



Ethicon Edge

Competitive Performance Testing

Wound Closure
2018



Table of Contents

Needles

BV-1	XX
BV130-5	3-5
BV175-6	6-9
BV175-8	10
C-1	11-12
CC	XX
CC-1	XX
CT	13-14
CT-1	15-16
FS-2	XX
P-3 PRIME	XX
PC-1	XX
PS-1 PRIME	XX
PS-2 PRIME	XX
RB-1	17
SH	18-19
SH-1	XX
V-5	XX
V-7	20
V-34	20
STRATAFIX™ Knotless Tissue Control Device Needles	21-24

Needle Glossary	25
------------------------	----

Sutures

ETHIBOND EXCEL® Polyester Suture	26-29
MONOCRYL® (poliglecaprone 25) Suture	30-31
PDS® (polydioxanone) Suture	XX
PROLENE® Polypropylene Suture	32-40
Coated VICRYL® (polyglactin 910) Suture and Coated VICRYL® Plus Antibacterial (polyglactin 910) Suture	41-55
VICRYL RAPIDE™ (polyglactin 910) Suture	XX
STRATAFIX™ Symmetric PDS™ Plus Knotless Tissue Control Device	56
STRATAFIX™ Spiral PDS™ Plus Knotless Tissue Control Device	57-58
STRATAFIX™ Spiral MONOCRYL™ Plus Knotless Tissue Control Device	58

Regional Sutures

ETHIBOND EXCEL Suture (Asia-Pacific)	59
--------------------------------------	----

Suture Glossary	60
------------------------	----

Topical Skin Adhesives

DERMABOND ADVANCED® Topical Skin Adhesive	61
DERMABOND® PRINEO® Skin Closure System (22 cm)	62

Advanced Suturing Systems

PROXISURE™ Suturing Device	63
----------------------------	----

Vascular Access Device Protection

BIOPATCH® Protective Disk with CHG	64-67
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Ethicon Surgical Needles

Competitive Performance Testing

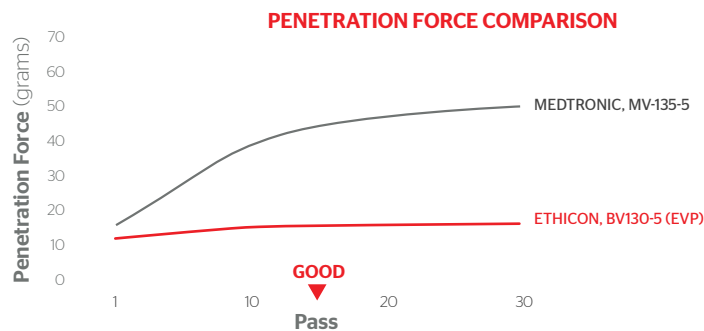
Ethicon Needle Alloy	Code	Competitor	Code
EVERPOINT (EVP)	BV130-5	Medtronic	MV-135-5



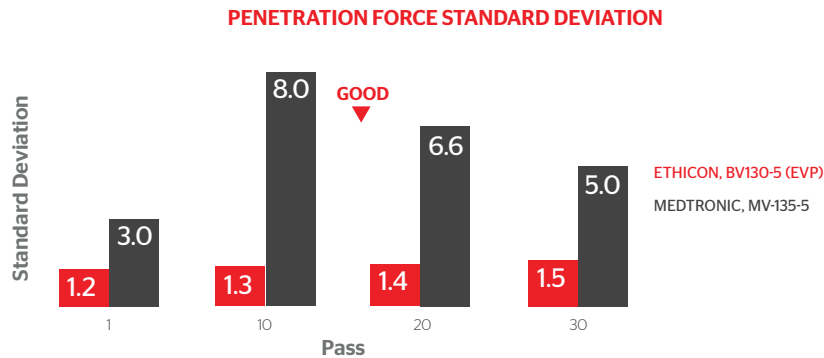
- ✓ Less penetration force required
- ✓ Less variability in penetration force
- ✓ Greater strength regardless of angle*

Testing Outcomes

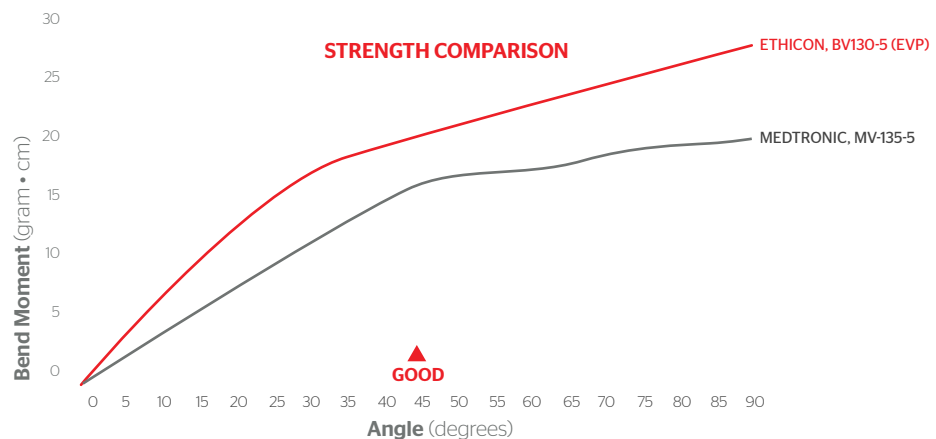
- BV130-5 EVERPOINT (EVP) required less penetration force than MV-135-5 from 1 to 30 passes



- BV130-5 EVERPOINT (EVP) showed less variability in penetration force than MV-135-5 from 1 to 30 passes



- BV130-5 EVERPOINT (EVP) displayed greater strength than MV-135-5 regardless of the angle at which force was applied



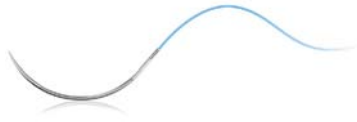
*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT17-001. BV130-5 Competitive Assessment. February 10, 2017. Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

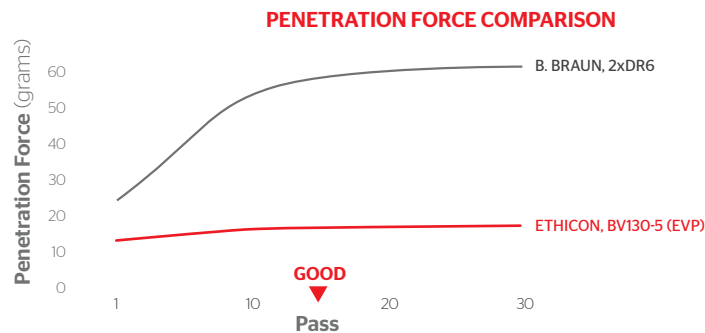
Ethicon Needle Alloy	Code	Competitor	Code
EVERPOINT (EVP)	BV130-5	B. Braun	2xDR6



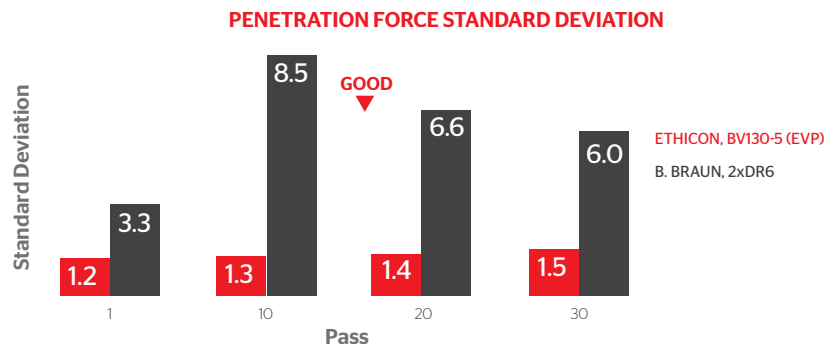
- ✓ Less penetration force required
- ✓ Less variability in penetration force
- ✓ Greater or statistically equivalent strength*

Testing Outcomes

- BV130-5 EVERPOINT (EVP) required less penetration force than 2xDR6 from 1 to 30 passes



- BV130-5 EVERPOINT (EVP) showed less variability in penetration force than 2xDR6 from 1 to 30 passes



- BV130-5 EVERPOINT (EVP) displayed greater (0-40°) or statistically equivalent (45-90°) strength compared to 2xDR6



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT17-001. BV130-5 Competitive Assessment. February 10, 2017. Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

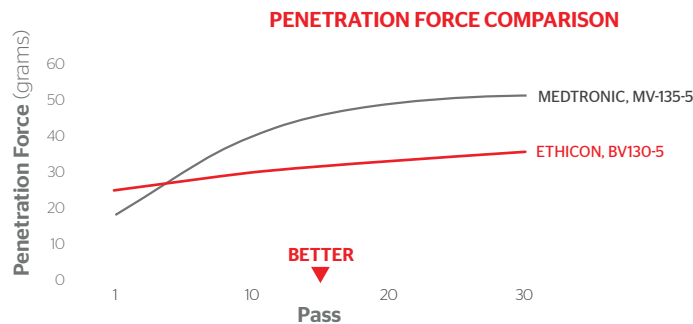
Ethicon Needle Alloy	Code	Competitor	Code
ETHALLOY	BV130-5	Medtronic	MV-135-5



✓ Less penetration force required

Testing Outcomes

- BV130-5 required less penetration force than MV-135-5 from 1 to 30 passes



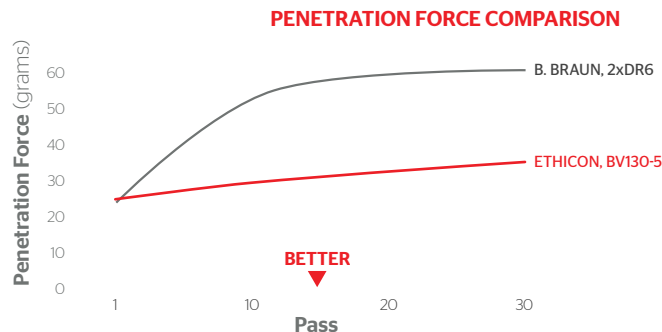
Ethicon Needle Alloy	Code	Competitor	Code
ETHALLOY	BV130-5	B. Braun	2xDR6



