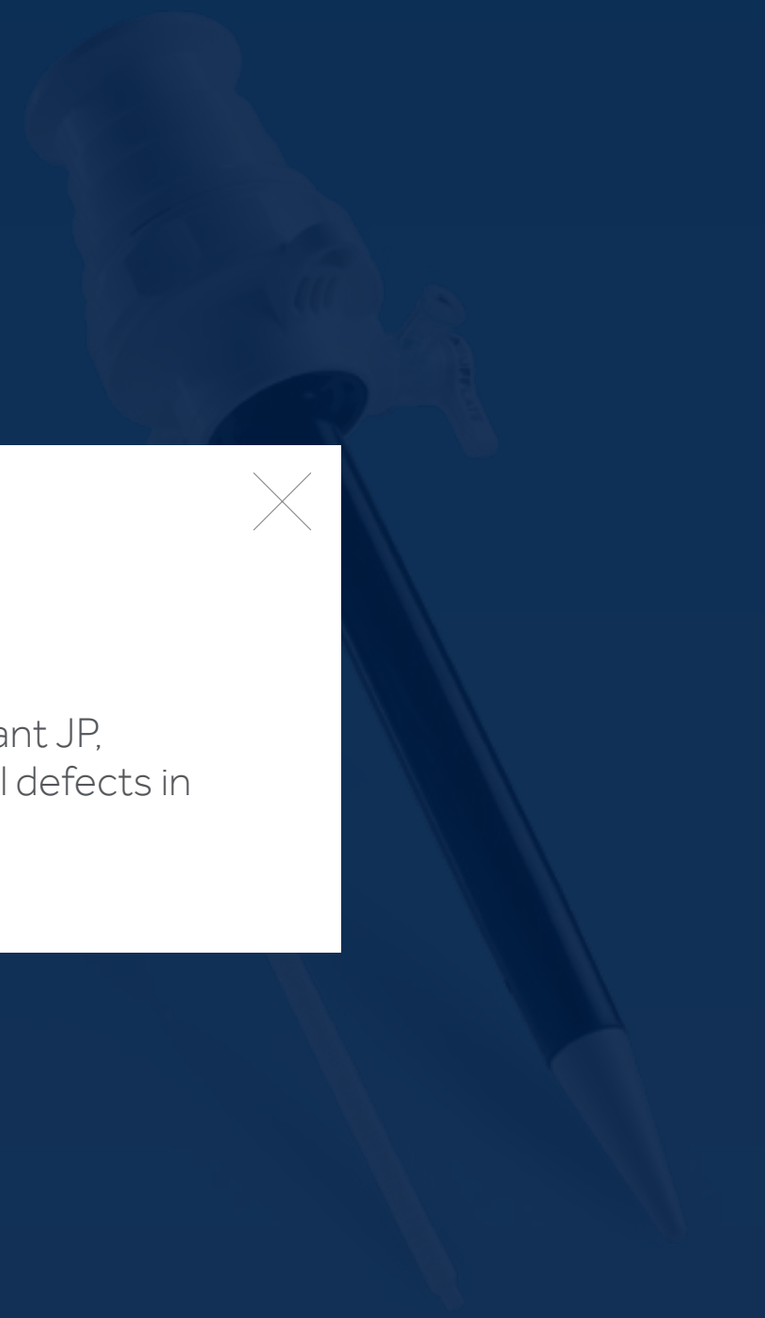
VersaStep™ Plus Radially Expanding Trocar



combines the advantages of Step™ radial dilation technology with the Versaseal™ Plus universal seal.

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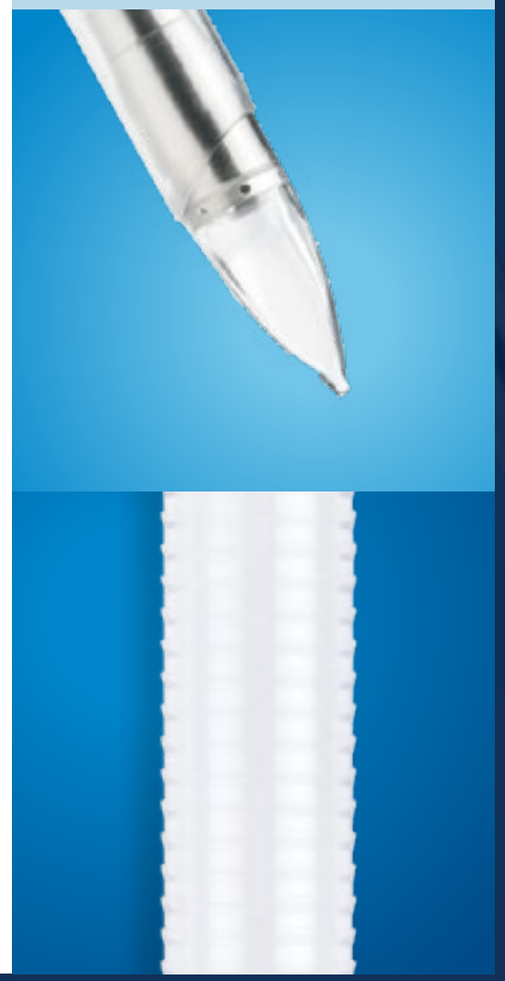
VersaOne™ optical trocar delivers:

- "Dolphin-nose tip" to facilitate smoother insertion for easier trocar placement versus Applied Medical[1]
- Advanced fixation ribs to keep cannula from moving during surgical procedure[1]
- Excellent visualization during insertion



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CHALLENGE	SOLUTION
Risk of injury during primary port placement.	VersaOne™ optical trocar has increased visibility with optical tip geometry allowing for an informed entry.[1,†]
Insufficient visualization.	VersaOne™ optical trocar has a clear cannula for visualization.[†]
Difficult insertion.	VersaOne™ optical trocar has a bladeless "dolphin nose" obturator tip that facilitates smooth insertion for easier trocar placement, as well as a bladed obturator option.[1]
Multiple codes and SKUs across procedures.	VersaOne™ optical trocar has an interchangeable obturator allowing flexibility for procedural needs.

†Images recorded on March 14, 2013, as part of a trocar clarity evaluation in an inanimate abdominal model; images representative of evaluation results.

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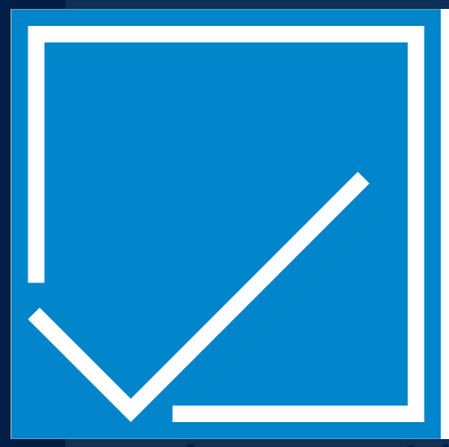

SPECIFICATIONS

Available in 5 mm, 11 mm, 12 mm, and 15 mm sizes.

Access without the excess

A universal trocar system that offers visualization on the first entry of the tissue layer.

VersaOne™ Optical Trocar

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1. Based on internal test report #2143-114, Applies to Medtronic 12 mm trocars, when compared to Applied Kii™* (12 mm trocar, Z-thread cannula). March 2013.

A universal trocar system that offers visualization on the first entry of the tissue layer.

TECHNOLOGY

Access and closure with a single device

The VersaOne™ fascial closure system is an all-in-one[1] device that brings consistency to laparoscopic closures.[1] It also:

- Eliminates the need to remove the trocar before closing[1,2]
- Makes reinsufflation unnecessary — pneumoperitoneum can be maintained throughout the procedure[2]

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PERFORMANCE

CHALLENGE	SOLUTION
Risk of injury during primary port placement.	VersaOne™ fascial closure system has increased visibility with optical tip geometry allowing for an informed entry.[3,†]
Insufficient visualization.	VersaOne™ fascial closure system has a clear cannula for visualization.[†]
Difficult insertion.	VersaOne™ fascial closure system has a bladed and bladeless "dolphin-nose" obturator tip facilitating smooth insertion for easier trocar placement.[4,†]
Multiple codes and SKUs needs across procedures.	VersaOne™ fascial closure system has an interchangeable obturator allowing flexibility for procedural needs.

†As compared to our legacy trocars.

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VersaOne™ Fascial Closure System

A trocar. A closure system.
An all-in-one device.[1]

- Added procedural efficiency[1,†]
- Ease of use[1]

†Saves time compared to the competitive closure device, suture passers, and hand sutures.

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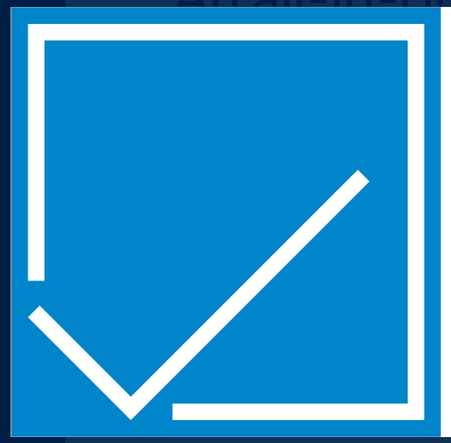

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Available in 12 mm optical and bladeless models.

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4. Based on internal test report #2143-114, Applies to Medtronic 12 mm trocars, when compared to Applied Kii™* (12 mm trocar, Z-thread cannula). March 2013.

†Saves time compared to the competitive closure device, suture passers, and hand sutures.

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TECHNOLOGY

SurgiSleeve™ wound protector provides optimal exposure and wound protection in surgical cases

SurgiSleeve™ wound protectors:

- Are superior in film strength to Alexis™* wound protector/retractors[1]
- Offer equivalent or greater exposure versus Alexis™* O with a retraction ring in the large and extra-large sizes as rated by 98 percent of surgeons surveyed[3,4]
- Are available with large and extra-large retraction rings that are fast to place and remove[5]
- Are faster to roll down compared to Alexis™* O as rated by a majority of surgeons surveyed[6]
- Come in 5 SKUs to cover all your wound protection needs versus 15 SKUs for Alexis™* O wound protector/retractor

PERFORMANCE

CHALLENGE	SOLUTION
Sufficient retraction at incision site.[5,7–10]	SurgiSleeve™ wound protector has a blue proximal ring that is not only easier to roll down compared to Alexis™* O, but can be rolled down by just one person.†
Adequate exposure to the body.[5,7–10]	SurgiSleeve™ wound protector has a retraction ring (large and extra-large sizes) providing optimal retraction and visibility compared to Alexis™* O and a stable platform for access to the body.[6]
Potential for wound contamination.[5,7–10]	SurgiSleeve™ wound protector has three times stronger film material[1] compared to Alexis™* O offering optimal wound protection.

†Survey of 29 General and OB/GYN surgeons of SurgiSleeve™ Wound Protector and Alexis®* O conducted during a product demonstration event October 28–29, 2014 in San Francisco, CA.

SurgiSleeve™ Wound Protector

Maximized exposure. Wound protection. Superior strength.[1]

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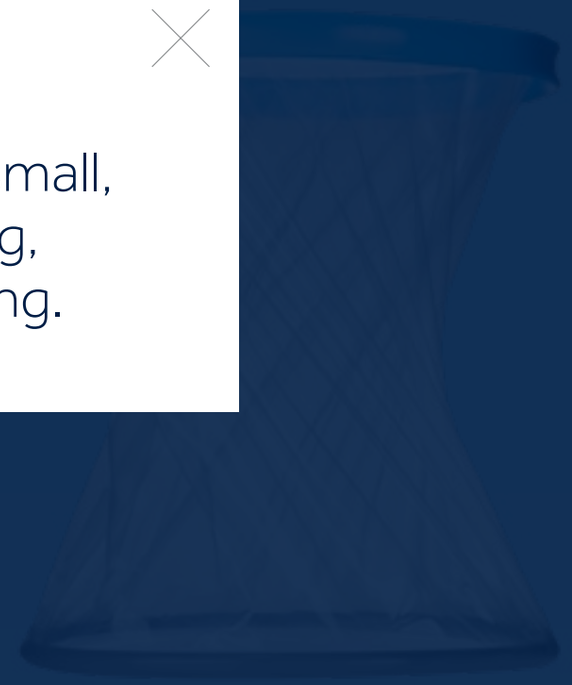

SPECIFICATIONS

Available in 5 sizes: extra-small, small, medium, large with retraction ring, and extra-large with retraction ring.

clinically significant reduction in incisional surgical site infections. The study concluded that barrier wound protection of this nature should be considered routine in this type of surgery.[2]

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6. Information in the table was based on (1) Survey of 29 General and OB/GYN surgeons of SurgiSleeve™ wound protector and Alexis™* O large and extra-large conducted during a product demonstration event Oct. 28–29, 2014 in San Francisco, CA; and (2) the animal labs for the large & extra-large ring with five general surgeons and three OB/GYN surgeons on Aug. 5–6 in the North Haven, CT, USA facility.
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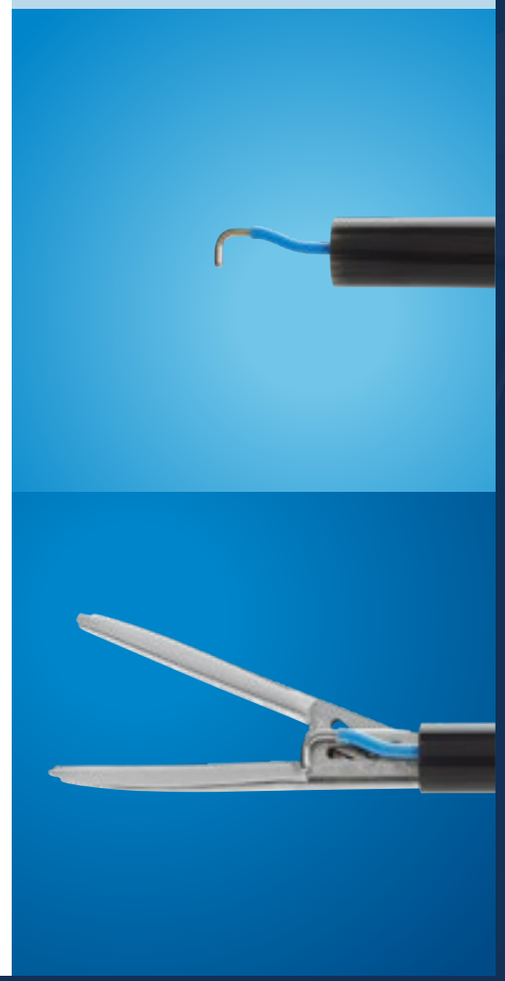
TECHNOLOGY

The only device of its kind, it delivers the benefits of[2]:

- Precise Valleylab™ monopolar dissection[1,†]
- One-step LigaSure™ vessel sealing[1,†]
- Atraumatic grasping[2]
- Cold cutting[2]
- Maryland-style blunt dissection[2]

†29 out of 29 surgeons evaluated agreed.



PERFORMANCE

CHALLENGE	SOLUTION
Laparoscopic colorectal procedures take time and require frequent position resets after instrument exchanges.	The LigaSure™ retractable L-hook device provides enhanced surgical flow due to one-step activation and decreased instrument exchanges.[1,†]
Colorectal cases often require access to tight spaces deep in the pelvis.	The LigaSure™ retractable L-hook device's tapered, curved jaw profile allows for access in tight spaces.[1,†]

†29 out of 29 surgeons evaluated agreed.

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LigaSure™ retractable L-hook laparoscopic sealer/divider

Sonicision™ cordless ultrasonic dissector

LigaSure™ Maryland jaw device

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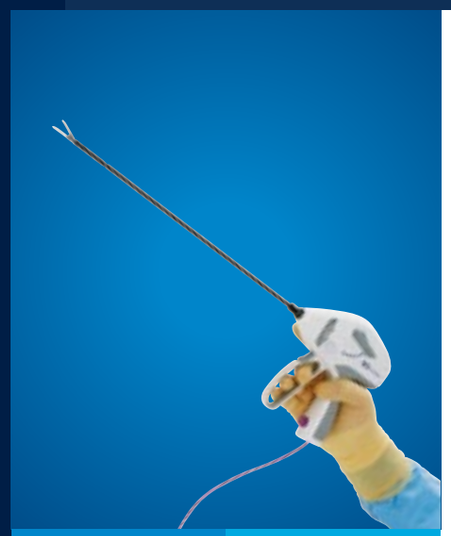
LigaSure™ Retractable L-Hook Laparoscopic Sealer/Divider



SPECIFICATIONS

LigaSure™ technology can seal:

- Vessels up to and including 7 mm
- Lymphatics
- Tissue bundles

Available in 37 cm and 44 cm sizes.

and Valleylab™ monopolar energy.