✓ Less penetration force required

Testing Outcomes

- BV130-5 required less penetration force than 2xDR6 from 1 to 30 passes





Ethicon Surgical Needles

Competitive Performance Testing

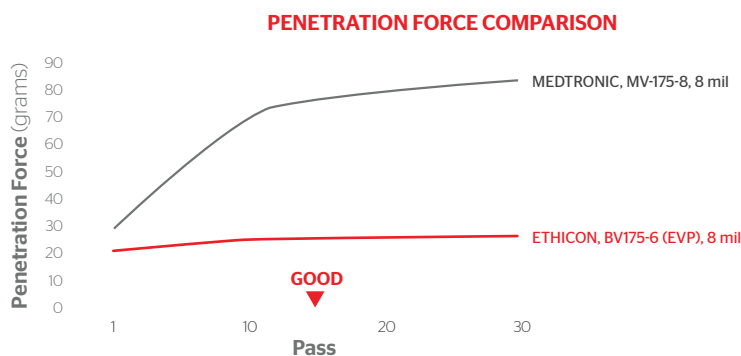
Ethicon Needle Alloy	Code	Competitor	Code
EVERPOINT (EVP)	BV175-6	Medtronic	MV-175-8



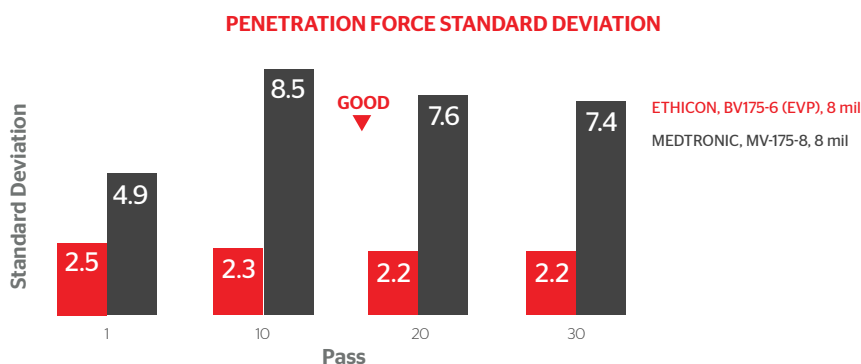
- ✓ Less penetration force required
- ✓ Less variability in penetration force
- ✓ Greater strength regardless of angle*

Testing Outcomes

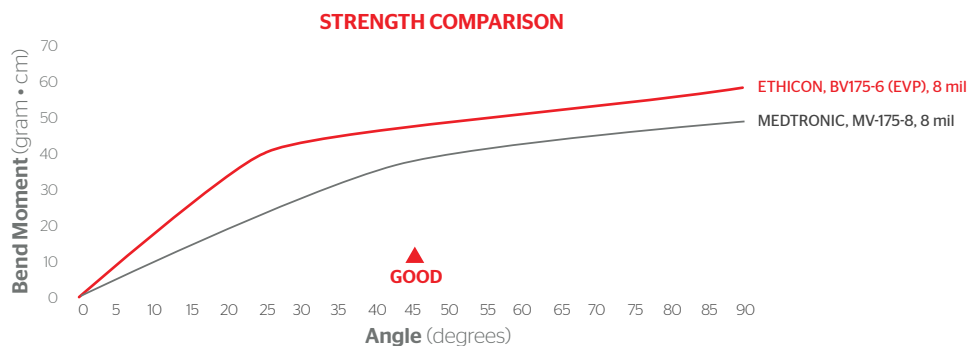
- BV175-6 EVERPOINT (EVP) required less penetration force than MV-175-8 from 1 to 30 passes



- BV175-6 EVERPOINT (EVP) showed less variability in penetration force than MV-175-8 from 1 to 30 passes



- BV175-6 EVERPOINT (EVP) displayed greater strength than MV-175-8 regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT16-001, BV175-6 Competitive Assessment, July 19, 2016, Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

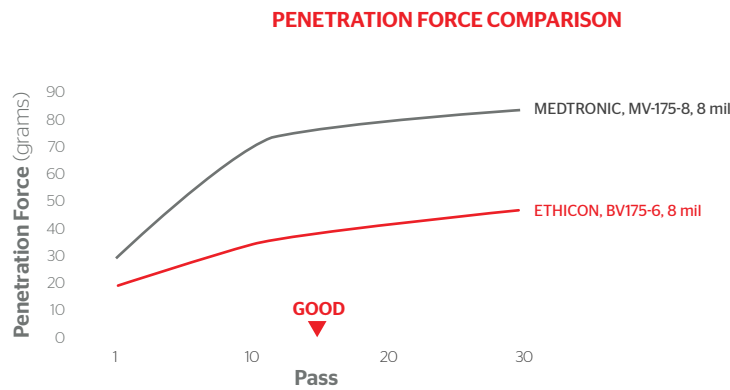
Ethicon Needle Alloy	Code	Competitor	Code
ETHALLOY	BV175-6	Medtronic	MV175-8



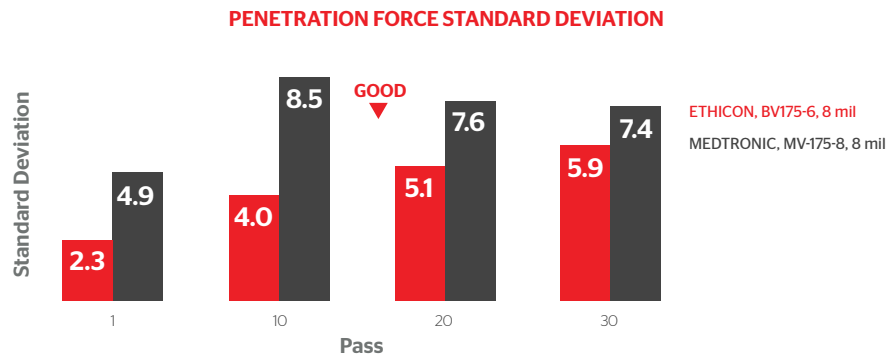
- ✓ Less penetration force required
- ✓ Less variability in penetration force

Testing Outcomes

- BV175-6 required less penetration force than MV175-8 from 1 to 30 passes



- BV175-6 showed less variability in penetration force than MV175-8 from 1 to 30 passes





Ethicon Surgical Needles

Competitive Performance Testing

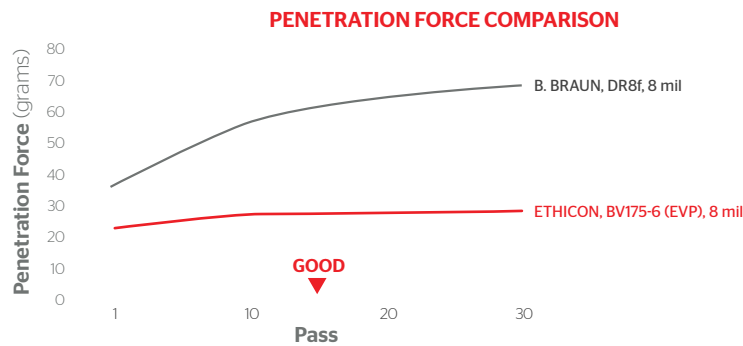
Ethicon Needle Alloy	Code	Competitor	Code
EVERPOINT (EVP)	BV175-6	B. Braun	DR8f



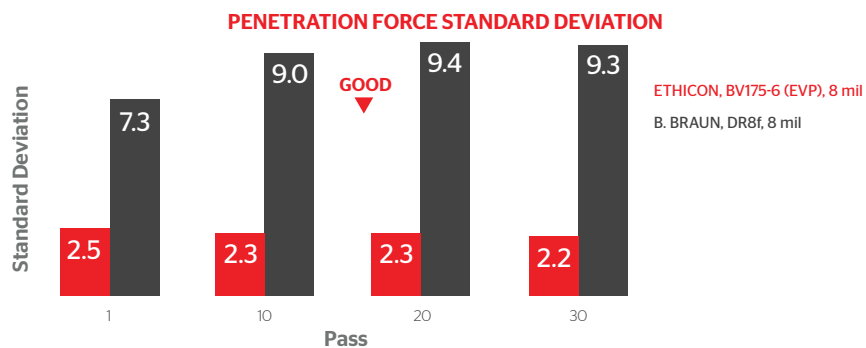
- ✓ Less penetration force required
- ✓ Less variability in penetration force
- ✓ Greater strength regardless of angle*

Testing Outcomes

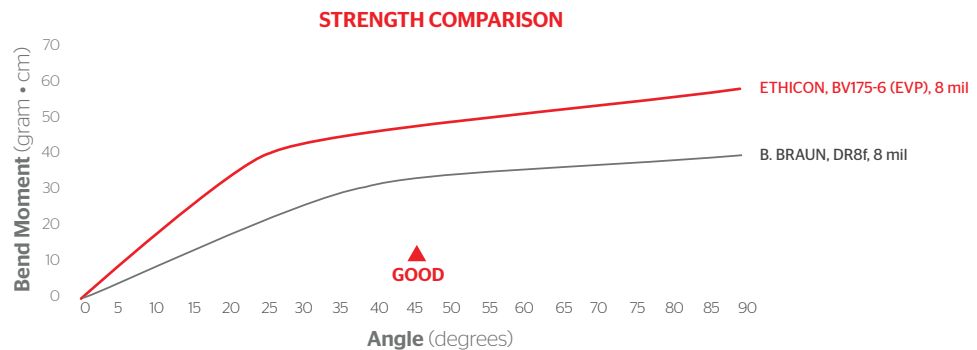
- BV175-6 EVERPOINT (EVP) required less penetration force than DR8f from 1 to 30 passes



- BV175-6 EVERPOINT (EVP) showed less variability in penetration force than DR8f from 1 to 30 passes



- BV175-6 EVERPOINT (EVP) displayed greater strength than DR8f regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT16-004. BV175-6 Competitive Assessment. August 23, 2016. Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

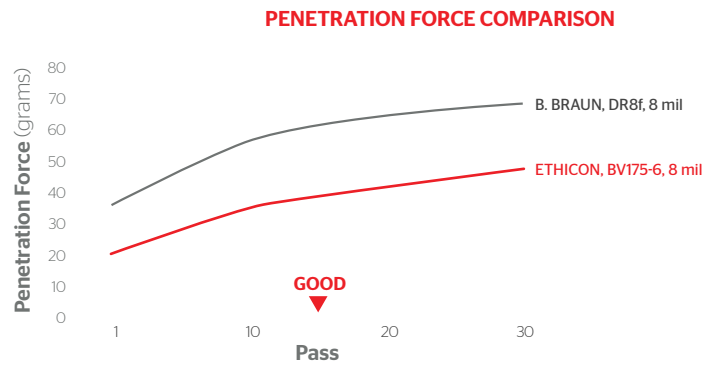
Ethicon Needle Alloy	Code	Competitor	Code
ETHALLOY	BV175-6	B. Braun	DR8f



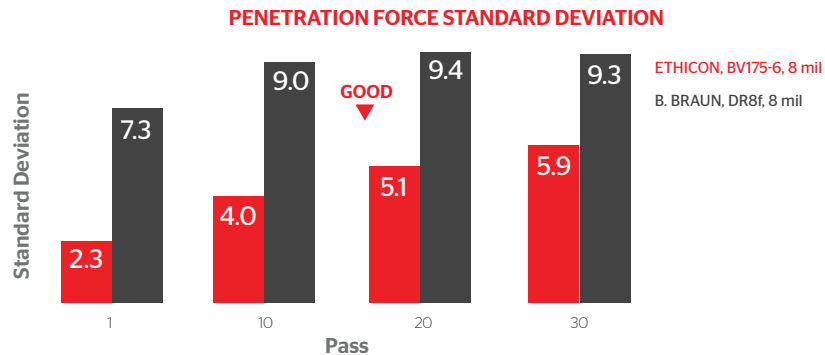
- ✓ Less penetration force required
- ✓ Less variability in penetration force

Testing Outcomes

- BV175-6 required less penetration force than DR8f from 1 to 30 passes



- BV175-6 showed less variability in penetration force than DR8f from 1 to 30 passes





Ethicon Surgical Needles

Competitive Performance Testing

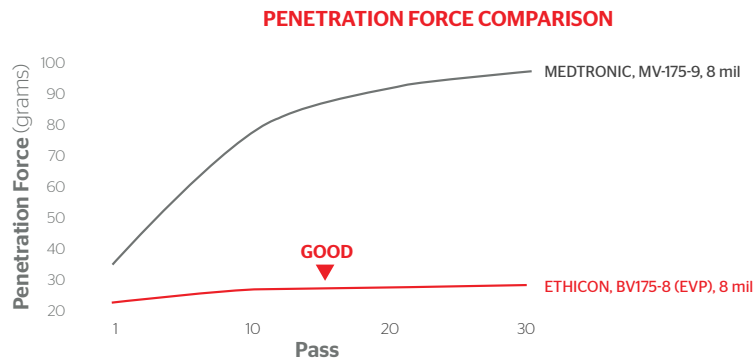
Ethicon Needle Alloy	Code	Competitor	Code
EVERPOINT (EVP)	BV175-8	Medtronic	MV-175-9



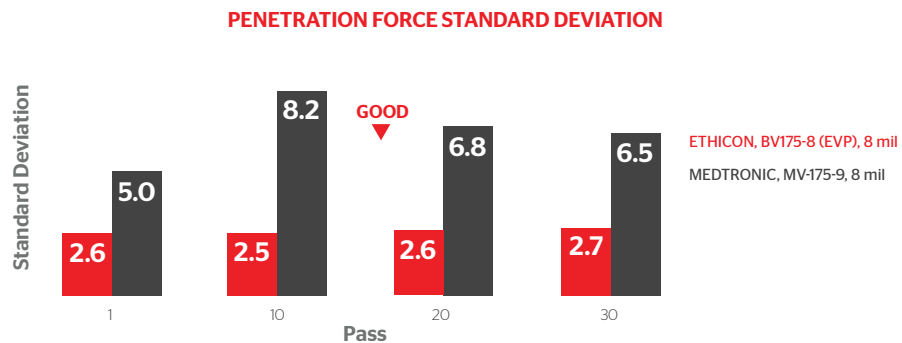
- ✓ Less penetration force required
- ✓ Less variability in penetration force
- ✓ Greater strength regardless of angle*

Testing Outcomes

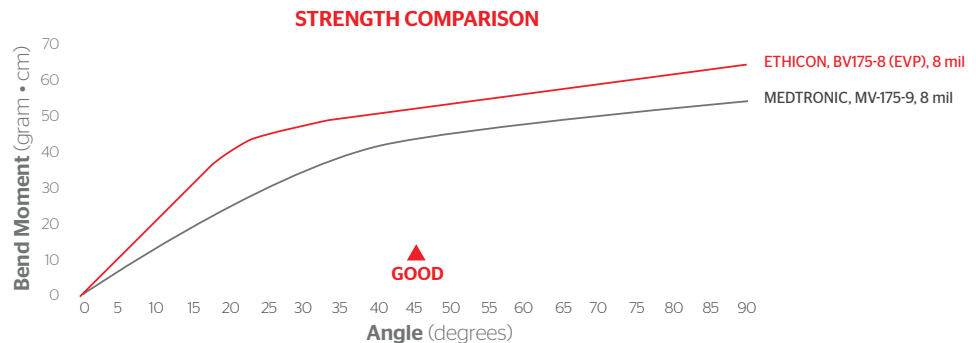
- BV175-8 EVERPOINT (EVP) required less penetration force than MV-175-9 from 1 to 30 passes



- BV175-8 EVERPOINT (EVP) showed less variability in penetration force than MV-175-9 from 1 to 30 passes



- BV175-8 EVERPOINT (EVP) displayed greater strength than MV-175-9 regardless of the angle at which force was applied



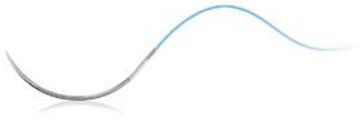
*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT16-002, BV175-8 Competitive Assessment, July 19, 2016, Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

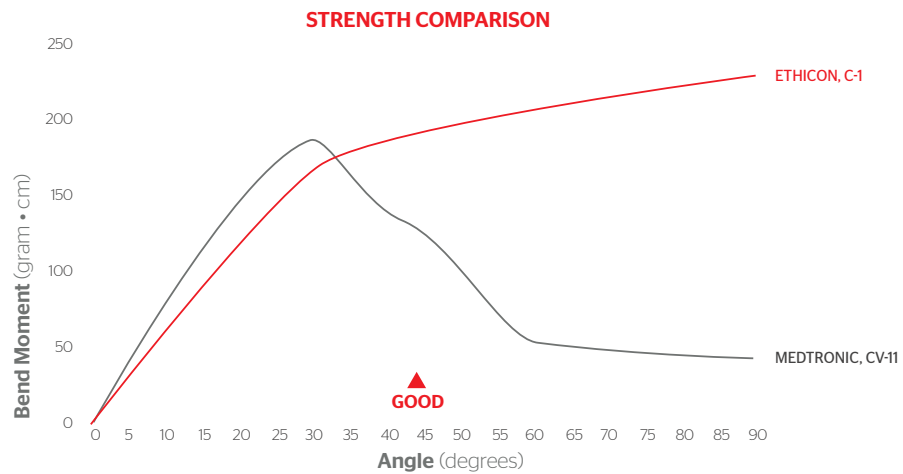
Ethicon Needle Alloy	Code	Competitor	Code
ETHALLOY	C-1	Medtronic	CV-11



✓ Greater or statistically equivalent strength*

Testing Outcomes

- C-1 displayed greater (35-90°) or statistically equivalent (0-30°) strength compared to CV-11



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT17-006, C-1 Competitive Assessment, May 20, 2017, Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

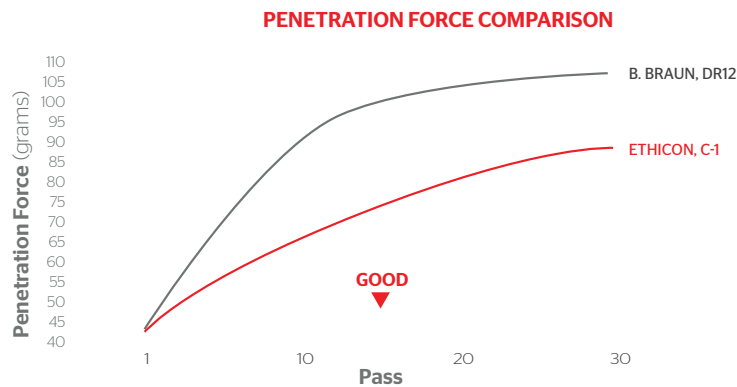
Ethicon Needle Alloy	Code	Competitor	Code
ETHALLOY	C-1	B. Braun	DR12



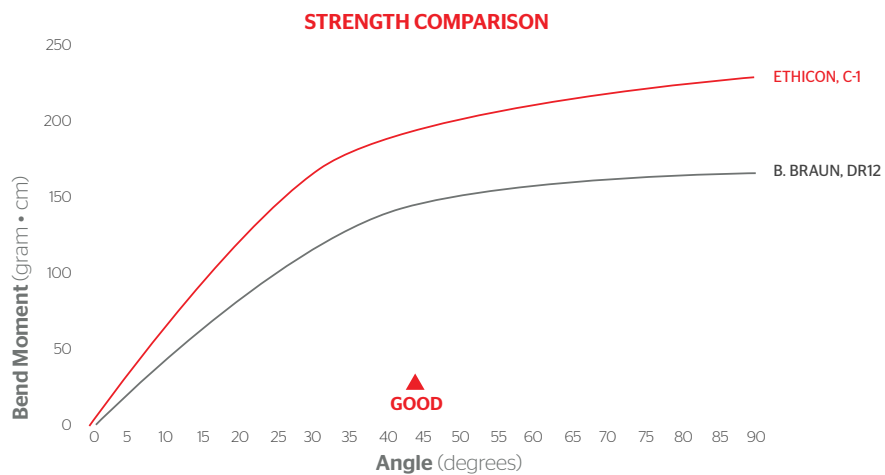
- ✓ Less penetration force required
- ✓ Greater strength regardless of angle*

Testing Outcomes

- C-1 required less penetration force than DR12 from 1 to 30 passes



- C-1 displayed greater strength than DR12 regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT17-006, C-1 Competitive Assessment, May 20, 2017, Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