†29 out of 29 surgeons evaluated agreed.

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LigaSure™ Retractable L-Hook Laparoscopic Sealer/Divider

REFERENCES

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2. Based on internal test report #RE00032739 Rev A, LigaSure™ Hook (LF5637, LF5644) validation surgeon evaluation report: independent surgeon feedback collected during Medtronic-sponsored cadaver and porcine lab conducted in Houston, Texas. February 2016.

and Valleylab™ monopolar energy.

†29 out of 29 surgeons evaluated agreed.

TECHNOLOGY

Offering improved freedom of movement and[1–3]:

- Innovative cordless technology
- Rapid dissection of tissue and security of hemostasis for vessels up to 5 mm in diameter[4]
- Intuitive energy activation control improves focus on the procedure[1–3]

PERFORMANCE

CHALLENGE	SOLUTION
The growing popularity of laparoscopic and robotic procedures require additional equipment in the OR.	Sonicision™ cordless ultrasonic device eliminates a cord and it has been shown that the reduction of cords improves safety in the OR.[1]
Capital equipment requires planning and the appropriate budgets.	Sonicision™ cordless ultrasonic device platform is easy to adopt without a large capital outlay.

SPECIFICATIONS

Measure	Sonicision™ system	Ethicon Harmonic ACE™*†	Ethicon Harmonic ACE+™*‡	Olympus Thunderbeat™*§
Shaft length	13 cm 26 cm 39 cm 48 cm	14 cm 23 cm 36 cm 45 cm	23 cm 36 cm	10 cm 20 cm 35 cm 45 cm
Method of activation	Hand 1 button, 2 stages	Hand 2 buttons	Hand 2 buttons	Hand 2 buttons
Frequency	55.5 kHz	55.5 kHz	55.5 kHz	47.7 kHz
Jaw length	14.5 mm	11.1 mm	10.7 mm	16.5 mm
Total weight of device assembled (with cords and transducer)	394.25 g	337.47 g	341.86 g	386.86 g

†Ethicon Harmonic ACE™* instructions for use.
‡Ethicon Harmonic ACE+™* instructions for use.
§Olympus Thunderbeat™* instructions for use.

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TECHNOLOGY

Reliable vessel-sealing technology:

- Nonstick nano-coated jaws
- Enhanced blunt dissection compared to straight jaws[2,†]
- Improved tip visualization compared to straight jaws[3,‡]

The LigaSure™ Maryland jaw device (LF1944) reduces sticking by more than 38 times compared to the Ethicon ENSEAL™* G2 device.[4,§]

†23 of 32 surgeons surveyed agreed.
‡31 of 33 surgeons surveyed agreed.
§Tissue sticking to device jaws instances measure over 110 seals per device (ForceTriad™ energy platform).

PERFORMANCE

CHALLENGE	SOLUTION
Appropriate skeletonizaton of IMA is needed to allow confidence when sealing.	The curved jaws of the LigaSure™ Maryland jaw device allow for easy skeletonization of vessels.[3,†]
Mobilization of the colon requires dissection and vessel sealing which could create the need for frequent instrument exchanges.	The LigaSure™ Maryland jaw device is a one-step vessel sealer that provides the reliability, control, and consistency[2] of LigaSure™ technology.

†30 out of 33 surgeons surveyed agreed.

SPECIFICATIONS

	LigaSure™ Maryland jaw device	Ethicon Harmonic ACE+™*†
Seal plate length	20.3 mm	13.5 mm
Cut length	18.5 mm	13.5 mm
Jaw aperture	12.7 mm	11.5 mm
Vessel size	7 mm	5 mm
Curved jaw	Yes	Yes
Degrees of curve	22 degrees	17.4 degrees
Shaft lengths	23 cm, 37 cm, 44 cm	14 cm, 23 cm, 36 cm, 45 cm
Ability to cold cut	Yes	No

†Ethicon Harmonic ACE+™* instructions for use.

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- Cold scissors

LigaSure™
Maryland Jaw Device

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LigaSure™ retractable L-hook laparoscopic sealer/divider
Sonicision™ cordless ultrasonic dissector
LigaSure™ Maryland jaw device
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REFERENCES

1. Based on LigaSure™ Maryland Jaw Sealer/Divider, Nano-coated [instructions for use]. Boulder, CO: Medtronic; 2016.
2. Based on internal test report #R0035742, Maryland validation labs: Independent surgeon feedback collected during porcine labs in Houston and Los Angeles. April 16 to 18 and April 30 to May 3, 2013.
3. Based on internal test report #RE00071598. Maryland Validations Labs Marketing report. Houston and Los Angeles: independent surgeon feedback collected during porcine labs. April 16–18 and April 30–May 3, 2013.
4. Based on internal test report #RE00073194, Tissue sticking comparison of the Ethicon G2™*. Voyant™* 5 mm Fusion, LigaSure™ LF1737, and LigaSure™ LF1937 devices conducted on porcine tissue using the Force Triad™ energy platform. January 18, 2017.
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The Signia™ stapler:

- Delivers fully powered articulation, rotation, clamping, and firing to provide precision and maneuverability[1–3]
- Sets firing speed based on tissue clamped[1,4–6]
- Provides an OLED screen to display real-time feedback
- Allows for single-handed operation that frees your other hand when stapling and stay focused on the surgical site[1]

REFERENCES

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CHALLENGE	SOLUTION
Laparoscopic colorectal surgery is challenging — especially when trying to optimally position the stapler low in the pelvis.	Fully powered articulation, rotation, clamping, and firing provides greater precision and maneuverability compared to manual staplers.[1–3]
Poor staple formation is a risk in dense and variable tissues, especially in the colon and rectum following radiation therapy.	The Signia™ stapler adjusts firing speed based on force feedback during clamp and firing to optimize stapling formation and deliver consistent staple lines.[1,4–6]
It's difficult to know whether you have selected the right staple reload when visualization of the tissue is limited deep in the pelvis.	The Signia™ stapler displays real-time feedback on an easy-to-understand OLED screen.[1,7]
It can be difficult to adequately manage multiple instruments in a laparoscopic procedure.	The Signia™ stapler frees your other hand to focus on the surgical site.[1]

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Signia™ stapling system

Endo GIA™ reloads with Tri-Staple™ technology

Endo GIA™ radial reload with Tri-Staple™ technology

Endo GIA™ Ultra Universal stapler

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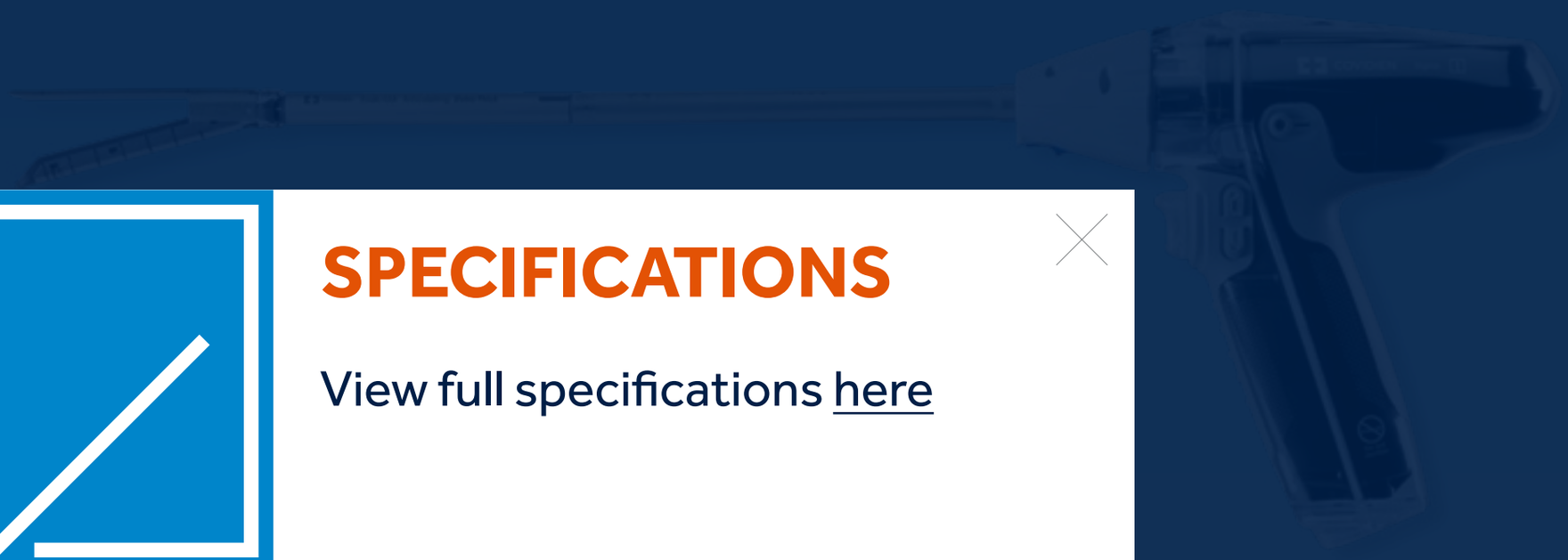
Signia™ Stapling System



SPECIFICATIONS

View full specifications here

Smart technology that gives you real-time feedback and powered rotation, articulation, and firing — with one hand.[1]

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2. Based on internal test report #R0033554, iDrive™ Ultra PCR summary report. November 2012.
3. Based on internal test report #RE00022065, UCONN biodynamics final report on results focusing on biomechanical exposure related to laparoscopic stapler use. 2012.
4. Based on internal engineering report #PCG022, Comparison of the iDrive™-S, iDrive™-F, Ethicon 60 and universal 60 staple formation in thick tissue stomach firings. January 2016.
5. Based on internal test report #R2146-173-0, ASA verification testing with slow speed force limit evaluation. 2015.
6. Based on internal test report #R2146-151-0, Powered stapling firing speed DOE analysis and ASA parameters. 2015.
7. PT00002451 Signia™ Stapler User Manual. Page 13. Minneapolis, MN: Medtronic, 2016.

TECHNOLOGY

Preserving tissue integrity is the ultimate premise behind the advanced Tri-Staple™ technology design. With its stepped cartridge face, fixed anvil, and varied height staples, Tri-Staple™ technology:

- Puts less stress on tissue during compression and clamping[1,†]
- Allows greater perfusion into the staple line[2,†]
- Provides superior performance in variable tissue thicknesses[3,†]

†Preclinical results may not correlate with clinical performance in humans.

LESS STRESS
on tissue during compression and clamping[1,†]

GREATER PERFUSION
into the staple line[2,†]

SUPERIOR PERFORMANCE
in variable tissue thicknesses[3,†]

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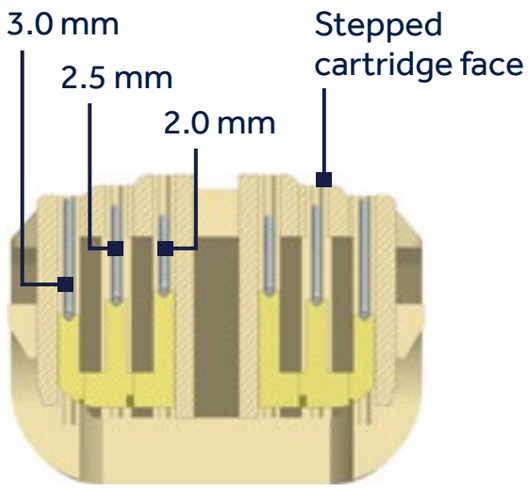
CHALLENGE	SOLUTION
Ischemia and reduced perfusion may contribute to anastomotic leaks.[7]	The profile of Tri-Staple™ technology design allows greater perfusion into the staple line when compared to conventional stapling technologies.[2,†]
Maintaining hemostasis while minimizing risk of ischemia during colorectal surgery is critical to reducing intraoperative blood loss.	Endo GIA™ reloads have a unique stepped cartridge face and their varied height staples approximate tissue to the appropriate tissue thickness to deliver superior performance in variable tissue.[3,†]
Poor staple formation is a risk in dense and variable tissues, especially in the colon and rectum following radiation therapy.	Reloads with Tri-Staple™ technology provide consistent performance over a broader range of tissue thicknesses due to its graduated compression profile.[3,†]

†Pre-clinical results may not correlate with clinical performance in humans.

SPECIFICATIONS

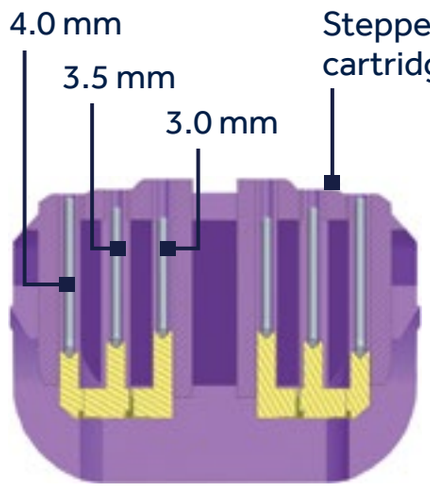
Vascular/medium tissue reload

Staple heights



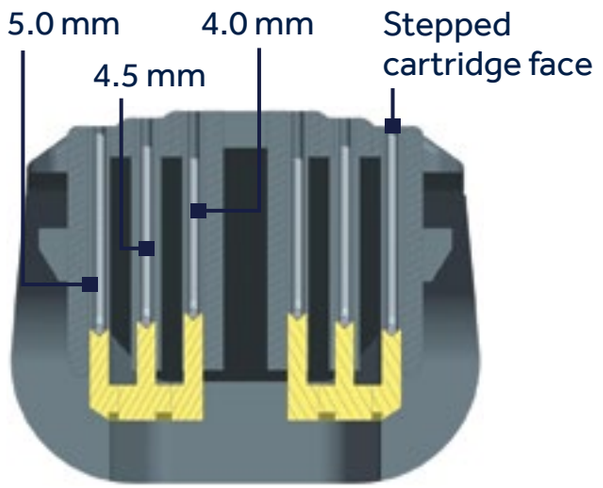
Medium/thick tissue reload

Staple heights



Extra-thick tissue reload

Staple heights



Reload	Outer row	Middle row	Inner row	Cut line	Inner row	Middle row	Outer row	Intended tissue thickness range
Tan	3.0 mm	2.5 mm	2.0 mm	| |	2.0 mm	2.5 mm	3.0 mm	0.88–1.8 mm
Purple	4.0 mm	3.5 mm	3.0 mm	| |	3.0 mm	3.5 mm	4.0 mm	1.55–2.25 mm
Black	5.0 mm	4.5 mm	4.0 mm	| |	4.0 mm	4.5 mm	5.0 mm	2.25–3.0 mm

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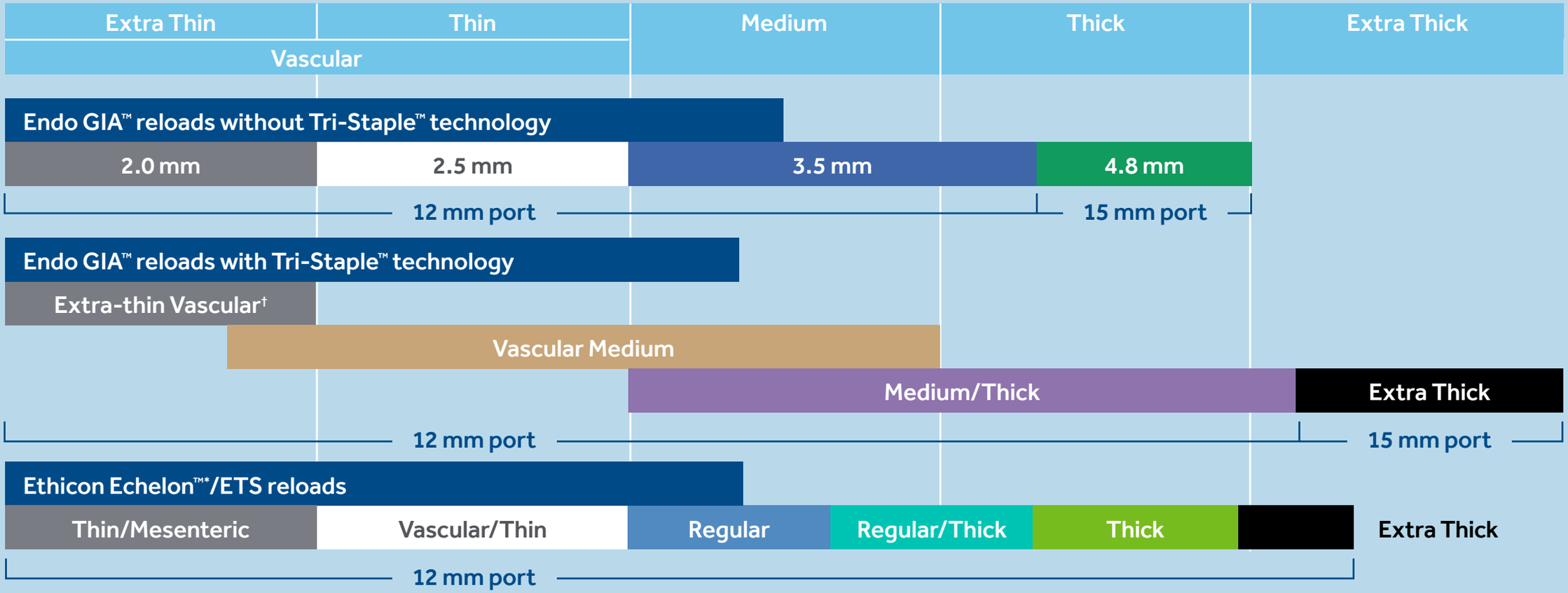
Grey reload	0.75–1.0 mm (extra-thin to vascular tissue)
Tan reload	0.88–1.8 mm (vascular to medium tissue)
Purple reload	1.5–2.25 mm (medium to thick tissue)
Black reload	2.25–3.0 mm (extra-thick tissue)

Reload Selection Chart



Extra-thin/Vascular reloads contain three rows of 2.0 mm staples (nonvaried height) and contains all of the other features and benefits of an Endo GIA™ reload with Tri-Staple™ technology.

† Preclinical results may not correlate with clinical performance in humans.

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Vascular/ medium tan reloads	Open	2.0 mm (.79")	2.5 mm (.098")	3.0 mm (.118")
	Closed	0.75 mm (.030")	1.0 mm (.039")	1.25 mm (.049")
	Backspan	3.0 mm (.118")	3.0 mm (.118")	3.0 mm (.118")
	Wire diameter	0.22 mm (.0085")	0.22 mm (.0085")	0.22 mm (.0085")
				
Medium/thick purple reloads	Open	3.0 mm (.118")	3.5 mm (.138")	4.0 mm (.157")
	Closed	1.25 mm (.049")	1.5 mm (.059")	1.75 mm (.069")
	Backspan	3.0 mm (.118")	3.0 mm (.118")	3.0 mm (.118")
	Wire diameter	0.22 mm (.0085")	0.22 mm (.0085")	0.24 mm (.0094")
				
Extra-thick black reloads	Open	4.0 mm (.157")	4.5 mm (.177")	5.0 mm (.197")
	Closed	1.75 mm (.069")	2.0 mm (.79")	2.25 mm (.089")
	Backspan	3.0 mm (.118")	3.0 mm (.118")	3.0 mm (.118")
	Wire diameter	0.24 mm (.0094")	0.24 mm (.0095")	0.24 mm (.0096")

REFERENCES

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2. Based on internal test report #2128-002-2, Final analysis of staple line vascularity using MicroCT. When compared to Ethicon ECHELON FLEX™* uniform staple reloads as part of a bench study conducted in murine models, the vascular volume was statistically superior with Tri-Staple™ technology reloads (p = .011). April 27, 2015.
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5. Based on internal test report #PCG-006, Staple Formation Comparison between Medtronic EGIA60AXT and Ethicon ECR60G in an Ex-Vivo Tissue Model (data on file at Medtronic). January 2012.
6. Based on internal test report #PCG-018, 2D FEA of Linear Staplers (data on file at Medtronic). November 2012.
7. Attard JA, Raval MJ, Martin GR, et al. The effects of systemic hypoxia on colon anastomotic healing: an animal model. *Dis Colon Rectum.* 2005 Jul;48(7):1460–1470.

TECHNOLOGY

In the right patient with sufficient space in the pelvis, the radial reload with its innovative profile offers:

- Deeper access in the pelvis in LAR procedures compared to Ethicon CONTOUR™* curved stapler[1]
- Better distal margins in rectal resections[1]
- Greater maneuverability and visibility in the pelvis[1]

Additionally, Tri-Staple™ technology delivers 6 rows of variable height staples and graduated compression that:

- Generates less stress during compression and clamping[2]
- May allow greater perfusion into the staple line[3]
- Provides superior performance in variable thicknesses[4–8]

LESS STRESS
on tissue during compression and clamping[2]

GREATER PERFUSION
into the staple line[3]

SUPERIOR PERFORMANCE
in variable tissue thicknesses[4–8]

PERFORMANCE

CHALLENGE	SOLUTION
Mobilization and division of the ultra-low/distal rectum is very challenging.	In a cadaver study, four surgeons found the radial reload allowed better visualization and lower access in the pelvis compared with Contour™*[1]
Proper distal rectal resection with clear margins are needed to decrease the risk of local recurrence and potentially increase the rate of sphincter salvage in patients with low rectal cancers.[1]	In a cadaver study, four surgeons found the radial reload allowed lower access in the pelvis compared with Contour™* in both the coronal and sagittal planes.[1] Distance was measured from the pelvic floor to device. View study **here.**
Poor staple formation is a risk in dense and variable tissues, especially in the rectum following radiation therapy.	The extra-thick black radial reload provides the thickest tissue LAR stapler on the market today.[9] The unique stepped cartridge face and varied height staples approximate tissue to the appropriate tissue thickness to deliver superior performance over a broader range of tissue thickness.[4–8]

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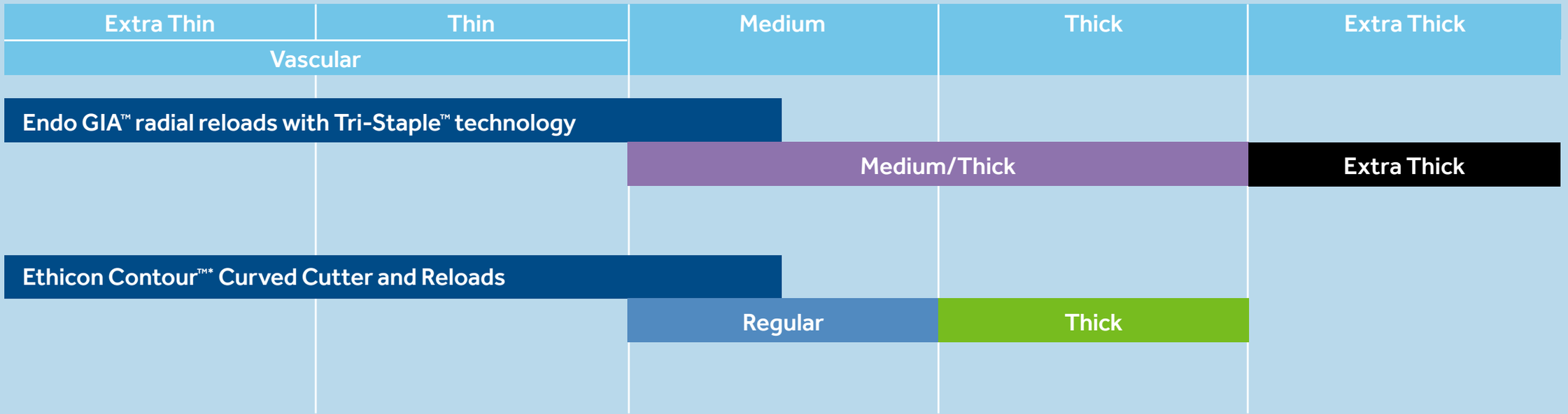
Reload Selection Chart



Ordering Information

Description	Cartridge color	Staple size (inner to outer row)
Endo GIA™ radial reload with Tri-Staple™ technology	Purple	3 mm, 3.5 mm, 4 mm
Endo GIA™ radial reload with Tri-Staple™ technology	Black	4 mm, 4.5 mm, 5 mm

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Competitive analysis: dimensions

Dimensions		
	Endo GIA™ radial reload	**Contour™***
Total length	535 mm	406 mm
Functional access length	320 mm	216 mm
Jaw opening	16.3 mm	19 mm
Head width	81 mm	64 mm
Linear staple line (from first staple to end of cut line)	50 mm	38 mm
Full curved staple line	60 mm	48 mm

Best practices:

- The radial reload has a unique design which necessitates a thorough in-service/discussion with each surgeon. This should be scheduled a few days prior to first clinical use, preferably outside of the OR when possible.
- There is a learning curve to using the device — namely becoming familiar with maneuverability options and insertion technique deep in the pelvis. In certain patients with a narrow pelvis, placement may be difficult. In the right patient, the unique geometry of the radial reload may enable the surgeon to get lower than Contour™* in an LAR procedure.[1]
- For the first 3–5 cases with the radial reload, be sure your surgeon selects "easier" cases (mid-to upper-rectal tumors in patients with a wider pelvis) that will allow him/her to get comfortable with all the nuances of the device. Once they have gained this experience, they will be fully ready to tackle the more difficult procedures.

REFERENCES

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5. Based on internal test report #PCG-006, Staple Formation Comparison between Medtronic EGIA60AXT and Ethicon ECR60G in an Ex-Vivo Tissue Model (data on file at Medtronic). January 2012.
6. Based on internal test report #PCG-018, 2D FEA of Linear Staplers (data on file at Medtronic). November 2012.
7. Based on internal test report #PCG-019, Comparative Test of Medtronic Endo GIA™ Black Reloads with Tri-Staple™ Technology and Ethicon ECHELON FLEX™* Black Reloads (data on file at Medtronic). June 2014.
8. Based on internal test report #PCG-007 rev 1, When compared to Ethicon ECHELON FLEX™* green reloads as part of an analysis comparing different stapler designs and their performance and impact on tissues under compression using two-dimensional finite element analysis. September 2, 2011.
9. Based on internal report # PCG-019, Comparative test of Endo GIA™ black reloads with Tri-Staple™ technology and Ethicon ECHELON FLEX™* black reloads. June 2014.

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The Endo GIA™ Ultra Universal stapler provides features such as:

- Three shaft lengths in short, standard, and XL
- Enhanced articulation with 10 points up to 45 degrees
- Forward/backward compatibility with all Endo GIA™ reloads

ONE-HANDED GRASPING MECHANISM

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PERFORMANCE

CHALLENGE	SOLUTION
Hand fatigue in manual stapling is challenging, especially when firing in awkward angles on thick tissue during colorectal surgery.	**Ergonomic design** The Endo GIA™ Ultra Universal stapler has a lightweight handle which fits comfortably in all hand sizes and fires smoothly, even in thick tissue.
Laparoscopic colorectal surgery is challenging — especially when trying to optimally position the stapler low in the pelvis.	**Precise articulation** The Endo GIA™ Ultra Universal stapler has up to 45 degree, controlled articulation, which allows for improved access to challenging anatomy.
It can be difficult to adequately manage multiple instruments in a laparoscopic procedure.	**One-handed grasping mechanism** The Endo GIA™ Ultra Universal stapler has jaws that can be opened and closed with one hand for precise grasping and manipulation of tissue.

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Product offering	Reorder code	Shaft length	Description
	EGIAUSHORT	6 cm	Endo GIA™ Ultra Universal short stapler
	EGIAUSTND	16 cm	Endo GIA™ Ultra Universal stapler
	EGIAUXL	26 cm	Endo GIA™ Ultra Universal XL stapler

one-handed grasping.

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TECHNOLOGY

Clinical confidence. Because it is proven technology.

The EEA™ circular stapler with Tri-Staple™ technology has advantages over two-row circular staplers because it:

- Puts less stress on tissue during compression and clamping[1,†]
- Allows greater perfusion into the staple line[2,†]
- Provides consistent staple performance over a broad range of tissue thicknesses compared to two row circular staplers[3–7]

†Preclinical results may not correlate with clinical performance in humans.

LESS STRESS
on tissue during compression and clamping[1,†]

GREATER PERFUSION
into the staple line[2,†]

SUPERIOR PERFORMANCE
in variable tissue thicknesses[3–7]

PERFORMANCE

CHALLENGE	SOLUTION
Ischemia and reduced perfusion may contribute to anastomotic leaks.[8]	EEA™ circular stapler with Tri-Staple™ technology may allow greater perfusion into the staple line compared to two-row circular staplers.[9,10,†]
Maintaining hemostasis while minimizing risk of ischemia during colorectal surgery is critical to reducing intraoperative blood loss.	EEA™ circular stapler with Tri-Staple™ technology generates less stress on tissue during compression and clamping compared to two-row circular staplers.[11,†]
Poor staple formation is a risk in dense and variable tissues, especially in the colon and rectum following radiation therapy.	EEA™ circular stapler with Tri-Staple™ technology provides 30 percent additional security to the staple line during the critical healing period compared to two-row circular staplers.[12–14]

†Preclinical results may not correlate with clinical performance in humans.