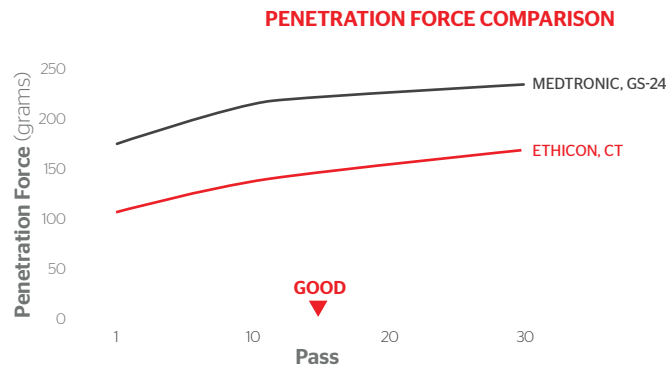
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	CT	Medtronic	GS-24



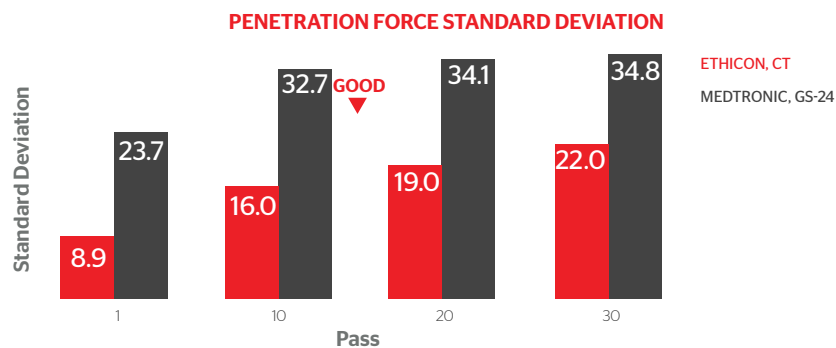
- ✓ Less penetration force required
- ✓ Less variability in penetration force
- ✓ Greater strength regardless of angle*

Testing Outcomes

- CT required less penetration force than GS-24 from 1 to 30 passes



- CT showed less variability in penetration force than GS-24 from 1 to 30 passes



- CT displayed greater strength than GS-24 regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT16-005. CT Competitive Assessment. October 17, 2016. Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

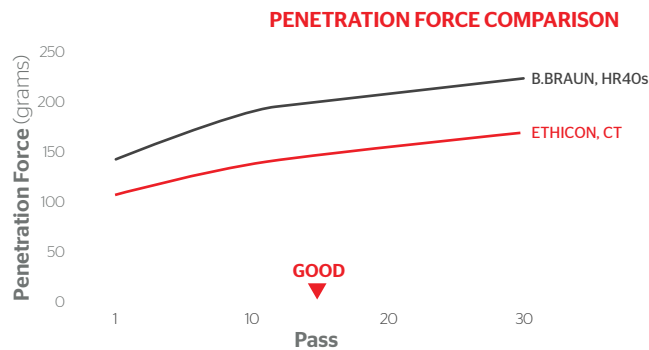
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	CT	B. Braun	HR40s



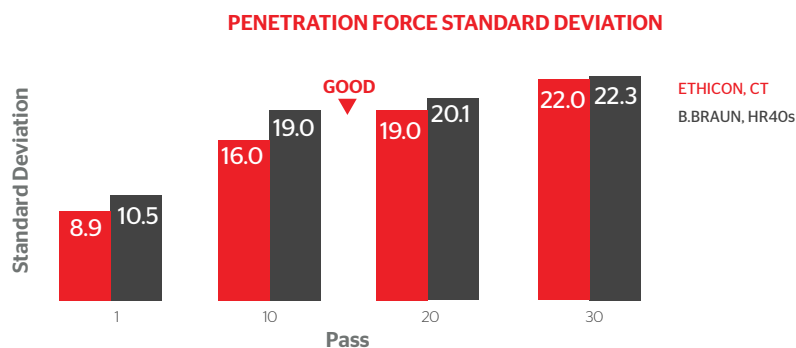
- ✓ Less penetration force required
- ✓ Less variability in penetration force
- ✓ Greater strength regardless of angle*

Testing Outcomes

- CT required less penetration force than HR40s from 1 to 30 passes



- CT showed less variability in penetration force than HR40s from 1 to 30 passes



- CT displayed greater strength than HR40s regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT16-005. CT Competitive Assessment. October 17, 2016. Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

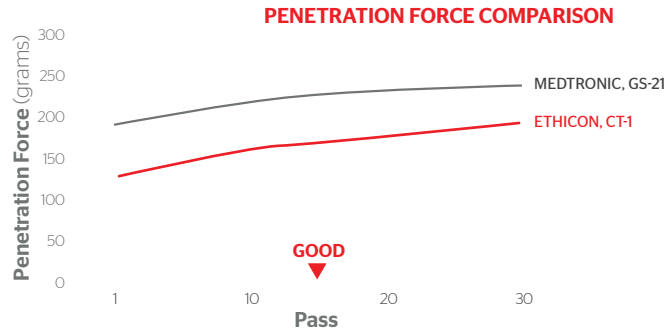
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	CT-1	Medtronic	GS-21



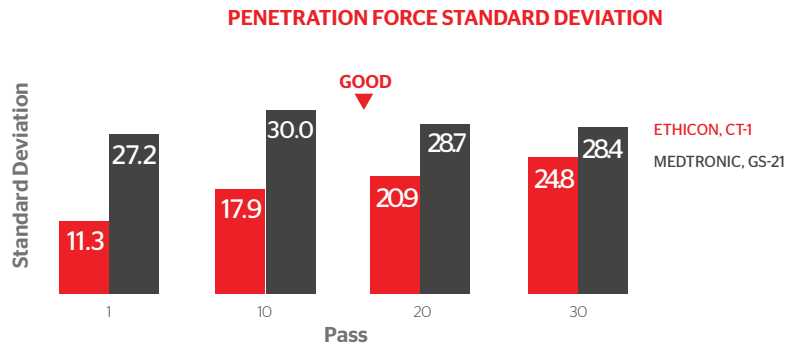
- ✓ Less penetration force required
- ✓ Less variability in penetration force
- ✓ Greater strength regardless of angle*

Testing Outcomes

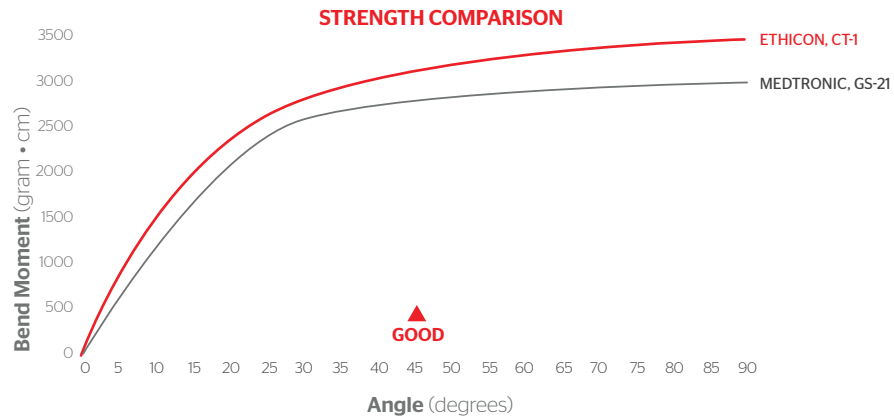
- CT-1 required less penetration force than GS-21 from 1 to 30 passes



- CT-1 showed less variability in penetration force than GS-21 from 1 to 30 passes



- CT-1 displayed greater strength than GS-21 regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT16-006. CT-1 Competitive Assessment. December 13, 2016. Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

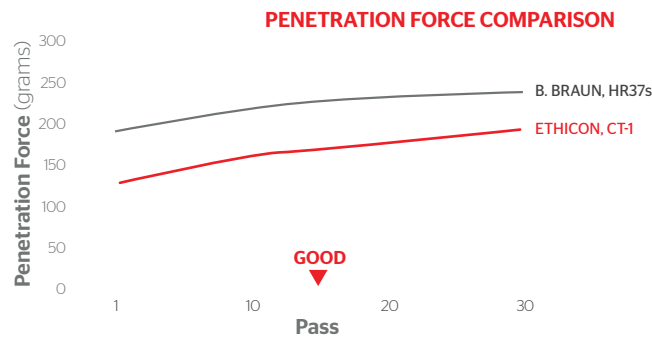
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	CT-1	B. Braun	HR37s



✓ Less penetration force required

Testing Outcomes

- CT-1 required less penetration force than HR37s from 1 to 30 passes





Ethicon Surgical Needles

Competitive Performance Testing

Ethicon Needle Alloy	Code	Competitor	Code
ETHALLOY	RB-1	Medtronic	CV-23



✓ Greater strength regardless of angle*

Testing Outcomes

- RB-1 displayed greater strength than CV-23 regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.

Reference: Technical Memo CT17-005. RB-1 Competitive Assessment. April 20, 2017. Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

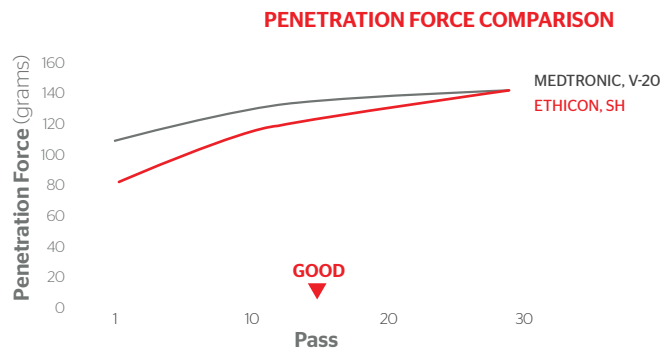
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	SH	Medtronic	V-20



- ✓ Less penetration force required
- ✓ Greater strength regardless of angle*

Testing Outcomes

- SH required less penetration force than V-20 from 1 to 30 passes



- SH displayed greater strength than V-20 regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT17-003. SH Needle Competitive Assessment. March 20, 2017. Ethicon, Inc.