SPECIFICATIONS

Reorder code	Product description	Color	Staple size (inner to outer row)
TRIEEA28MT	EEA™ circular stapler with Tri-Staple™ technology 28 mm medium/thick	Purple	3.0 mm, 3.5 mm, 4.0 mm
TRIEEA31MT	EEA™ circular stapler with Tri-Staple™ technology 31 mm medium/thick	Purple	3.0 mm, 3.5 mm, 4.0 mm
TRIEEAXL33MT	EEA™ circular stapler XL length with Tri-Staple™ technology 33 mm medium/thick	Purple	3.0 mm, 3.5 mm, 4.0 mm

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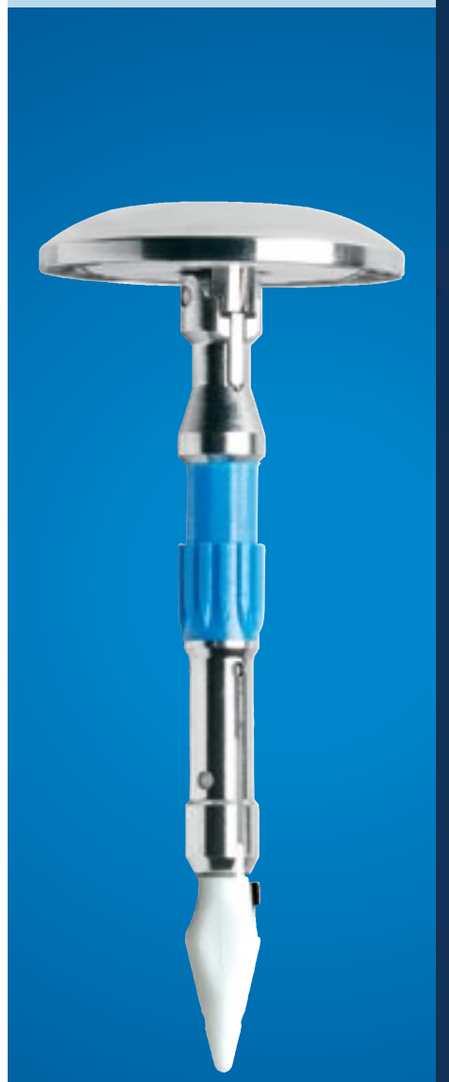
1. Based on internal test report #2128-002-2, Final analysis of staple line vascularity using MicroCT. When compared to Ethicon ECHELON FLEX™* uniform staple reloads as part of a bench study conducted in murine models, the vascular volume was statistically superior with Tri-Staple™ technology reloads (p = .011). April 27, 2015.
2. Based on internal test report #PCG-007 rev 1, When compared to ECHELON FLEX™* green reloads as part of an analysis comparing different stapler designs and their performance and impact on tissues under compression using two-dimensional finite element analysis. September 2, 2011.
3. Based on internal test report #PCG-004, Undercrimp comparisons in increasing pads of foam between Echelon™* and Tri-Staple™ technology (data on file at Medtronic). January 2012.
4. Based on internal test report #PCG-006, Staple Formation Comparison between Medtronic EGIA60AXT and Ethicon ECR60G in an Ex-Vivo Tissue Model (data on file at Medtronic). January 2012.
5. Based on internal test report #PCG-018, 2D FEA of Linear Staplers (data on file at Medtronic). November 2012.
6. Based on internal test report #PCG-019, Comparative Test of Medtronic Endo GIA™ Black Reloads with Tri-Staple™ Technology and Ethicon ECHELON FLEX™* Black Reloads (data on file at Medtronic). June 2014.
7. Based on internal test report #PCG-007 rev 1, When compared to ECHELON FLEX™* green reloads as part of an analysis comparing different stapler designs and their performance and impact on tissues under compression using two-dimensional finite element analysis. September 2, 2011.
8. Arrard JA, Raval MJ, Martin GR, et al. The effects of systemic hypoxia on colon anastomotic healing: an animal model. *Dis Colon Rectum.* 2005 Jul;48(7):1460–1470.
9. Based on extrapolation of perfusion studies performed for Endo GIA™ with Tri-Staple™ technology: internal test report #2128-002-2, Final analysis of staple line vascularity using MicroCT. April 27, 2015.
10. Based on internal test report #PCG-007, Media absorbency under clamped conditions. August 6, 2012.
11. Based on internal test report #PCG-30, Comparison of circular staplers: tissue compression profiles as determine by 2-D static axisymmetric finite element analysis (FEA).
12. Based on internal test report #2128-194, Comparison of EEA™ circular stapler with Tri-Staple™ technology to EEA™ circular stapler with DST Series™ technology in colo-colonic and gastro-jejunal anastomoses. August 20, 2015.
13. Based on internal test report #RE0036707, Pilot: comparison of EEA™ circular stapler with Tri-Staple™ technology to EEA™ circular stapler with DST Series™ technology in an esophago-gastrostomy using a canine model. February 25, 2015.
14. Based on internal test report #2128-097, Evaluation of early wound healing events in gastrojejunostomies and colonic anastomosis using a three row EEA™ stapler in canines. August 7, 2013.

TECHNOLOGY

The EEA™ stapler with DST Series™ technology provides:

- Confidence that comes from more than three decades of clinical experience in colorectal surgery
- Proprietary DST that improves staple formation due to its proprietary rectangular wire cross-section that ensures precise staple formation in challenging applications compared to traditional round wire cross-section[1]
- Versatile platform to include two lengths (standard and XL) the most important sizes in colon and rectum

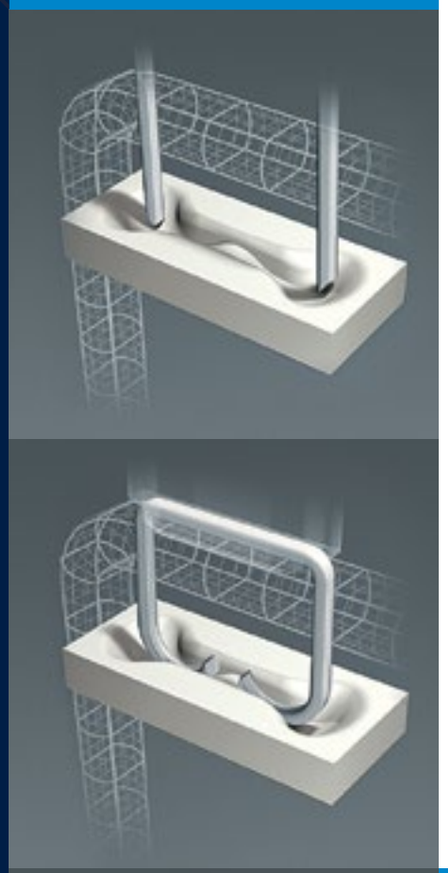


Medtronic

PERFORMANCE

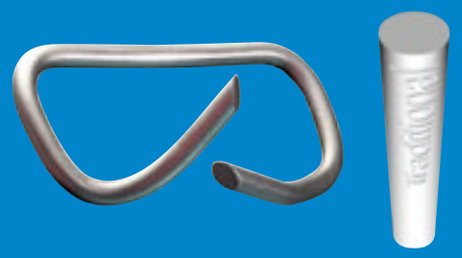
CHALLENGE	SOLUTION
Anastomotic leaks can lead to devastating outcomes. Confidence in proven performance and quality is imperative in this critical firing.	The EEA™ stapler with DST Series™ technology provides reliability, consistency and efficiency from three decades of experience and input from colorectal surgeons around the world.[1]
Poor staple formation is a risk in dense and variable tissues, especially in the colon and rectum following radiation therapy.	The EEA™ stapler with DST Series™ technology incorporates DST with rectangular wire cross-section that bends more reliably in the intended direction to improve staple formation in challenging applications compared to traditional round wire cross-section.[1,†]
Access to the anastomotic site can be difficult — especially in more proximal rectal lesions.	The EEA™ stapler with DST Series™ technology provides availability of XL length with a 17 percent longer shaft length (35 cm working length) than competitive models for improved access.[1]

†Preclinical results may not correlate with clinical performance in humans.



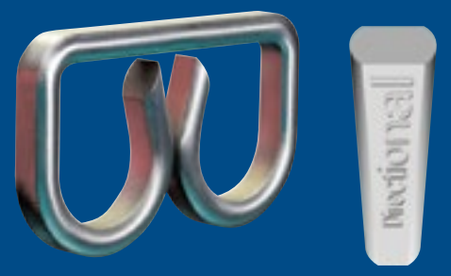
SPECIFICATIONS

Stapler	Product description	Color	Staple size
EEA21	EEA™ stapler with DST Series™ technology 21 mm stapler	Aqua	4.8
EEAXL21	EEA™ stapler with DST Series™ technology XL 21 mm stapler	Aqua	4.8
EEA2135	EEA™ stapler with DST Series™ technology 21 mm stapler with 3.5 mm staples	Aqua	3.5
EEAXL2135	EEA™ stapler with DST Series™ technology XL 21 mm stapler with 3.5 mm staples	Aqua	3.5
EEA25	EEA™ stapler with DST Series™ technology 25 mm stapler	White	4.8
EEAXL25	EEA™ stapler with DST Series™ technology XL 25 mm stapler	White	4.8
EEA2535	EEA™ stapler with DST Series™ technology 25 mm stapler with 3.5 mm staples	White	3.5
EEAXL2535	EEA™ stapler with DST Series™ technology XL 25 mm stapler with 3.5 mm staples	White	3.5
EEA28	EEA™ stapler with DST Series™ technology 28 mm stapler	Blue	4.8
EEAXL28	EEA™ stapler with DST Series™ technology XL 28 mm stapler	Blue	4.8
EEA2835	EEA™ stapler with DST Series™ technology 28 mm stapler with 3.5 mm staples	Blue	3.5
EEAXL2835	EEA™ stapler with DST Series™ technology XL 28 mm stapler with 3.5 mm staples	Blue	3.5
EEA31	EEA™ stapler with DST Series™ technology 31 mm stapler	Green	4.8
EEAXL31	EEA™ stapler with DST Series™ technology XL 31 mm stapler	Green	4.8
EEA33	EEA™ stapler with DST Series™ technology 33 mm stapler	Yellow	4.8
EEAXL33	EEA™ stapler with DST Series™ technology XL 33 mm stapler	Yellow	1.8
EEAORVIL21	EEA™ stapler with Orvil™ device 21 mm (compatible with XL stapler only)	Aqua	N/A
EEAORVIL25	EEA™ stapler with Orvil™ device 25 mm (compatible with XL stapler only)	White	N/A



TRADITIONAL STAPLE

Round wire cross-section is more prone to bending in any direction in challenging applications.[1]



DST SERIES™ TECHNOLOGY

Rectangular wire cross-section bends more reliably in the intended direction.[1]

EEA™ Stapler with DST Series™ Technology

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EEA™ circu
with Tri-Sta
technology

EEA™ stapl
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REFERENCE

1. Rodeheaver G, Internally sponsored study, Directional Stapling Technology (DST): improved reliability in staple formation in canine models (GIA™ Stapler with DST Series™ technology). 2006.

The EEA™ stapler with DST Series™ technology provides reliable and consistent performance backed by years of clinical experience.

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Polysorb™
Braided Absorbable Sutures

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V-Loc™ knotless wound closure device

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TECHNOLOGY

Polysorb™ sutures are composed of Lactomer™* copolymer, which is a synthetic polyester composed of glycolide and lactide (derived from glycolic and lactic acids). They are prepared by coating the suture with a mixture of a caprolactone/glycolide copolymer and calcium stearoyl lactylate.

absorbable suture is needed.

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

REFERENCES

Medtronic

PERFORMANCE

CHALLENGE

Wound dehiscence, which is estimated to occur in up to 3.5 percent of patients following surgery.

SOLUTION

The advanced extrusion process of the molecule of Lactomer™* 9-1, the exclusive braiding process, and coating system, give the suture increased strength during the critical wound healing period compared to VICRYL™* sutures,[1–4] and excellent knot security.[1,5,6]

Polysorb™
Braided Absorbable Sutures

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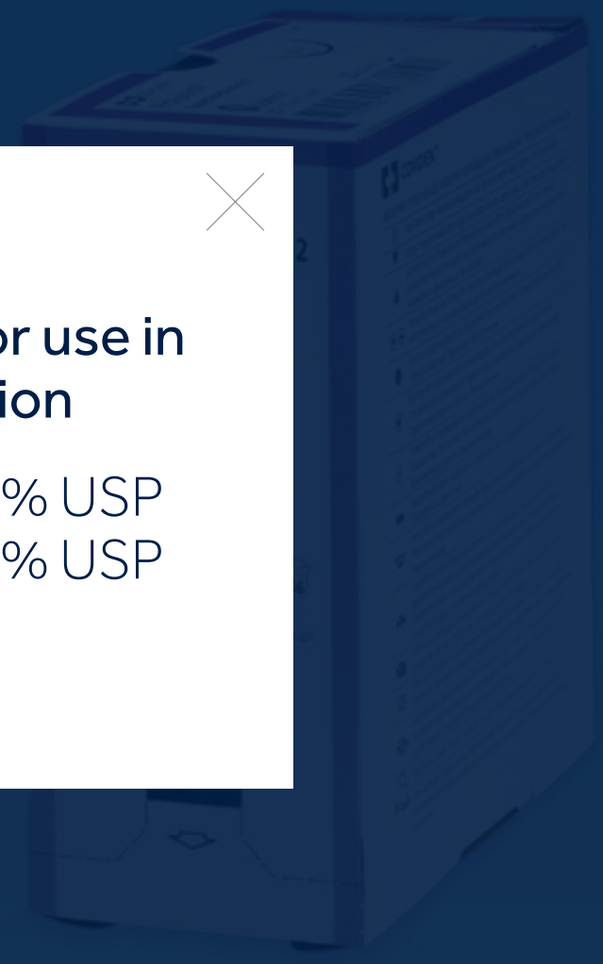
V-Loc™ knotless wound closure device

OPEN STEPS

SPECIFICATIONS

Polysorb™ sutures are indicated for use in soft tissue approximation or ligation

Tensile strength:	2 weeks: 80% USP 3 weeks: 30% USP
Absorption profile:	56–70 days



suture with applications in all surgical specialities where a strong absorbable suture is needed.

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REFERENCES

1. Based on internal test report #RE00081904 Polysorb benchmarking. 2013.
2. van Ramshorst GH, Nieuwenhuizen J, Hop WC, et al. Abdominal wound dehiscence in adults: development and validation of a risk model. *World J Surg.* 2010 Jan;34(1):20–27.
3. Ammirati CT, Goldman G. Wound closure materials and instruments. *Dermatology. 3rd Edition.* 2012, Elsevier Ltd.
4. Hsu A, Mustoe T. The principles of wound healing. *Plastic Surgery Secrets Plus. 2nd Edition.* 2010, Mosby Inc.
5. Debus ES, Geiger D, Sailer M, Ederer J, Thiede A. Physical, biological and handling characteristics of surgical suture material: A comparison of four different multifilament absorbable sutures. *Eur Surg Res.* 1997;29:52–61.
6. Faulkner B, Gear A, Hellewell T, et al. Biomechanical performance of a braided absorbable suture. *J Long Term Eff Med Implants.* 1996;6(3&4):169–179.

Biosyn™ Monofilament Absorbable Sutures

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OPEN STEPS

TECHNOLOGY

Biosyn™ monofilament absorbable sutures are prepared from Glycomer™* 631, a synthetic polyester composed of glycolide (60%), dioxanone (14%), and trimethylene carbonate (26%).

strength retention and absorption profiles to meet your surgical and tissue healing needs.

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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V-Loc™ Knotless
wound closure device

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PERFORMANCE

CHALLENGE

Maintaining tensile strength across the wound until tissue tensile strength is adequate.

SOLUTION

Biosyn™ monofilament absorbable suture strength (average knot pull) meets USP and EP specifications.[1]

tissue healing needs.

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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V-Loc™ knotless wound closure device

OPEN STEPS

SPECIFICATIONS

Biosyn™ sutures are indicated for use in general soft tissue approximation or ligation

Tensile strength:	2 weeks: 75% USP 3 weeks: 40% USP
Absorption profile:	90–110 days

strength retention and absorption profiles to meet your surgical and tissue healing needs.

Medtronic

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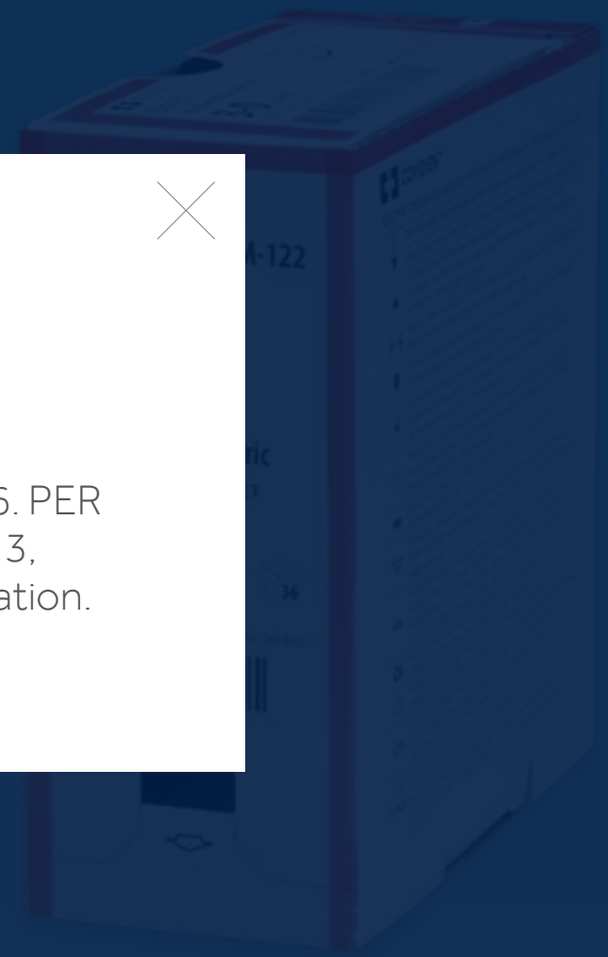

strength retention and absorption profiles to meet your surgical and tissue healing needs.

TECHNOLOGY
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Medtronic

REFERENCE

1. Based on internal report: SUT10181, SUT10182, SUT10183, SUT10184, SUT10185, SUT13059, SUT13060, and SUT13116. PER report Biosyn™ size 1 to 6-0 Bigfoot DQA qualification October 3, 2013. Clinical report Biosyn™ size 1 to 6–0 Bigfoot DQA qualification. February 14, 2014.