Ethicon Surgical Needles

Competitive Performance Testing

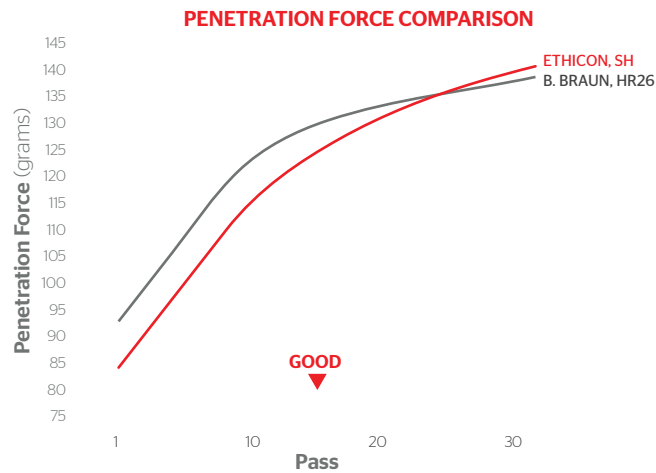
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	SH	B. Braun	HR26



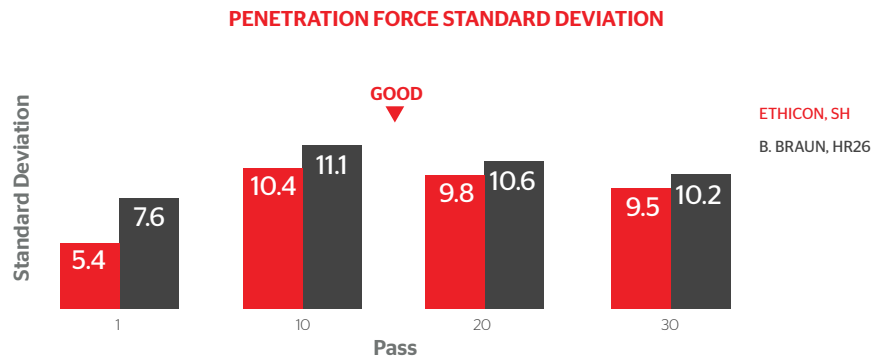
- ✓ Less penetration force required
- ✓ Less variability in penetration force

Testing Outcomes

- SH required less penetration force than HR26 from 1 to 10 passes



- SH showed less variability in penetration force than HR26 from 1 to 30 passes



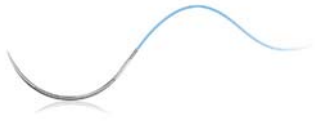


Ethicon Surgical Needles

Competitive Performance Testing

Ethicon Needle Alloy	Code
Stainless Steel	V-7

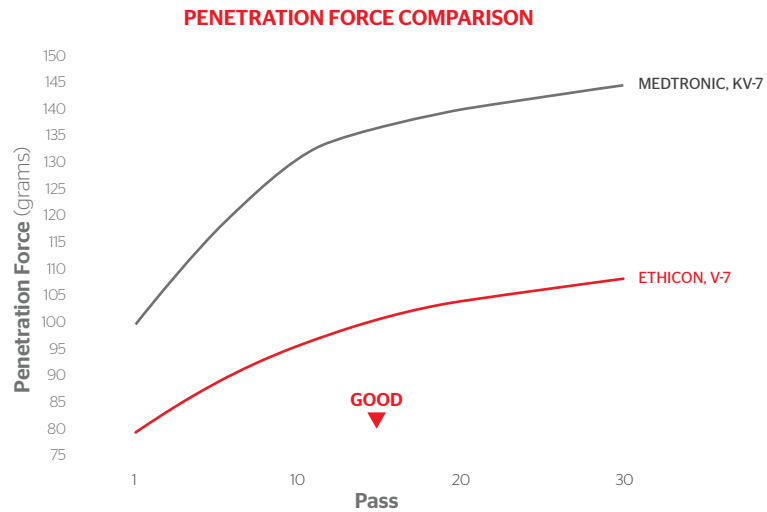
Competitor	Code
Medtronic	KV-7



✓ Less penetration force required

Testing Outcomes

- V-7 required less penetration force than KV-7 from 1 to 30 passes



Reference: Technical Memo CT18-001. V-7 Competitive Assessment. February 15, 2018. Ethicon, Inc.

Ethicon Needle Alloy	Code
Stainless Steel	V-34

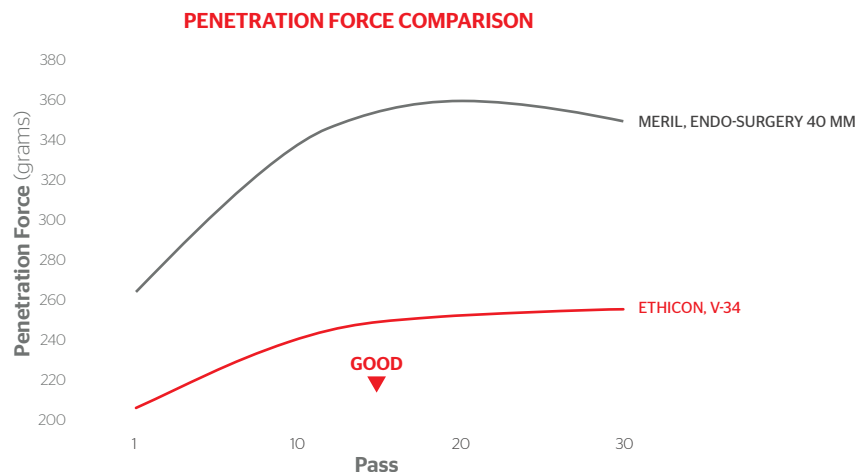
Competitor	Code
Meril	Endo-Surgery 40 mm



✓ Less penetration force required

Testing Outcomes

- V-34 required less penetration force than Meril Endo-Surgery 40 mm from 1 to 30 passes



Reference: Technical Memo CT18-003. V-34 Competitive Assessment. April 3, 2018. Ethicon, Inc.



Ethicon Surgical Needles | STRATAFIX

Competitive Performance Testing

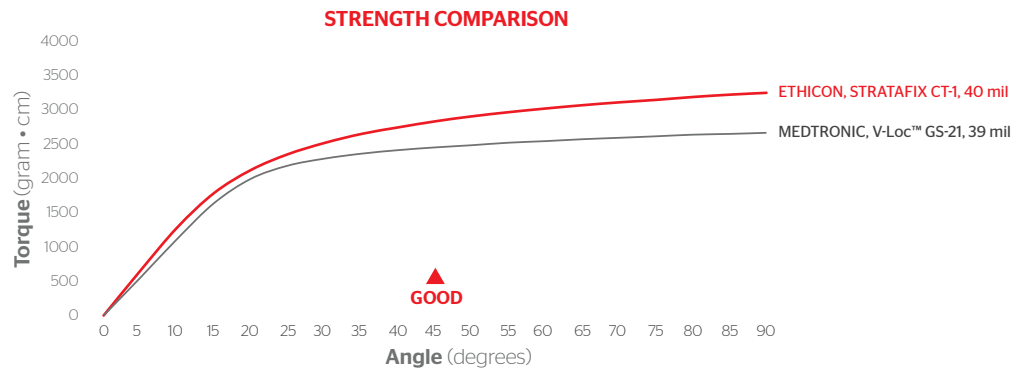
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	CT-1	Medtronic	V-Loc™ GS-21



✓ Greater strength regardless of angle*

Testing Outcomes

- STRATAFIX CT-1 displayed greater strength than V-Loc™ GS-21 regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CT12-009. December 12, 2012. Ethicon, Inc.



Ethicon Surgical Needles | STRATAFIX

Competitive Performance Testing

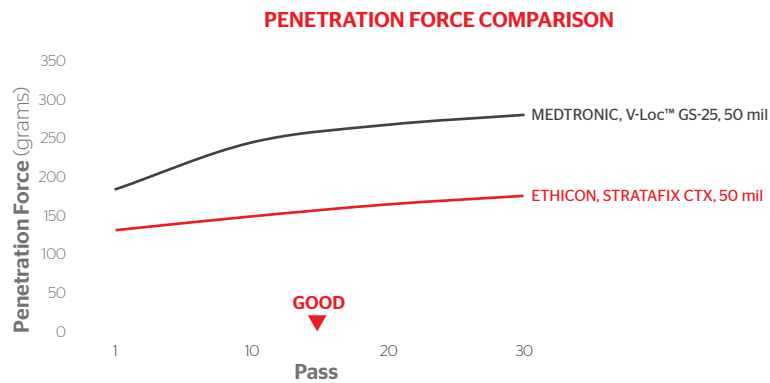
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	CTX	Medtronic	V-Loc™ GS-25



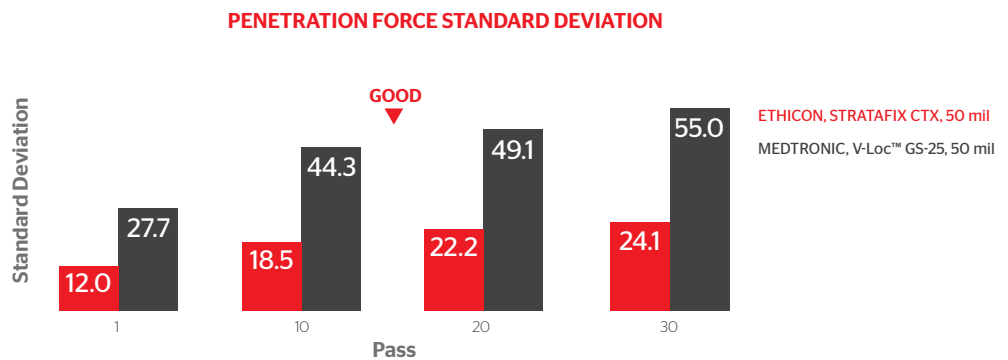
- ✓ Less penetration force required
- ✓ Less variability in penetration force

Testing Outcomes

- STRATAFIX CTX required less penetration force than V-Loc™ GS-25 from 1 to 30 passes



- STRATAFIX CTX showed less variability in penetration force than V-Loc™ GS-25 from 1 to 30 passes