Maxon™
Monofilament Absorbable Sutures

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Maxon™ suture

V-Loc™ knotless wound closure device

OPEN STEPS

TECHNOLOGY

Maxon™ and Maxon™ CV monofilament polyglyconate synthetic absorbable sutures (clear or green) are prepared from a copolymer of glycolic acid and trimethylene carbonate.

monofilament absorbable sutures that provide excellent strength over the critical wound healing period.

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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wound closure device

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PERFORMANCE

CHALLENGE

Short-term absorbable sutures or sutures with insufficient tensile strength can cause post-operative fascial dehiscence and wound complications.

SOLUTION

Maxon™ long-term absorbable sutures tensile strength (average knot pull) meets USP and EP specifications.[1]

the critical wound healing period.

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V-Loc™ knotless wound closure device

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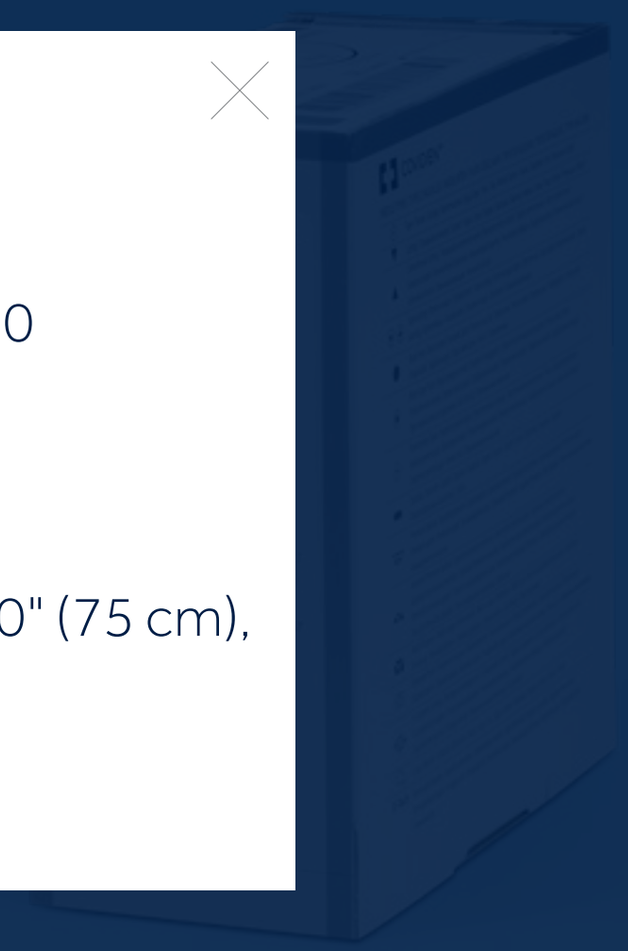
SPECIFICATIONS

Color:	Green, clear
HPIS code:	755_50_10_10
Latex free:	No
Product style:	Absorbable
Suture length:	24" (60 cm), 30" (75 cm), 36" (90 cm)
UNSPSC:	42312201



the critical wound healing period.

Maxon™
Monofilament Absorbable Sutures

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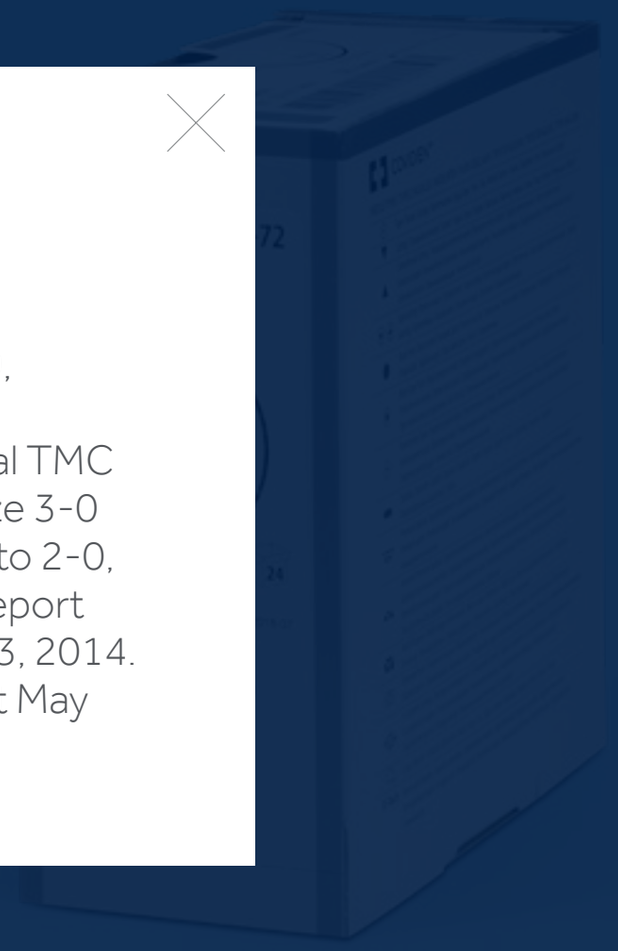

that provide excellent strength over the critical wound healing period.

REFERENCE

1. Based on Internal Report Number: RE00007428, RE00007429, SUT09014, SUT09017, SUT09018, SUT100001, SUT10092, SUT10094, SUT13134, SUT13142 & SUT13143. PER & Clinical TMC Supplier change BI to SA DQA Qualification Report Maxon™ Size 3-0 to 7-0 March 30, 2016. PER and Clinical Report Maxon™ Size 1 to 2-0, 3-0 to 6-0 DQA Qualification Report January 28, 2009. PER Report Maxon™ Size 1 to 6-0 DQA Bigfoot Qualification Report April 23, 2014. PER Report Maxon™ D-Tach Size 5-0 DQA Qualification Report May 09, 2014.

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TECHNOLOGY

The V-Loc™ device uses a dual-angle cut that creates an anchoring bar while optimizing the strand's integrity.

The V-Loc™ device has a unidirectional barb design that distributes tension across the wound. Meanwhile, circumferential barbs anchor tissue at numerous points, eliminating the need for knots.

V-Loc™
Knotless Wound
Closure Device

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CHALLENGE

Conventional sutures depend on knot integrity for security, and they can potentially cause knot-related complications.

SOLUTION

V-Loc™ knotless wound closure device means no need for knots. There's less risk for the ischemic tissue that can result from tying knots too tight.

closure for patients.

TECHNOLOGY

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SPECIFICATIONS

	V-Loc™ 90 absorbable device	V-Loc™ 180 absorbable device	V-Loc™ PBT nonabsorbable device
Tensile strength	7 days, 90%; 14 days, 75%	7 days, 80%; 14 days, 75%; 21 days, 65%	Permanent
Absorption profile	90–110 days	180 days	Permanent
Procedural applications	Soft tissue approximation where support is required consistent with the absorption profile	Soft tissue approximation where support is required consistent with the absorption profile	Soft tissue approximation
Color	Undyed, violet	Clear, green	Blue
			
Composition	Glycolide, dioxanone, and trimethylene carbonate	Copolymer of glycolic acid and trimethylene carbonate	Polybutester
Indications	V-Loc™ 90 device and V-Loc™ 180 absorbable wound closure devices are indicated for soft tissue approximation where use of an absorbable suture is appropriate	V-Loc™ 90 device and V-Loc™ 180 absorbable wound closure devices are indicated for soft tissue approximation where use of an absorbable suture is appropriate	V-Loc™ PBT nonabsorbable wound closure devices are indicated for soft tissue approximation

TECHNOLOGY

Reliable vessel-sealing technology:

- Nonstick nano-coated jaws
- Enhanced blunt dissection compared to straight jaws[2,†]
- Improved tip visualization compared to straight jaws[3,‡]

The LigaSure™ Maryland jaw device (LF1944) reduces sticking by more than 38 times compared to the Ethicon ENSEAL™* G2 device.[4,§]

†23 of 32 surgeons surveyed agreed.
‡31 of 33 surgeons surveyed agreed.
§Tissue sticking to device jaws instances measure over 110 seals per device (ForceTriad™ energy platform).

PERFORMANCE

CHALLENGE	SOLUTION
Appropriate skeletonizaton of IMA is needed to allow confidence when sealing.	The curved jaws of the LigaSure™ Maryland jaw device allow for easy skeletonization of vessels.[3,†]
Mobilization of the colon requires dissection and vessel sealing which could create the need for frequent instrument exchanges.	The LigaSure™ Maryland jaw device is a one-step vessel sealer that provides the reliability, control, and consistency[2] of LigaSure™ technology.

†30 out of 33 surgeons surveyed agreed.

SPECIFICATIONS

	LigaSure™ Maryland jaw device	Ethicon Harmonic ACE+™*
Seal plate length	20.3 mm	13.5 mm
Cut length	18.5 mm	13.5 mm
Jaw aperture	12.7 mm	11.5 mm
Vessel size	7 mm	5 mm
Curved jaw	Yes	Yes
Degrees of curve	22 degrees	17.4 degrees
Shaft lengths	23 cm, 37 cm, 44 cm	14 cm, 23 cm, 36 cm, 45 cm
Ability to cold cut	Yes	No

†Ethicon Harmonic ACE+™* instructions for use.

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LigaSure Impact™ open instrument
Sonicision™ cordless ultrasonic dissector
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REFERENCES

1. Based on LigaSure™ Maryland Jaw Sealer/Divider, Nano-coated [instructions for use]. Boulder, CO: Medtronic; 2016.
2. Based on internal test report #R0035742, Maryland validation labs: Independent surgeon feedback collected during porcine labs in Houston and Los Angeles. April 16 to 18 and April 30 to May 3, 2013.
3. Based on internal test report #RE00071598. Maryland Validations Labs Marketing report. Houston and Los Angeles: independent surgeon feedback collected during porcine labs. April 16–18 and April 30–May 3, 2013.
4. Based on internal test report #RE00073194, Tissue sticking comparison of the Ethicon G2™*. Voyant™* 5 mm Fusion, LigaSure™ LF1737, and LigaSure™ LF1937 devices conducted on porcine tissue using the Force Triad™ energy platform. January 18, 2017.
5. Based on internal test report #RE00140529 rev. A, LigaSure™ Maryland device, nano-coated (LF19XX) tissue testing (memo). March 5, 2018.

TECHNOLOGY

Innovative nonstick, nano-coating on large device jaws:

- Results in less cleaning during the procedure than the legacy device (LF4318)[2,†]
- Makes cleaning more efficient during the procedure than the legacy device (LF4318)[2,†]

The LigaSure Impact™ device (LF4418) has been shown to have 39 percent fewer less sticking instances than the Ethicon ENSEAL™* G2 Super Jaw.[3,‡]

†Cleaning effectiveness assessed using porcine uterine tissue, a wet gauze cleaning fixture, and optical imaging analysis after each of 2 cleaning cycles.
‡Tissue sticking to device jaws instances measured over 110 seals per device (ForceTriad™ energy platform).

PERFORMANCE

CHALLENGE	SOLUTION
Eschar buildup can: ▪ Cause jaws to stick ▪ Require multiple cleanings that disrupt procedural flow	The LigaSure Impact™ device reduces eschar buildup by 50 percent compared to the legacy device (LF4318), bringing greater efficiency to the operating room (OR).[2]
Efficient transection of the mesentery requires the ability to take large bites of tissue.	The LigaSure Impact™ device (LF4418) enables fast tissue transection.[1]

LigaSure Impact™ Curved Large Jaw Sealer/ Divider, Nano-coated

SPECIFICATIONS

LigaSure™ technology can seal:

- Vessels up to and including 7 mm
- Lymphatics
- Tissue bundles

Shaft length:	18 cm
Seal length:	36 mm
Cut length:	34 mm
Shaft rotation:	180 degrees

LigaSure Impact™ Curved Large Jaw Sealer/ Divider, Nano-coated

REFERENCES

1. Based on internal test report #RE00052321, Lig-40 marketing report surgeon evaluation of LigaSure Impact™ device LF4418; independent surgeon feedback collected during Medtronic sponsored porcine labs. June 21–22, 2016.
2. Based on internal benchtop testing #RE00057355, Lig-40 Report LF4418. July 29, 2016.
3. Based on internal benchtop testing #RE00055066, LigaSure™ LF4318, and LigaSure™ LF4418 devices; using porcine uterine tissue, tissue sticking comparison of the Ethicon™* G2 Super Jaw, Olympus ThunderBeat™*. August 2, 2016.

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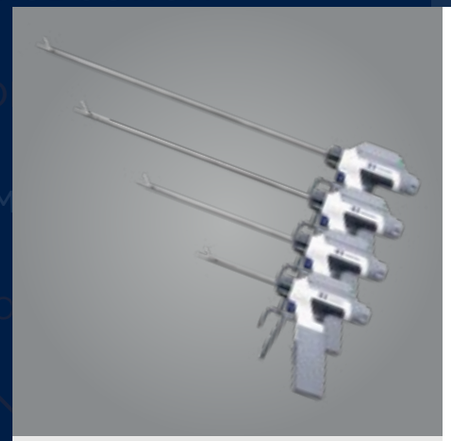
Offering improved freedom of movement and[1–3]:

- Innovative cordless technology
- Rapid dissection of tissue and security of hemostasis for vessels up to 5 mm in diameter[4]
- Intuitive energy activation control improves focus on the procedure[1–3]

PERFORMANCE

CHALLENGE	SOLUTION
The growing popularity of laparoscopic and robotic procedures require additional equipment in the OR.	Sonicision™ cordless ultrasonic device eliminates a cord and it has been shown that the reduction of cords improves safety in the OR.[1]
Capital equipment requires planning and the appropriate budgets.	Sonicision™ cordless ultrasonic device platform is easy to adopt without a large capital outlay.



SPECIFICATIONS

Measure	Sonicision™ system	Ethicon Harmonic ACE™*†	Ethicon Harmonic ACE+™*‡	Olympus Thunderbeat™*§
Shaft length	13 cm 26 cm 39 cm 48 cm	14 cm 23 cm 36 cm 45 cm	23 cm 36 cm	10 cm 20 cm 35 cm 45 cm
Method of activation	Hand 1 button, 2 stages	Hand 2 buttons	Hand 2 buttons	Hand 2 buttons
Frequency	55.5 kHz	55.5 kHz	55.5 kHz	47.7 kHz
Jaw length	14.5 mm	11.1 mm	10.7 mm	16.5 mm
Total weight of device assembled (with cords and transducer)	394.25 g	337.47 g	341.86 g	386.86 g

†Ethicon Harmonic ACE™* instructions for use.
‡Ethicon Harmonic ACE+™* instructions for use.
§Olympus Thunderbeat™* instructions for use.

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LigaSure Impact™ open instrument
Sonicision™ cordless ultrasonic dissector
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REFERENCES

1. Based on internal report #R0015050, CCR review for project Milwaukee. Nov. 21, 2013.
2. Based on internal test report #R0014853 Rev A. Usability validation report surgical evaluation of Milwaukee: independent surgeon feedback collected during internally-sponsored cadaver and porcine labs. April 2010 and May 2010.
3. Based on internal report #2-108-10, Validation of Milwaukee USG1, 5 mm cordless laparoscopic ultrasonic shears. April–May, 2010.
4. Tsirline VB, Lau KN, Swan RZ, et al. Evaluation of an innovative, cordless ultrasonic dissector. *Surg Innov.* 2013 Oct;20(5):524–529.
5. Brogmus G, Leone W, Butler L, Hernandez E. Best practices in OR suite layout and equipment choices to reduce slips, trips, and falls. *AORN J.* 2007;86(3):384–394.

TECHNOLOGY

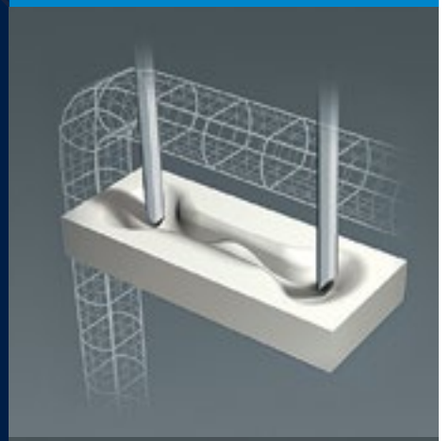
DST provides reliability in staple formation during open colorectal surgery:

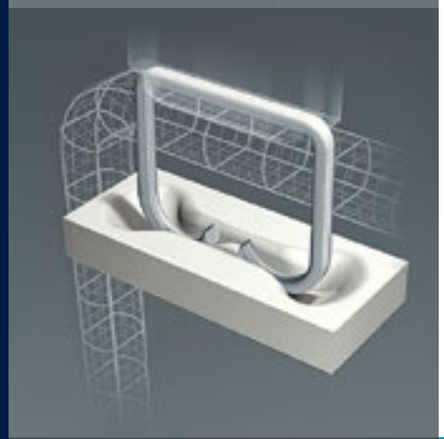
- Available in 3 staple sizes (2.5 mm, 3.8 mm, and 4.8 mm) to accommodate various tissue thicknesses in the colon and rectum.
- Has a parallel jaw closure with retention pin to ensure consistent B-shaped staples.
- With a strong, low profile anvil, and convenient cutting guide, to optimize access deep in the pelvis.
- Can be reloaded up to 7 times for a total of 8 firings per instrument.

STRONG, LOW-PROFILE ANVIL WITH CONVENIENT CUTTING GUIDE OPTIMIZES ACCESS DEEP IN THE PELVIS

PERFORMANCE

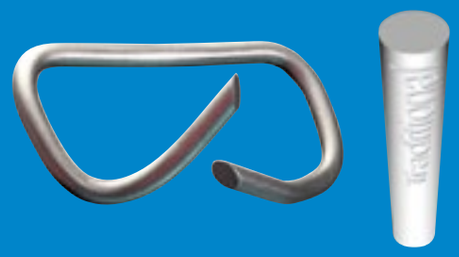
CHALLENGE	SOLUTION
Poor staple formation is a risk in dense and variable tissues, especially in the colon and rectum following radiation therapy.	Proven DST Series™ staple geometry provides improved superiority in staple strength.[1]
Precise stapler positioning can be difficult deep in the pelvis.	The TA™ stapler with DST Series™ technology offers a strong, low profile anvil which provides optimum access without deflection.
Positioning and clamping a stapler on thick tissues can be challenging.	The TA™ stapler has a dual action handle with tactile feedback: first squeeze for closing, second squeeze for firing stapler.





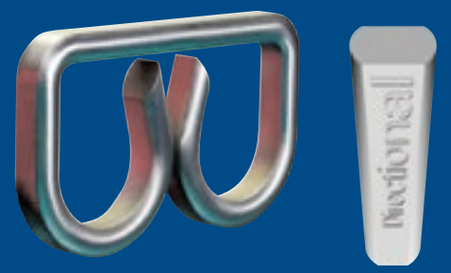
SPECIFICATIONS

TA™ stapler with DST Series™ technology code	Product description	Cartridges available	Staple length before closure	Staple leg length closed	Color	Number of reloads/total number of firings	Number of staples	Staple cross section	Rows of staples
TA30V3S	30 mm	TA30V3L	2.5 mm	1.0 mm	White	7/8	23	.18 x .27 mm	3
TA3035S	30 mm	TA3035L	3.5 mm	1.5 mm	Blue	7/8	11	.19 x .30 mm	2
TA3048S	30 mm	TA3048L	4.8 mm	2.0 mm	Green	7/8	11	.24 x .35 mm	2
TA4535S	45mm	TA4535L	3.5 mm	1.5 mm	Blue	7/8	15	.19 x .30 mm	2
TA4548S	45 mm	TA4548L	4.8 mm	2.0 mm	Green	7/8	15	.24 x .35 mm	2
TA6035S	60 mm	TA6035L	3.5 mm	1.5 mm	Blue	7/8	21	.19 x .30 mm	2
TA6048S	60 mm	TA6048L	4.8 mm	2.0 mm	Green	7/8	21	.24 x .35 mm	2
TA9035S	90 mm	TA9035L	3.5 mm	1.5 mm	Blue	7/8	33	.19 x .30 mm	2
TA9048S	90 mm	TA9048L	4.8 mm	2.0 mm	Green	7/8	33	.24 x .35 mm	2



TRADITIONAL STAPLE

Round wire cross-section is more prone to bending in any direction in challenging applications.[1]



DST SERIES™ TECHNOLOGY

Rectangular wire cross-section bends more reliably in the intended direction.[1]

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TA™ staple
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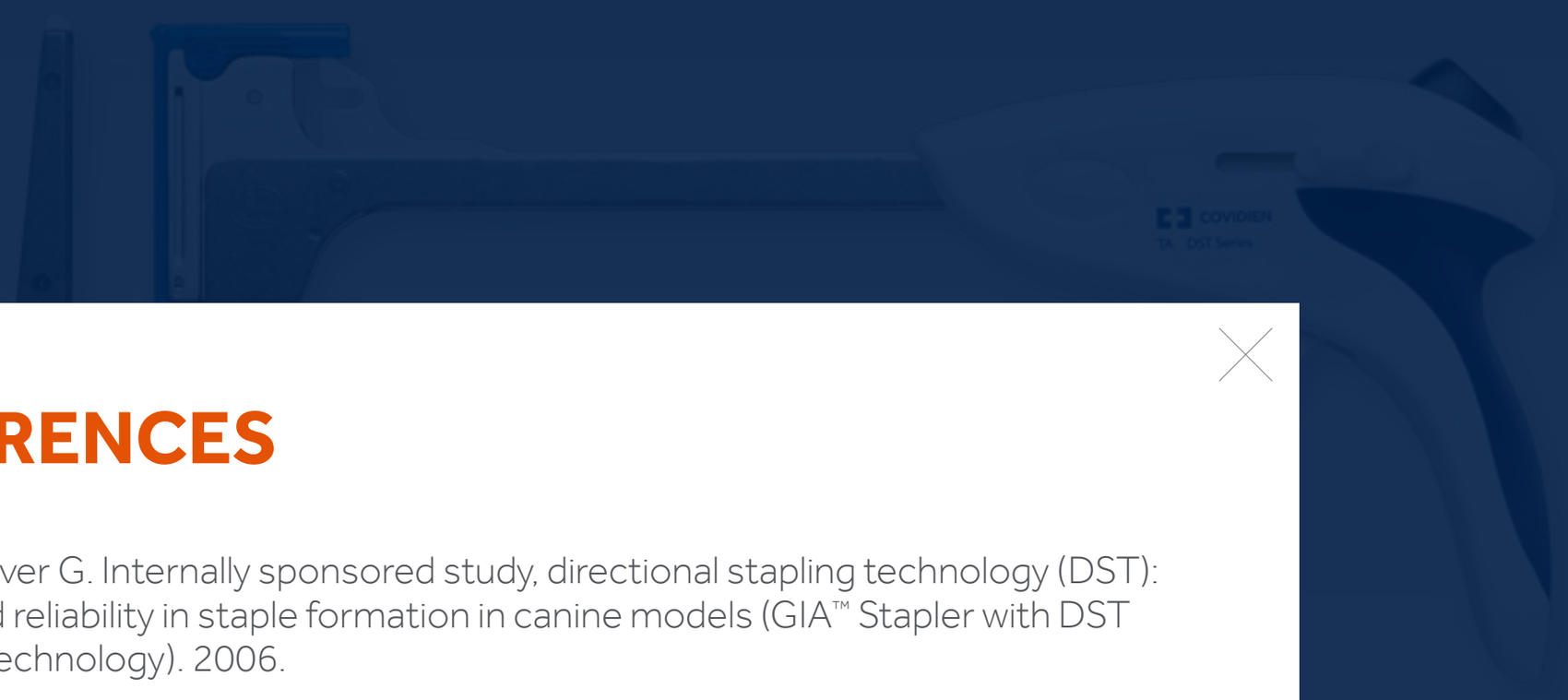
TA™ Stapler with DST Series™ Technology



REFERENCES

1. Rodeheaver G. Internally sponsored study, directional stapling technology (DST): improved reliability in staple formation in canine models (GIA™ Stapler with DST Series™ technology). 2006.

A reloadable linear stapler that places one double staggered row of titanium staples to occlude tissue during open colorectal surgery.

TECHNOLOGY

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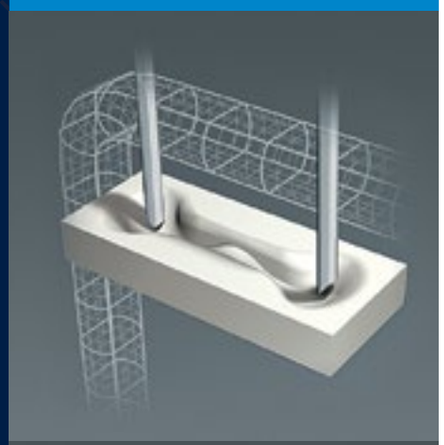
DST provides reliability in staple formation during open colorectal surgery

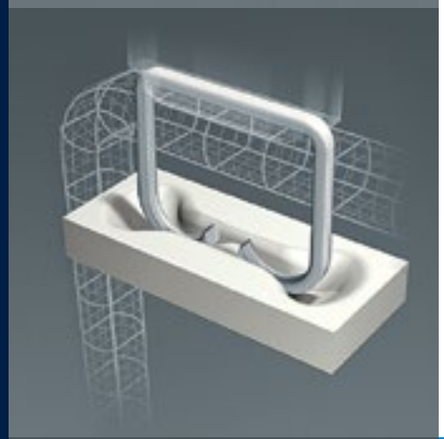
Features include:

- Availability in 3 staple sizes (2.5 mm, 3.8 mm, and 4.8 mm) to accommodate various tissue thicknesses in the colon and rectum
- Ability to be reloaded up to 7 times for a total of 8 firings per instrument

PERFORMANCE

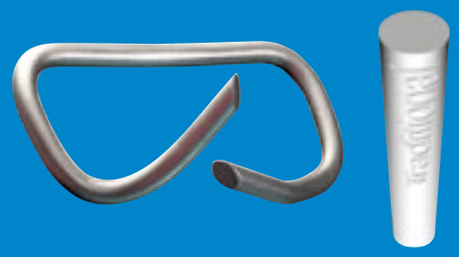
CHALLENGE	SOLUTION
Poor staple formation is a risk in dense and variable tissues, especially in the colon and rectum following radiation therapy.	Proven DST Series™ staple geometry provides improved superiority in staple strength.[1]
Precise stapler positioning can be difficult in tight spaces.	The GIA™ stapler has an adjustable firing knob giving surgeons the ability to fire from either side of the instrument.
Positioning and clamping a stapler on thick tissues can be challenging.	The GIA™ stapler offers a rear or center hinge clamping for one handed positioning.
Cartridges can be "prefired" when handling prior to loading, rendering the cartridge inoperable adding time, and cost to the procedure.	The GIA™ stapler has a safety lockout which prevents accidental prefiring before clamping.





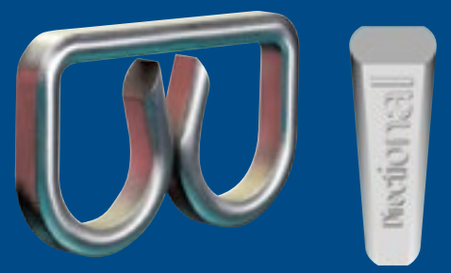
SPECIFICATIONS

GIA™ stapler with DST Series™ technology	Product description	Cartridges available	Staple length before closure	Approx. staple height closed	Color coded	Number of reloads/ total number of firings	Number of staples	Staple cross section	Rows of staples	Length of staple line
GIA6025S	60 mm	GIA6025L	2.5 mm	1.0 mm	White	7/8	64	.18 x .27 mm	4	64 mm
GIA6038S	60 mm	GIA6038L	3.8 mm	1.5 mm	Blue	7/8	64	.19 x .30 mm	4	64 mm
GIA6048S	60 mm	GIA6048L	4.8 mm	2.0 mm	Green	7/8	64	.24 x .35 mm	4	64 mm
GIA8038S	80 mm	GIA8038L	3.8 mm	1.5 mm	Blue	7/8	84	.19 x .30 mm	4	84 mm
GIA8048S	80 mm	GIA8048L	4.8 mm	2.0 mm	Green	7/8	84	.24 x .35 mm	4	84 mm
GIA10038S	100 mm	GIA10038L	3.8 mm	1.5 mm	Blue	7/8	104	.19 x .30 mm	4	104 mm
GIA10048S	100 mm	GIA10048L	4.8 mm	2.0 mm	Green	7/8	104	.24 x .35 mm	4	104 mm



TRADITIONAL STAPLE

Round wire cross-section is more prone to bending in any direction in challenging applications.[1]



DST SERIES™ TECHNOLOGY

Rectangular wire cross-section bends more reliably in the intended direction.[1]

GIA™ Stapler with DST Series™ Technology

REFERENCES

1. Rodeheaver G. Internally sponsored study, Directional stapling technology (DST): improved reliability in staple formation in canine models (GIA™ Stapler with DST Series™ technology). 2006.

with our proprietary DST

A reloadable linear stapler that places two double-staggered rows of titanium staples and simultaneously cuts and divides tissue during open colorectal surgery.

TECHNOLOGY

SurgiSleeve™ wound protector provides optimal exposure and wound protection in surgical cases

SurgiSleeve™ wound protectors:

- Are superior in film strength to Alexis™* wound protector/retractors[1]
- Offer equivalent or greater exposure versus Alexis™* O with a retraction ring in the large and extra-large sizes as rated by 98 percent of surgeons surveyed[3,4]
- Are available with large and extra-large retraction rings that are fast to place and remove[5]
- Are faster to roll down compared to Alexis™* O as rated by a majority of surgeons surveyed[6]
- Come in 5 SKUs to cover all your wound protection needs versus 15 SKUs for Alexis™* O wound protector/retractor

PERFORMANCE

CHALLENGE	SOLUTION
Sufficient retraction at incision site.[5,7–10]	SurgiSleeve™ wound protector has a blue proximal ring that is not only easier to roll down compared to Alexis™* O, but can be rolled down by just one person.†
Adequate exposure to the body.[5,7–10]	SurgiSleeve™ wound protector has a retraction ring (large and extra-large sizes) providing optimal retraction and visibility compared to Alexis™* O and a stable platform for access to the body.[6]
Potential for wound contamination.[5,7–10]	SurgiSleeve™ wound protector has three times stronger film material[1] compared to Alexis™* O offering optimal wound protection.

†Survey of 29 General and OB/GYN surgeons of SurgiSleeve™ Wound Protector and Alexis®* O conducted during a product demonstration event October 28–29, 2014 in San Francisco, CA.

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TA™ stapler with DST Series™ technology

GIA™ stapler with DST Series™ technology

SurgiSleeve™ wound protector

ANASTOMOSIS

CLOSURE

SurgiSleeve™ Wound Protector

Maximized exposure. Wound protection. Superior strength.[1]

SPECIFICATIONS

Available in 5 sizes: extra-small, small, medium, large with retraction ring, and extra-large with retraction ring.

clinically significant reduction in incisional surgical site infections. The study concluded that barrier wound protection of this nature should be considered routine in this type of surgery.[2]

REFERENCES

1. Based on internal report #2151-002, Comparison of mean film material strengths between SurgiSleeve™ wound protector and Alexis™* wound protector, as part of a puncture resistance material evaluation conducted on February 9, 2012. Statistically significant results p = 0.004.
2. Reid K, Pockney P, Draganic B, Smith SR. Barrier wound protection decreases surgical site infection in open elective colorectal surgery: A randomized clinical trial. *Dis Colon Rectum.* 2010; 53: 1374–1380.
3. Based on internal report #2151-021, SurgiSleeve™ large wound protector with retraction ring equivalence testing. October 30, 2014, and
4. Based on internal report #2151-023, SurgiSleeve™ extra-large wound protector with retraction ring equivalence testing. November 4, 2014.
5. Voice-of-the-customer survey of 29 general and OB/GYN surgeons of SurgiSleeve™ wound protector and Alexis™* O large and extra-large conducted during a product demonstration event, October 28–29, 2014, in San Francisco, CA.
6. Information in the table was based on (1) Survey of 29 General and OB/GYN surgeons of SurgiSleeve™ wound protector and Alexis™* O large and extra-large conducted during a product demonstration event Oct. 28–29, 2014 in San Francisco, CA; and (2) the animal labs for the large & extra-large ring with five general surgeons and three OB/GYN surgeons on Aug. 5–6 in the North Haven, CT, USA facility.
7. Edwards JP, Ho AL, Tee MC, Dixon E, Ball CG. Wound protectors reduce surgical site infection: a meta-analysis of randomized controlled trials. *Ann Surg.* 2012; 256(1): 53–59.
8. Horiuchi T, Tanishima H, Tamagawa K, et al. A wound protector shields incision sites from bacterial invasion. *Surg Infect (Larchmt).* 2010;11(6):501–503.
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TECHNOLOGY

Clinical confidence. Because it is proven technology.