Ethicon Surgical Needles | STRATAFIX

Competitive Performance Testing

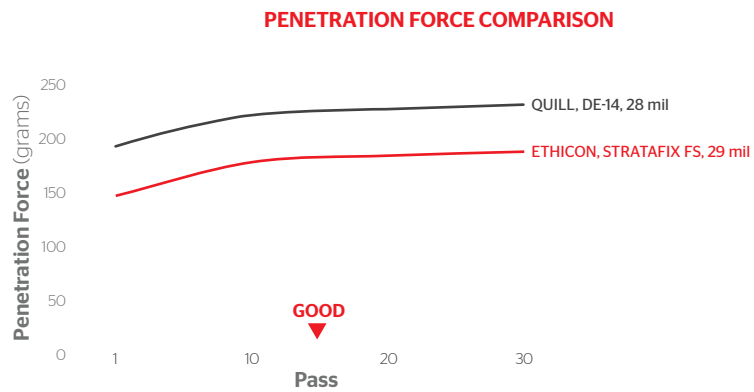
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	FS	Quill	DE-14



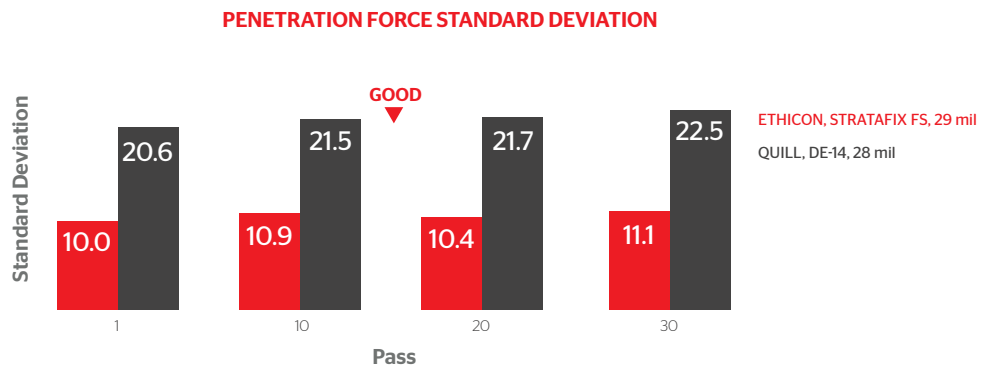
- ✓ Less penetration force required
- ✓ Less variability in penetration force

Testing Outcomes

- STRATAFIX FS required less penetration force than Quill DE-14 from 1 to 30 passes



- STRATAFIX FS showed less variability in penetration force than Quill DE-14 from 1 to 30 passes





Ethicon Surgical Needles | STRATAFIX

Competitive Performance Testing

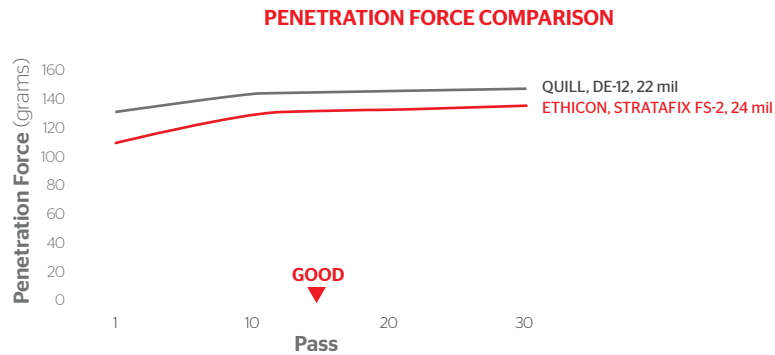
Ethicon Needle Alloy	Code	Competitor	Code
Stainless Steel	FS-2	Quill	DE-12



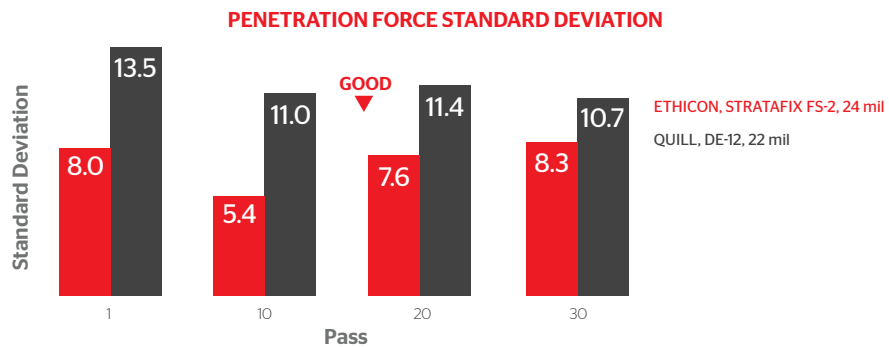
- ✓ Less penetration force required
- ✓ Less variability in penetration force
- ✓ Greater strength regardless of angle*

Testing Outcomes

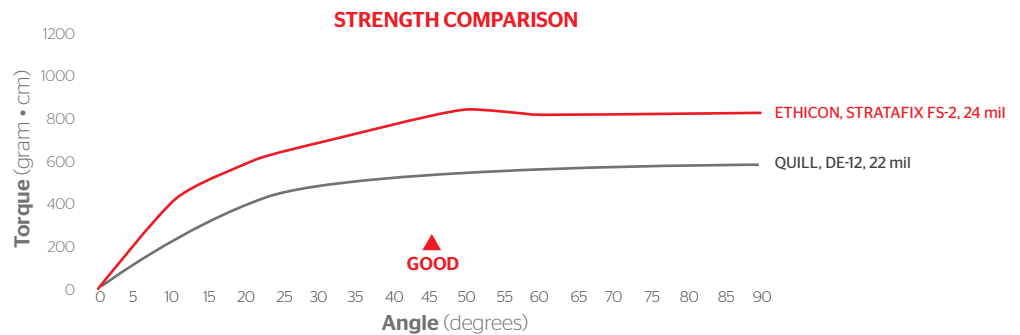
- STRATAFIX FS-2 required less penetration force than Quill DE-12 from 1 to 30 passes



- STRATAFIX FS-2 showed less variability in penetration force than Quill DE-12 from 1 to 30 passes



- STRATAFIX FS-2 displayed greater strength than Quill DE-12 regardless of the angle at which force was applied



*Overall Strength, measured as Bend Moment, is a product of Surgical Yield, Ultimate Moment, Reshape, and Stiffness characteristics.
 Reference: Technical Memo CTO9-022. January 20, 2010. Ethicon, Inc.



Needle Glossary

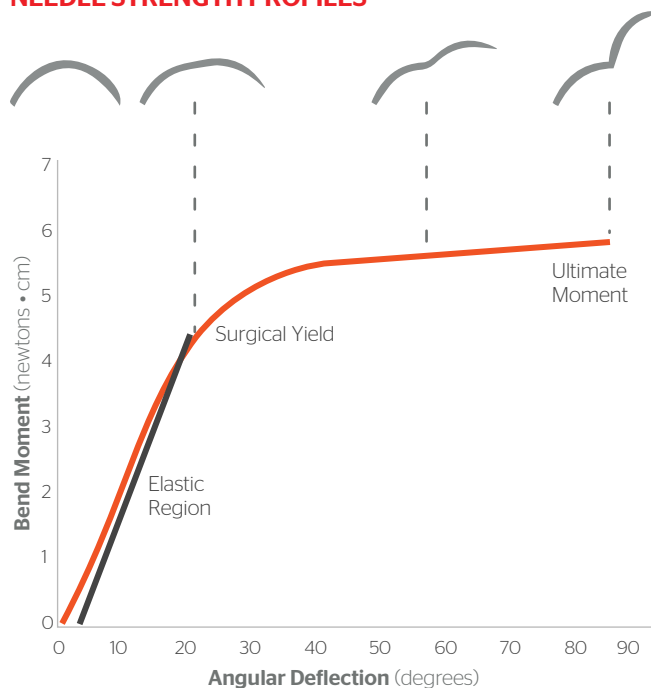
Surgical Yield

Needles will flex under pressure or load. When the pressure is released, the needle will 'spring back' to its original shape. When the pressure on the needle becomes too great, the needle will fail to return to its original shape. This is known as Surgical Yield. Needle alloy, wire diameter, needle-body geometry, and heat treatment during manufacturing are all factors that can affect a needle's ability to resist pressure. In more scientific terms, Surgical Yield may be defined as the amount of Moment required to initiate plastic deformation during bend tests. (ASTM standard F-1840-98a) Refer to Graph.

Ultimate Moment

In lab tests, a curved needle is subjected to an increasing pressure until the needle is bent 90°. The amount of pressure the needle can resist until it bends 90° is referred to as the Ultimate Moment. In more scientific terms, Ultimate Moment is defined as the maximum Moment applied during bend tests. (ASTM standard F-1840-98a) Refer to Graph.

Graph
REPRESENTATION OF
NEEDLE STRENGTH PROFILES



Ductility

Ductility is the ability of a needle to resist breaking while being bent under pressure. If a needle lacks ductility, it may break when pressure is exerted upon it. If a needle is ductile, the needle will bend under pressure before it will break. Needle designs aim to make a needle as strong as possible to resist bending, while also imparting ductility so it can bend when the force applied becomes too strong. A test known as a Reshape Test determines the ductility of a needle. In this test, a needle is bent 90° and then bent back to its original shape (or as close as the needle will allow). The more times a needle can be bent in this manner, the greater the needle's ability to resist breaking. Refer to Graph.

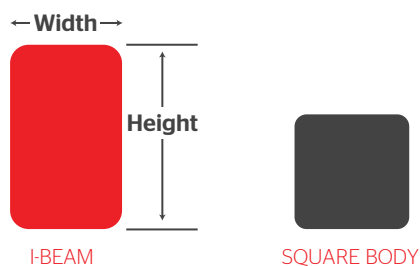
I-Beam Body

This refers to the cross-section of the needle body. In general terms, the height of the body is greater than the width of the body, as shown in the illustration. If the corners are rounded, then the body is referred to as a round corner I-beam.

Square Body

This refers to the cross-section of the needle body. In general terms, the height of the body is equal to the width of the body, as shown in the illustration.