The EEA™ circular stapler with Tri-Staple™ technology has advantages over two-row circular staplers because it:

- Puts less stress on tissue during compression and clamping[1,†]
- Allows greater perfusion into the staple line[2,†]
- Provides consistent staple performance over a broad range of tissue thicknesses compared to two row circular staplers[3–7]

†Preclinical results may not correlate with clinical performance in humans.

LESS STRESS
on tissue during compression and clamping[1,†]

GREATER PERFUSION
into the staple line[2,†]

SUPERIOR PERFORMANCE
in variable tissue thicknesses[3–7]

PERFORMANCE

CHALLENGE	SOLUTION
Ischemia and reduced perfusion may contribute to anastomotic leaks.[8]	EEA™ circular stapler with Tri-Staple™ technology may allow greater perfusion into the staple line compared to two-row circular staplers.[9,10,†]
Maintaining hemostasis while minimizing risk of ischemia during colorectal surgery is critical to reducing intraoperative blood loss.	EEA™ circular stapler with Tri-Staple™ technology generates less stress on tissue during compression and clamping compared to two-row circular staplers.[11,†]
Poor staple formation is a risk in dense and variable tissues, especially in the colon and rectum following radiation therapy.	EEA™ circular stapler with Tri-Staple™ technology provides 30 percent additional security to the staple line during the critical healing period compared to two-row circular staplers.[12–14]

†Preclinical results may not correlate with clinical performance in humans.

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Reorder code	Product description	Color	Staple size (inner to outer row)
TRIEEA28MT	EEA™ circular stapler with Tri-Staple™ technology 28 mm medium/thick	Purple	3.0 mm, 3.5 mm, 4.0 mm
TRIEEA31MT	EEA™ circular stapler with Tri-Staple™ technology 31 mm medium/thick	Purple	3.0 mm, 3.5 mm, 4.0 mm
TRIEEAXL33MT	EEA™ circular stapler XL length with Tri-Staple™ technology 33 mm medium/thick	Purple	3.0 mm, 3.5 mm, 4.0 mm

Medtronic

REFERENCES

1. Based on internal test report #2128-002-2, Final analysis of staple line vascularity using MicroCT. When compared to Ethicon ECHELON FLEX™* uniform staple reloads as part of a bench study conducted in murine models, the vascular volume was statistically superior with Tri-Staple™ technology reloads (p = .011). April 27, 2015.
2. Based on internal test report #PCG-007 rev 1, When compared to ECHELON FLEX™* green reloads as part of an analysis comparing different stapler designs and their performance and impact on tissues under compression using two-dimensional finite element analysis. September 2, 2011.
3. Based on internal test report #PCG-004, Undercrimp comparisons in increasing pads of foam between Echelon™* and Tri-Staple™ technology (data on file at Medtronic). January 2012.
4. Based on internal test report #PCG-006, Staple Formation Comparison between Medtronic EGIA60AXT and Ethicon ECR60G in an Ex-Vivo Tissue Model (data on file at Medtronic). January 2012.
5. Based on internal test report #PCG-018, 2D FEA of Linear Staplers (data on file at Medtronic). November 2012.
6. Based on internal test report #PCG-019, Comparative Test of Medtronic Endo GIA™ Black Reloads with Tri-Staple™ Technology and Ethicon ECHELON FLEX™* Black Reloads (data on file at Medtronic). June 2014.
7. Based on internal test report #PCG-007 rev 1, When compared to ECHELON FLEX™* green reloads as part of an analysis comparing different stapler designs and their performance and impact on tissues under compression using two-dimensional finite element analysis. September 2, 2011.
8. Arrard JA, Raval MJ, Martin GR, et al. The effects of systemic hypoxia on colon anastomotic healing: an animal model. *Dis Colon Rectum.* 2005 Jul;48(7):1460–1470.
9. Based on extrapolation of perfusion studies performed for Endo GIA™ with Tri-Staple™ technology: internal test report #2128-002-2, Final analysis of staple line vascularity using MicroCT. April 27, 2015.
10. Based on internal test report #PCG-007, Media absorbency under clamped conditions. August 6, 2012.
11. Based on internal test report #PCG-30, Comparison of circular staplers: tissue compression profiles as determine by 2-D static axisymmetric finite element analysis (FEA).
12. Based on internal test report #2128-194, Comparison of EEA™ circular stapler with Tri-Staple™ technology to EEA™ circular stapler with DST Series™ technology in colo-colonic and gastro-jejunal anastomoses. August 20, 2015.
13. Based on internal test report #RE0036707, Pilot: comparison of EEA™ circular stapler with Tri-Staple™ technology to EEA™ circular stapler with DST Series™ technology in an esophago-gastrostomy using a canine model. February 25, 2015.
14. Based on internal test report #2128-097, Evaluation of early wound healing events in gastrojejunostomies and colonic anastomosis using a three row EEA™ stapler in canines. August 7, 2013.

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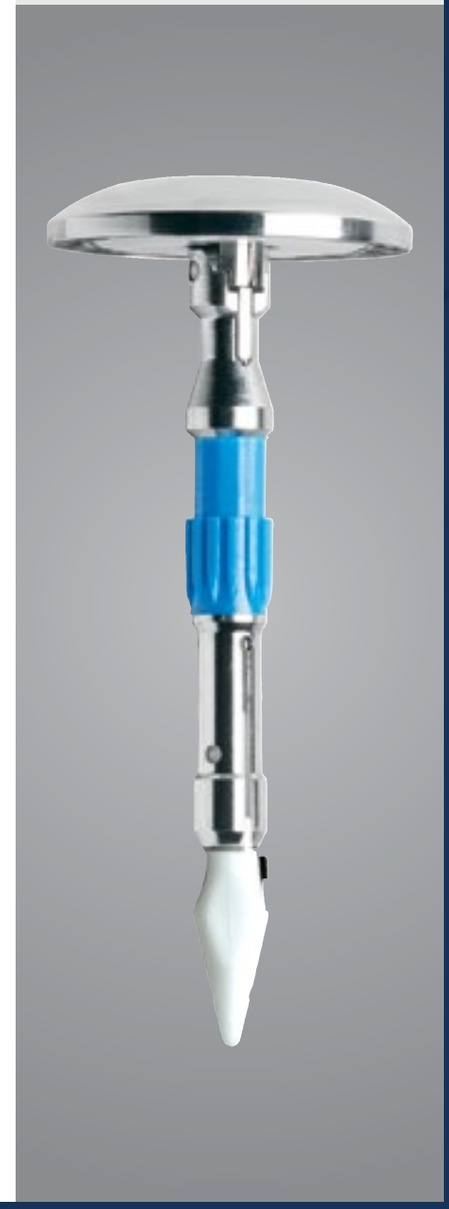
TECHNOLOGY

The EEA™ stapler with DST Series™ technology provides:

- Confidence that comes from more than three decades of clinical experience in colorectal surgery
- Proprietary DST that improves staple formation due to its proprietary rectangular wire cross-section that ensures precise staple formation in challenging applications compared to traditional round wire cross-section[1]
- Versatile platform to include two lengths (standard and XL) the most important sizes in colon and rectum

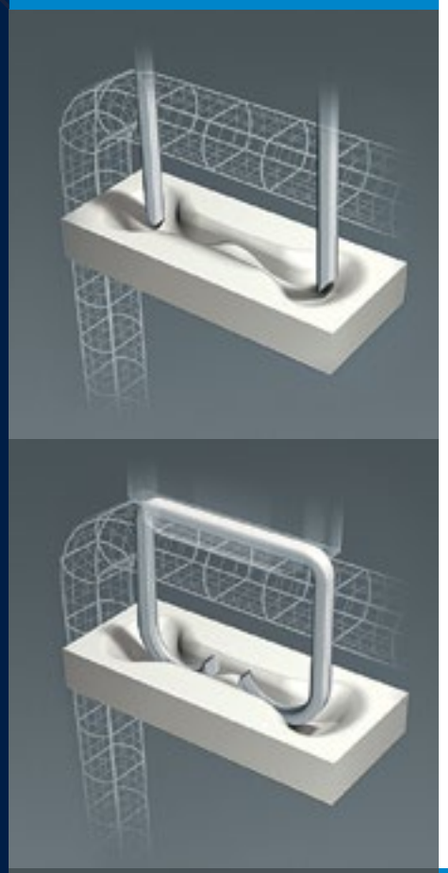


REFERENCES

PERFORMANCE

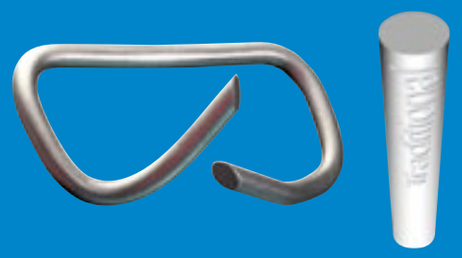
CHALLENGE	SOLUTION
Anastomotic leaks can lead to devastating outcomes. Confidence in proven performance and quality is imperative in this critical firing.	The EEA™ stapler with DST Series™ technology provides reliability, consistency and efficiency from three decades of experience and input from colorectal surgeons around the world.[1]
Poor staple formation is a risk in dense and variable tissues, especially in the colon and rectum following radiation therapy.	The EEA™ stapler with DST Series™ technology incorporates DST with rectangular wire cross-section that bends more reliably in the intended direction to improve staple formation in challenging applications compared to traditional round wire cross-section.[1,†]
Access to the anastomotic site can be difficult — especially in more proximal rectal lesions.	The EEA™ stapler with DST Series™ technology provides availability of XL length with a 17 percent longer shaft length (35 cm working length) than competitive models for improved access.[1]

†Preclinical results may not correlate with clinical performance in humans.



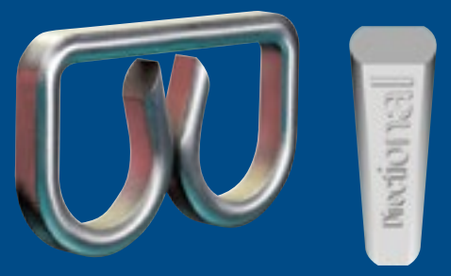
SPECIFICATIONS

Stapler	Product description	Color	Staple size
EEA21	EEA™ stapler with DST Series™ technology 21 mm stapler	Aqua	4.8
EEAXL21	EEA™ stapler with DST Series™ technology XL 21 mm stapler	Aqua	4.8
EEA2135	EEA™ stapler with DST Series™ technology 21 mm stapler with 3.5 mm staples	Aqua	3.5
EEAXL2135	EEA™ stapler with DST Series™ technology XL 21 mm stapler with 3.5 mm staples	Aqua	3.5
EEA25	EEA™ stapler with DST Series™ technology 25 mm stapler	White	4.8
EEAXL25	EEA™ stapler with DST Series™ technology XL 25 mm stapler	White	4.8
EEA2535	EEA™ stapler with DST Series™ technology 25 mm stapler with 3.5 mm staples	White	3.5
EEAXL2535	EEA™ stapler with DST Series™ technology XL 25 mm stapler with 3.5 mm staples	White	3.5
EEA28	EEA™ stapler with DST Series™ technology 28 mm stapler	Blue	4.8
EEAXL28	EEA™ stapler with DST Series™ technology XL 28 mm stapler	Blue	4.8
EEA2835	EEA™ stapler with DST Series™ technology 28 mm stapler with 3.5 mm staples	Blue	3.5
EEAXL2835	EEA™ stapler with DST Series™ technology XL 28 mm stapler with 3.5 mm staples	Blue	3.5
EEA31	EEA™ stapler with DST Series™ technology 31 mm stapler	Green	4.8
EEAXL31	EEA™ stapler with DST Series™ technology XL 31 mm stapler	Green	4.8
EEA33	EEA™ stapler with DST Series™ technology 33 mm stapler	Yellow	4.8
EEAXL33	EEA™ stapler with DST Series™ technology XL 33 mm stapler	Yellow	1.8
EEAORVIL21	EEA™ stapler with Orvil™ device 21 mm (compatible with XL stapler only)	Aqua	N/A
EEAORVIL25	EEA™ stapler with Orvil™ device 25 mm (compatible with XL stapler only)	White	N/A



TRADITIONAL STAPLE

Round wire cross-section is more prone to bending in any direction in challenging applications.[1]



DST SERIES™ TECHNOLOGY

Rectangular wire cross-section bends more reliably in the intended direction.[1]

EEA™ Stapler with DST Series™ Technology

REFERENCE

1. Rodeheaver G, Internally sponsored study, Directional Stapling Technology (DST): improved reliability in staple formation in canine models (GIA™ Stapler with DST Series™ technology). 2006.

The EEA™ stapler with DST Series™ technology provides reliable and consistent performance backed by years of clinical experience.

Polysorb™
Braided Absorbable Sutures

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CLOSURE

Polysorb™ suture

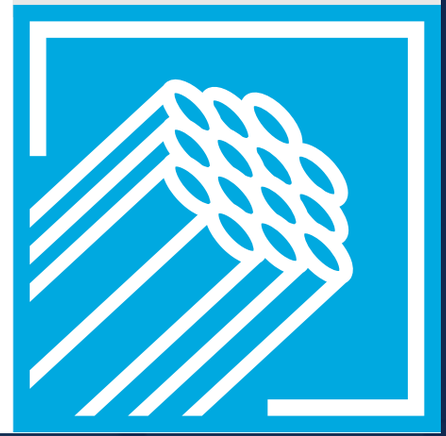
Biosyn™ suture

Maxon™ suture

V-Loc™ knotless wound closure device

TECHNOLOGY

Polysorb™ sutures are composed of Lactomer™* copolymer, which is a synthetic polyester composed of glycolide and lactide (derived from glycolic and lactic acids). They are prepared by coating the suture with a mixture of a caprolactone/glycolide copolymer and calcium stearoyl lactylate.



absorbable suture is needed.

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PERFORMANCE

CHALLENGE

Wound dehiscence, which is estimated to occur in up to 3.5 percent of patients following surgery.

SOLUTION

The advanced extrusion process of the molecule of Lactomer™* 9-1, the exclusive braiding process, and coating system, give the suture increased strength during the critical wound healing period compared to VICRYL™* sutures,[1–4] and excellent knot security.[1,5,6]

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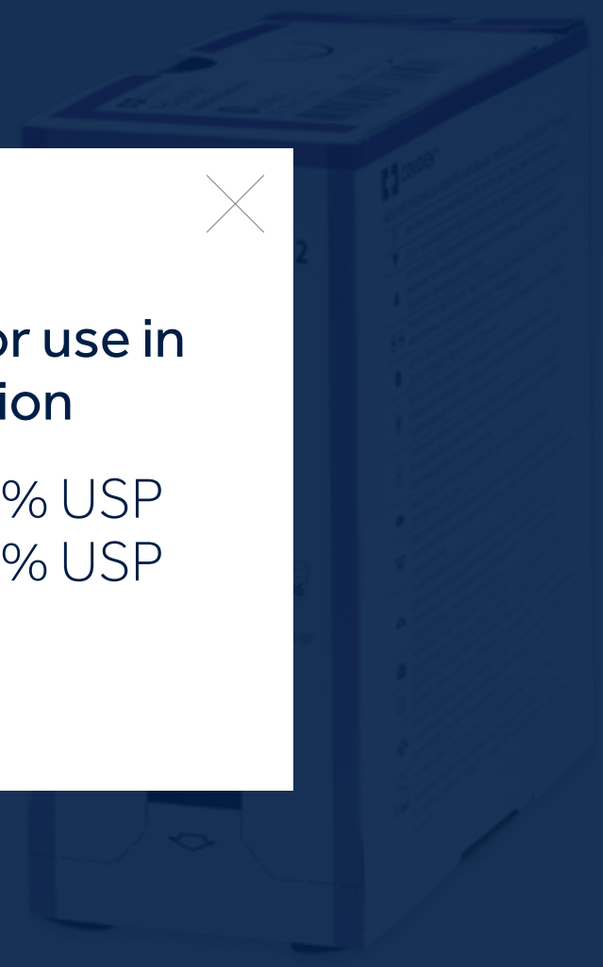
Polysorb™
Braided Absorbable Sutures

SPECIFICATIONS

Polysorb™ sutures are indicated for use in soft tissue approximation or ligation

Tensile strength:	2 weeks: 80% USP 3 weeks: 30% USP
Absorption profile:	56–70 days



suture with applications in all surgical specialities where a strong absorbable suture is needed.

Polysorb™
Braided Absorbable Sutures

REFERENCES

1. Based on internal test report #RE00081904 Polysorb benchmarking. 2013.
2. van Ramshorst GH, Nieuwenhuizen J, Hop WC, et al. Abdominal wound dehiscence in adults: development and validation of a risk model. *World J Surg.* 2010 Jan;34(1):20–27.
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5. Debus ES, Geiger D, Sailer M, Ederer J, Thiede A. Physical, biological and handling characteristics of surgical suture material: A comparison of four different multifilament absorbable sutures. *Eur Surg Res.* 1997;29:52–61.
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Biosyn™
Monofilament Absorbable Sutures

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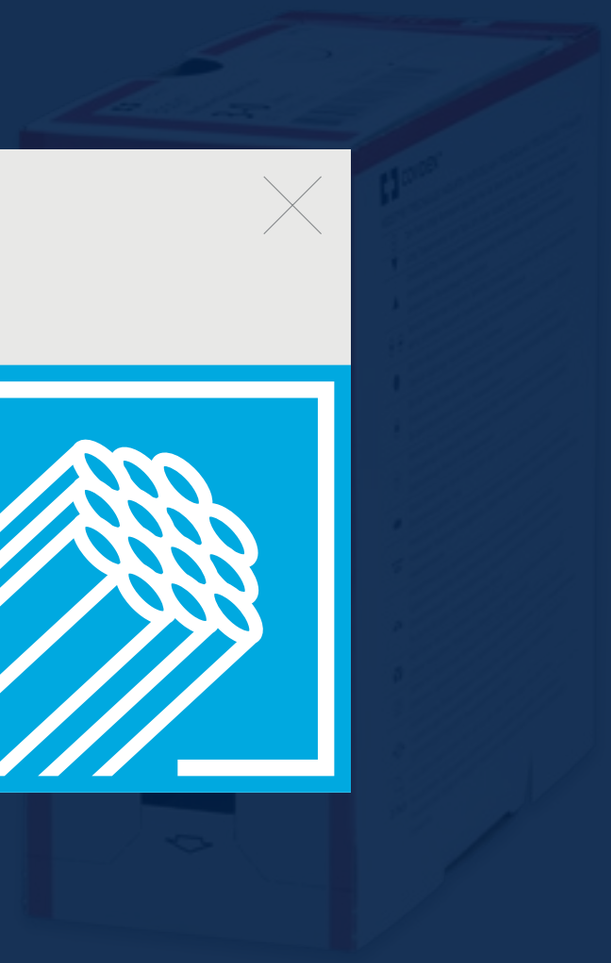

TECHNOLOGY

Biosyn™ monofilament absorbable sutures are prepared from Glycomer™* 631, a synthetic polyester composed of glycolide (60%), dioxanone (14%), and trimethylene carbonate (26%).

strength retention and absorption profiles to meet your surgical and tissue healing needs.

TECHNOLOGY | PERFORMANCE | SPECIFICATIONS

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PERFORMANCE

CHALLENGE

Maintaining tensile strength across the wound until tissue tensile strength is adequate.

SOLUTION

Biosyn™ monofilament absorbable sutures strength (average knot pull) meets USP and EP specifications.[1]

Biosyn™
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V-Loc™ knotless wound closure device

SPECIFICATIONS

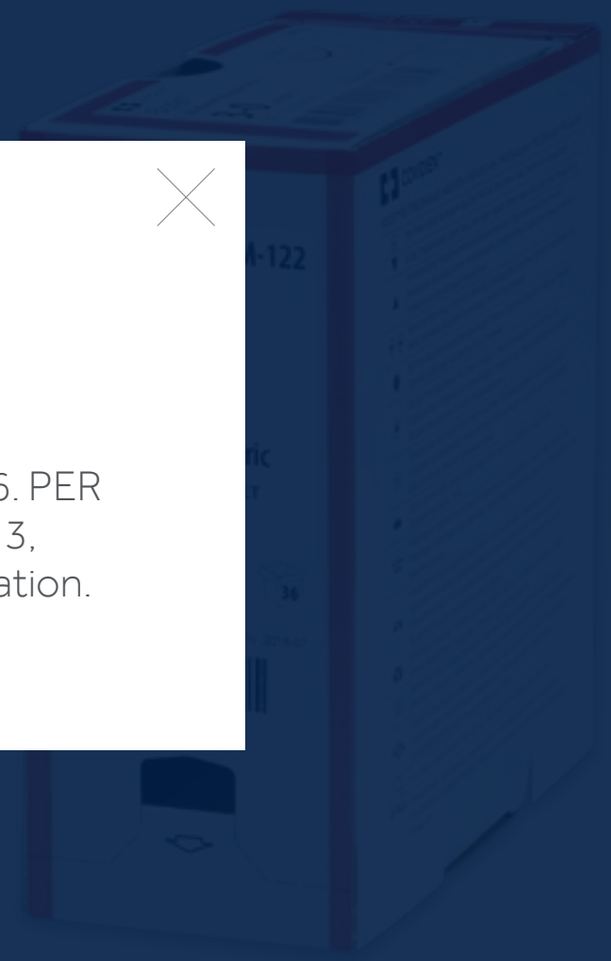
Biosyn™ sutures are indicated for use in general soft tissue approximation or ligation

Tensile strength:	2 weeks: 75% USP 3 weeks: 40% USP
Absorption profile:	90–110 days

strength retention and absorption profiles to meet your surgical and tissue healing needs.

Medtronic

Biosyn™
Monofilament Absorbable Sutures



REFERENCE

1. Based on internal report: SUT10181, SUT10182, SUT10183, SUT10184, SUT10185, SUT13059, SUT13060, and SUT13116. PER report Biosyn™ size 1 to 6-0 Bigfoot DQA qualification October 3, 2013. Clinical report Biosyn™ size 1 to 6–0 Bigfoot DQA qualification. February 14, 2014.

Biosyn™ sutures provide the strength retention and absorption profiles to meet your surgical and tissue healing needs.

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Maxon™ suture

V-Loc™ knotless wound closure device

TECHNOLOGY

Maxon™ and Maxon™ CV monofilament polyglyconate synthetic absorbable sutures (clear or green) are prepared from a copolymer of glycolic acid and trimethylene carbonate.

monofilament absorbable sutures that provide excellent strength over the critical wound healing period.

PERFORMANCE

CHALLENGE

Short-term absorbable sutures or sutures with insufficient tensile strength can cause post-operative fascial dehiscence and wound complications.

SOLUTION

Maxon™ long-term absorbable sutures tensile strength (average knot pull) meets USP and EP specifications.[1]

Maxon™
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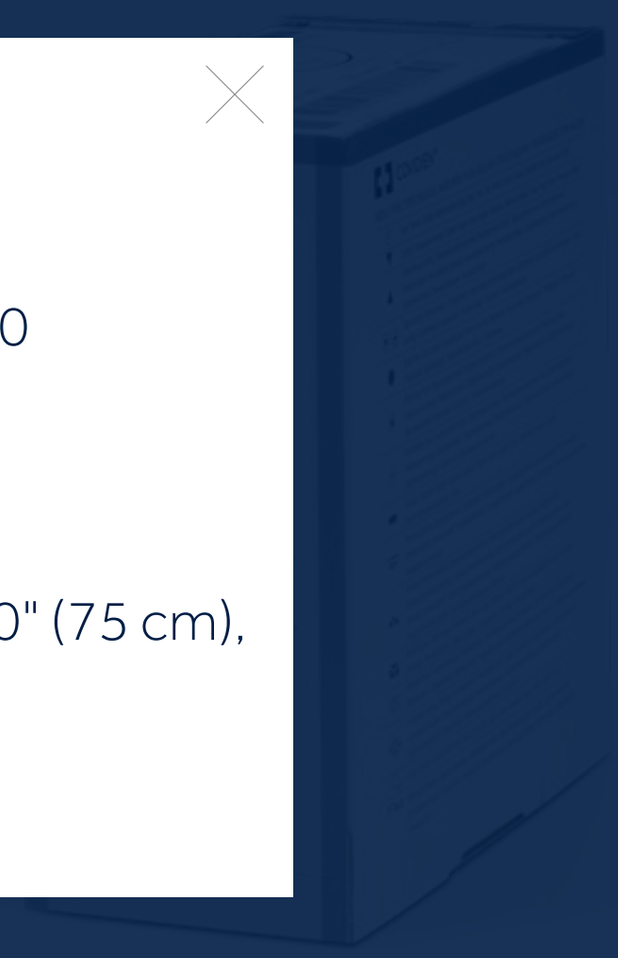
SPECIFICATIONS

Color:	Green, clear
HPIS code:	755_50_10_10
Latex free:	No
Product style:	Absorbable
Suture length:	24" (60 cm), 30" (75 cm), 36" (90 cm)
UNSPSC:	42312201



the critical wound healing period.

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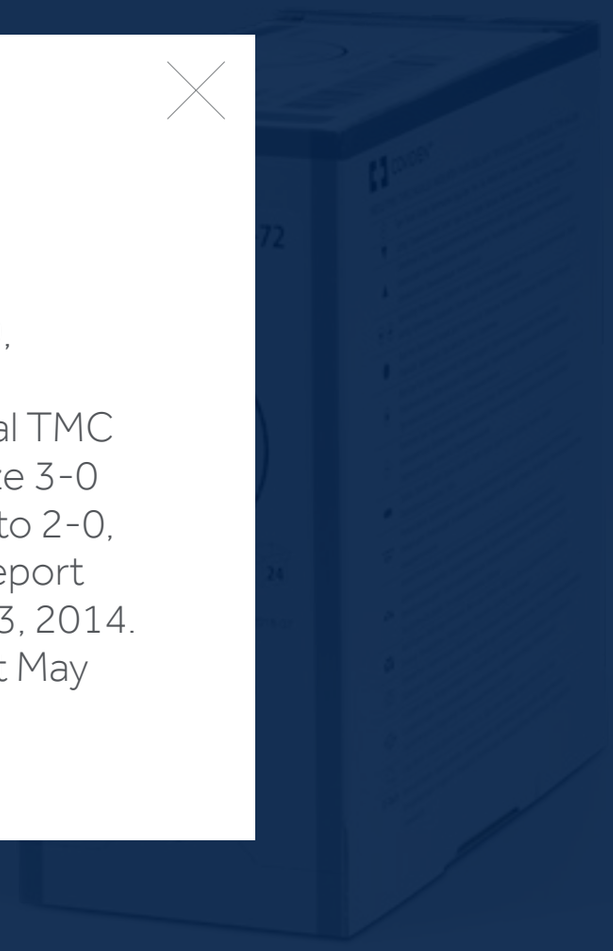
V-Loc™ knotless wound closure device

REFERENCE

1. Based on Internal Report Number: RE00007428, RE00007429, SUT09014, SUT09017, SUT09018, SUT100001, SUT10092, SUT10094, SUT13134, SUT13142 & SUT13143. PER & Clinical TMC Supplier change BI to SA DQA Qualification Report Maxon™ Size 3-0 to 7-0 March 30, 2016. PER and Clinical Report Maxon™ Size 1 to 2-0, 3-0 to 6-0 DQA Qualification Report January 28, 2009. PER Report Maxon™ Size 1 to 6-0 DQA Bigfoot Qualification Report April 23, 2014. PER Report Maxon™ D-Tach Size 5-0 DQA Qualification Report May 09, 2014.



that provide excellent strength over the critical wound healing period.

TECHNOLOGY

PERFORMANCE

SPECIFICATIONS

REFERENCES

Medtronic

V-Loc™
Knotless Wound
Closure Device

INTRODUCTION

PRODUCTS

MIS STEPS

OPEN STEPS

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DISSECTION

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STRUCTURE

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CLOSURE

Polysorb™ suture

Biosyn™ suture

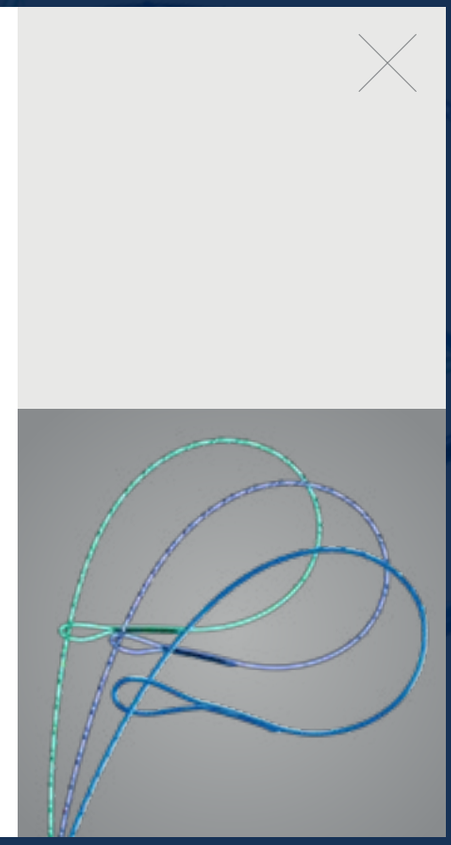
Maxon™ suture

V-Loc™ knotless wound closure device

TECHNOLOGY

The V-Loc™ device uses a dual-angle cut that creates an anchoring bar while optimizing the strand's integrity.

The V-Loc™ device has a unidirectional barb design that distributes tension across the wound. Meanwhile, circumferential barbs anchor tissue at numerous points, eliminating the need for knots.



closure for patients.

TECHNOLOGY PERFORMANCE SPECIFICATIONS

Medtronic

V-Loc™
Knotless Wound
Closure Device

INTRODUCTION

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V-Loc™ knotless
wound closure device

PERFORMANCE

CHALLENGE

Conventional sutures depend on knot integrity for security, and they can potentially cause knot-related complications.

SOLUTION

V-Loc™ knotless wound closure device means no need for knots. There's less risk for the ischemic tissue that can result from tying knots too tight.

closure for patients.

TECHNOLOGY

PERFORMANCE

SPECIFICATIONS

Medtronic

SPECIFICATIONS

	V-Loc™ 90 absorbable device	V-Loc™ 180 absorbable device	V-Loc™ PBT nonabsorbable device
Tensile strength	7 days, 90%; 14 days, 75%	7 days, 80%; 14 days, 75%; 21 days, 65%	Permanent
Absorption profile	90–110 days	180 days	Permanent
Procedural applications	Soft tissue approximation where support is required consistent with the absorption profile	Soft tissue approximation where support is required consistent with the absorption profile	Soft tissue approximation
Color	Undyed, violet	Clear, green	Blue
			
Composition	Glycolide, dioxanone, and trimethylene carbonate	Copolymer of glycolic acid and trimethylene carbonate	Polybutester
Indications	V-Loc™ 90 device and V-Loc™ 180 absorbable wound closure devices are indicated for soft tissue approximation where use of an absorbable suture is appropriate	V-Loc™ 90 device and V-Loc™ 180 absorbable wound closure devices are indicated for soft tissue approximation where use of an absorbable suture is appropriate	V-Loc™ PBT nonabsorbable wound closure devices are indicated for soft tissue approximation