NEEDLE BODY GEOMETRY
CROSS-SECTIONS





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

2-0 ETHIBOND EXCEL® Polyester Suture

Competitor

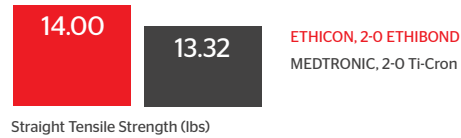
Medtronic 2-0 Ti-Cron™ Suture



- ✓ Greater straight tensile strength
- ✓ Less package memory
- ✓ Greater controlled linear elongation
- ✓ Greater knot security

Testing Outcomes

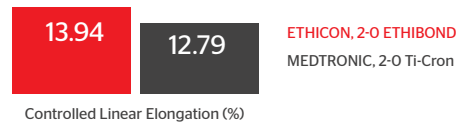
- 2-0 ETHIBOND EXCEL Suture displayed greater straight tensile strength than 2-0 Ti-Cron™ Suture



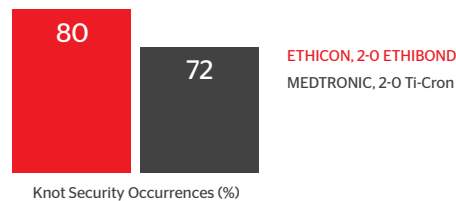
- 2-0 ETHIBOND EXCEL Suture displayed less package memory than 2-0 Ti-Cron™ Suture



- 2-0 ETHIBOND EXCEL Suture displayed greater controlled linear elongation than 2-0 Ti-Cron™ Suture



- 2-0 ETHIBOND EXCEL Suture displayed greater knot security compared to 2-0 Ti-Cron™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

2-0 ETHIBOND EXCEL® Polyester Suture

Competitor

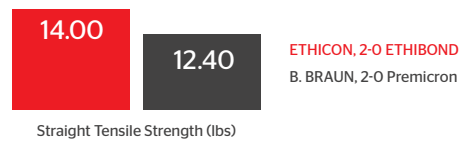
B. Braun 2-0 PremiCron® Suture



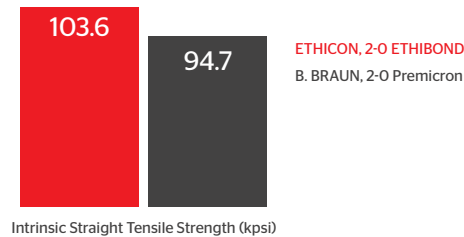
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Less package memory
- ✓ Greater controlled linear elongation
- ✓ More reliable knot slide

Testing Outcomes

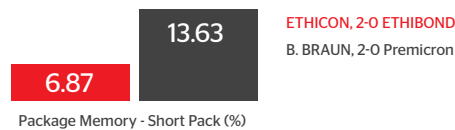
- 2-0 ETHIBOND EXCEL Suture displayed greater straight tensile strength than 2-0 PremiCron® Suture



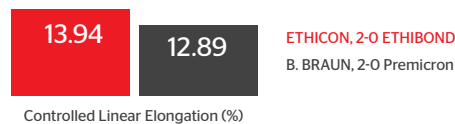
- 2-0 ETHIBOND EXCEL Suture displayed greater intrinsic straight tensile strength than 2-0 PremiCron® Suture



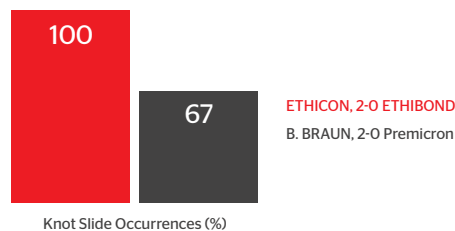
- 2-0 ETHIBOND EXCEL Suture displayed less package memory than 2-0 PremiCron® Suture



- 2-0 ETHIBOND EXCEL Suture displayed greater controlled linear elongation than 2-0 PremiCron® Suture



- 2-0 ETHIBOND EXCEL Suture displayed more reliable knot slide compared to 2-0 PremiCron® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

4-0 ETHIBOND EXCEL® Polyester Suture

Competitor

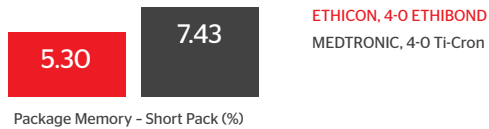
Medtronic 4-0 Ti-Cron™ Suture



✓ Less package memory

Testing Outcomes

- 4-0 ETHIBOND EXCEL Suture displayed less package memory than 4-0 Ti-Cron™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

4-0 ETHIBOND EXCEL® Polyester Suture

Competitor

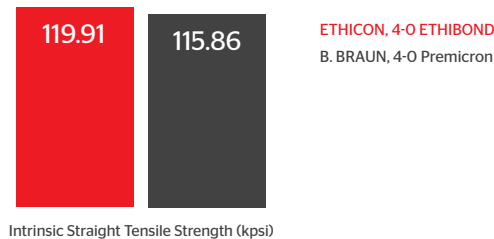
B. Braun 4-0 PremiCron® Suture



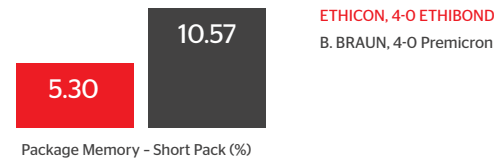
- ✓ Greater intrinsic straight tensile strength
- ✓ Less package memory
- ✓ Greater controlled linear elongation
- ✓ More reliable knot slide

Testing Outcomes

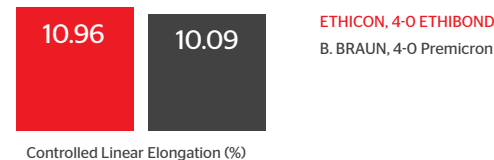
- 4-0 ETHIBOND EXCEL Suture displayed greater intrinsic straight tensile strength than 4-0 PremiCron® Suture



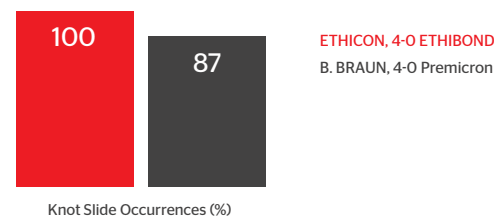
- 4-0 ETHIBOND EXCEL Suture displayed less package memory than 4-0 PremiCron® Suture



- 4-0 ETHIBOND EXCEL Suture displayed greater controlled linear elongation than 4-0 PremiCron® Suture



- 4-0 ETHIBOND EXCEL Suture displayed more reliable knot slide compared to 4-0 PremiCron® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

5-0 MONOCRYL® (poliglecaprone 25) Suture

Competitor

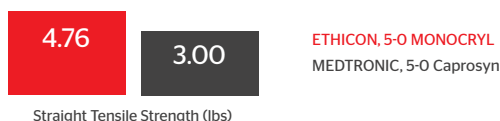
Medtronic 5-0 Caprosyn™ Suture



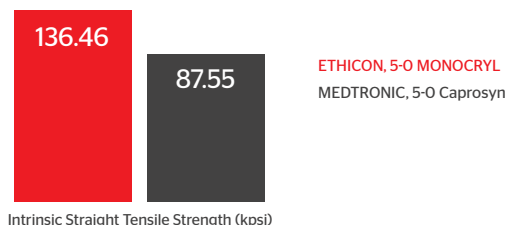
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength
- ✓ Less package memory
- ✓ More reliable knot slide

Testing Outcomes

- 5-0 MONOCRYL Suture displayed greater straight tensile strength than 5-0 Caprosyn™ Suture



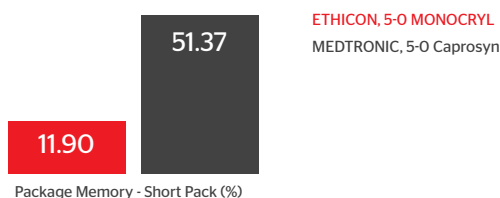
- 5-0 MONOCRYL Suture displayed greater intrinsic straight tensile strength than 5-0 Caprosyn™ Suture



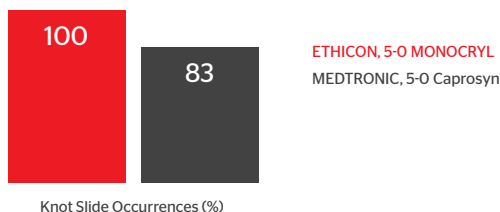
- 5-0 MONOCRYL Suture displayed greater knot tensile strength than 5-0 Caprosyn™ Suture



- 5-0 MONOCRYL Suture displayed less package memory than 5-0 Caprosyn™ Suture



- 5-0 MONOCRYL Suture displayed more reliable knot slide compared to 5-0 Caprosyn™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

5-0 MONOCRYL® (poliglecaprone 25) Suture

Competitor

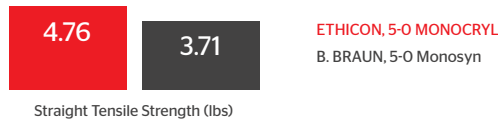
B. Braun 5-0 Monosyn® Suture



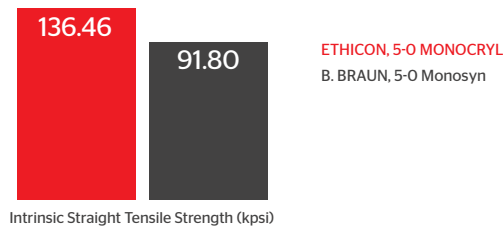
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Less package memory

Testing Outcomes

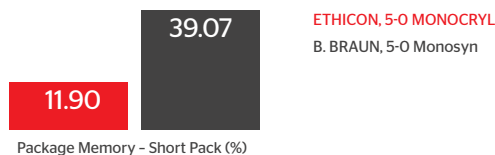
- 5-0 MONOCRYL Suture displayed greater straight tensile strength than 5-0 Monosyn® Suture



- 5-0 MONOCRYL Suture displayed greater intrinsic straight tensile strength than 5-0 Monosyn® Suture



- 5-0 MONOCRYL Suture displayed less package memory than 5-0 Monosyn® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

5-O PROLENE® Polypropylene Suture



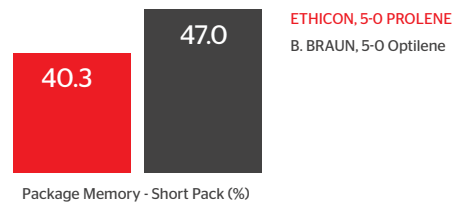
- ✓ Less package memory
- ✓ Greater controlled linear elongation

Competitor

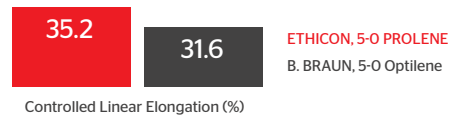
B. Braun 5-O Optilene™ Suture (Non-Absorbable)

Testing Outcomes

- 5-O PROLENE Suture displayed less package memory than 5-O Optilene™ Suture



- 5-O PROLENE Suture displayed greater controlled linear elongation than 5-O Optilene™ Suture



Ethicon Suture

5-O PROLENE® Polypropylene Suture



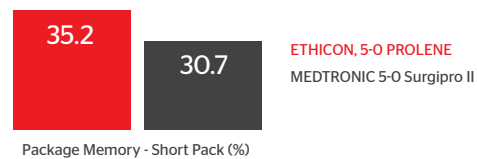
- ✓ Greater controlled linear elongation

Competitor

Medtronic 5-O Surgipro™ II Polypropylene Monofilament Suture

Testing Outcomes

- 5-O PROLENE Suture displayed greater controlled linear elongation than 5-O Surgipro™ II Suture





Ethicon Sutures

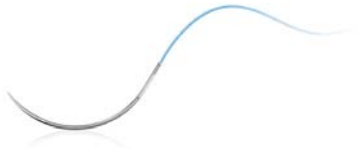
Competitive Performance Testing

Ethicon Suture

5-0 PROLENE® Polypropylene Suture

Competitor

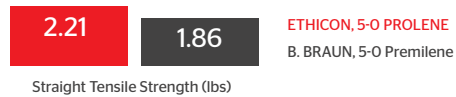
B. Braun 5-0 Premilene® Suture (Non-Absorbable)



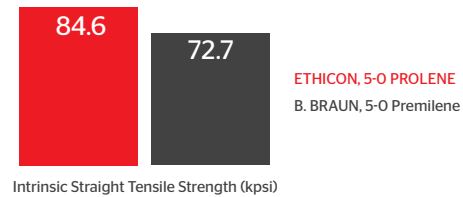
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength
- ✓ Less package memory

Testing Outcomes

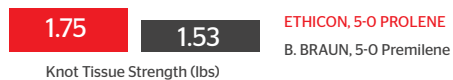
- 5-0 PROLENE Suture displayed greater straight tensile strength than 5-0 Premilene® Suture



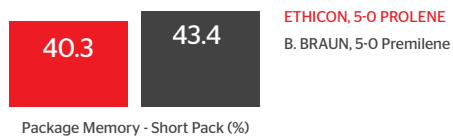
- 5-0 PROLENE Suture displayed greater intrinsic straight tensile strength than 5-0 Premilene® Suture



- 5-0 PROLENE Suture displayed greater knot tensile strength than 5-0 Premilene® Suture



- 5-0 PROLENE Suture displayed less package memory than 5-0 Premilene® Suture





Ethicon Sutures

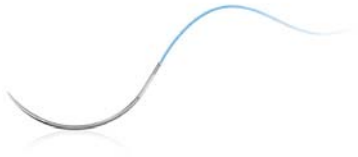
Competitive Performance Testing

Ethicon Suture

6-0 PROLENE® Polypropylene Suture

Competitor

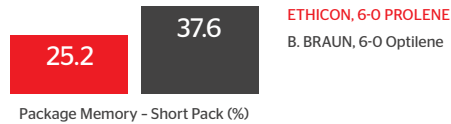
B. Braun 6-0 Optilene™ Non-Absorbable Suture



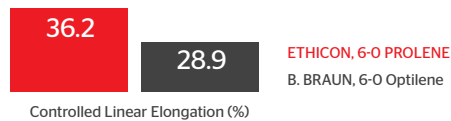
- ✓ Less package memory
- ✓ Greater controlled linear elongation

Testing Outcomes

- 6-0 PROLENE Suture displayed less package memory than 6-0 Optilene™ Non-Absorbable Suture



- 6-0 PROLENE Suture displayed greater controlled linear elongation than 6-0 Optilene™ Non-Absorbable Suture



Ethicon Suture

6-0 PROLENE® Polypropylene Suture

Competitor

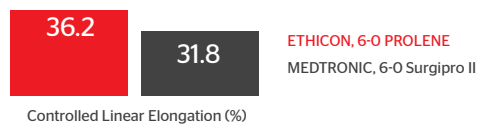
Medtronic 6-0 Surgipro™ II Polypropylene Monofilament Suture



- ✓ Greater controlled linear elongation

Testing Outcomes

- 6-0 PROLENE Suture displayed greater controlled linear elongation than 6-0 Surgipro™ II Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

6-O PROLENE® Polypropylene Suture

Competitor

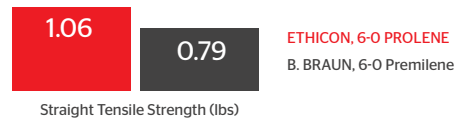
B. Braun 6-O Premilene® Suture (Non-Absorbable)



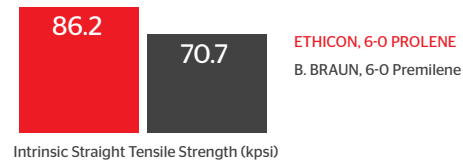
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength
- ✓ Less package memory
- ✓ Greater controlled linear elongation

Testing Outcomes

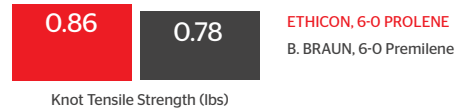
- 6-O PROLENE Suture displayed greater straight tensile strength than 6-O Premilene® Suture



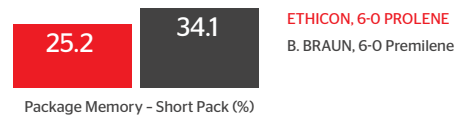
- 6-O PROLENE Suture displayed greater intrinsic straight tensile strength than 6-O Premilene® Suture



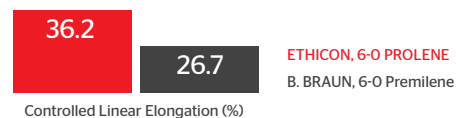
- 6-O PROLENE Suture displayed greater knot tensile strength than 6-O Premilene® Suture



- 6-O PROLENE Suture displayed less package memory than 6-O Premilene® Suture



- 6-O PROLENE Suture displayed greater controlled linear elongation than 6-O Premilene® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

7-O PROLENE® Polypropylene Suture

Competitor

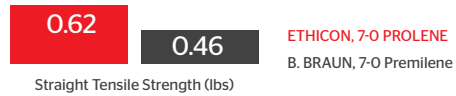
B. Braun 7-O Premilene® Suture (Non-Absorbable)



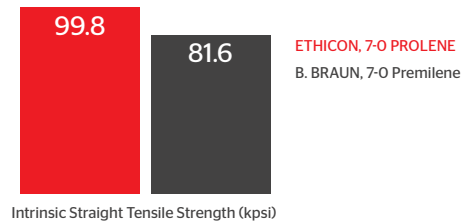
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength
- ✓ Less package memory
- ✓ Greater controlled linear elongation

Testing Outcomes

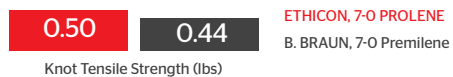
- 7-O PROLENE Suture displayed greater straight tensile strength than 7-O Premilene® Suture



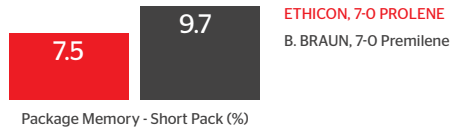
- 7-O PROLENE Suture displayed greater intrinsic straight tensile strength than 7-O Premilene® Suture



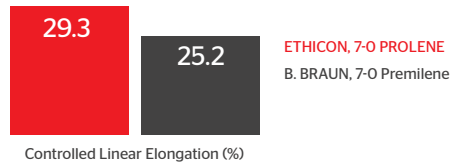
- 7-O PROLENE Suture displayed greater knot tensile strength than 7-O Premilene® Suture



- 7-O PROLENE Suture displayed less package memory than 7-O Premilene® Suture



- 7-O PROLENE Suture displayed greater controlled linear elongation than 7-O Premilene® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

8-0 PROLENE® Polypropylene Suture

Competitor

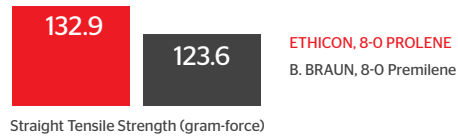
B. Braun 8-0 Premilene® Suture (Non-Absorbable)



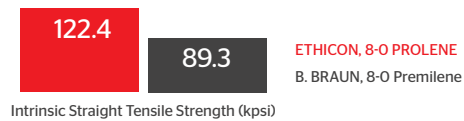
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength

Testing Outcomes

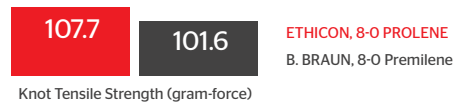
- 8-0 PROLENE Suture displayed greater straight tensile strength than 8-0 Premilene® Suture



- 8-0 PROLENE Suture displayed greater intrinsic straight tensile strength than 8-0 Premilene® Suture



- 8-0 PROLENE Suture displayed greater knot tensile strength than 8-0 Premilene® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

8-0 Oversized (OS) PROLENE® Polypropylene Suture

Competitor

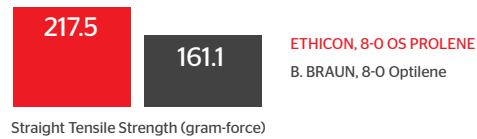
B. Braun 8-0 Optilene™ Non-Absorbable Suture



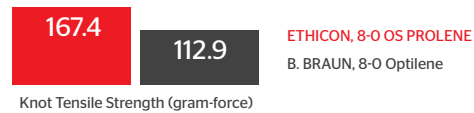
- ✓ Greater straight tensile strength
- ✓ Greater knot tensile strength
- ✓ Greater controlled linear elongation

Testing Outcomes

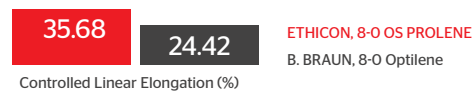
- 8-0 OS PROLENE Suture displayed greater straight tensile strength than 8-0 Optilene™ Suture



- 8-0 OS PROLENE Suture displayed greater knot tensile strength than 8-0 Optilene™ Suture



- 8-0 OS PROLENE Suture displayed greater controlled linear elongation than 8-0 Optilene™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

8-0 Oversized (OS) PROLENE® Polypropylene Suture

Competitor

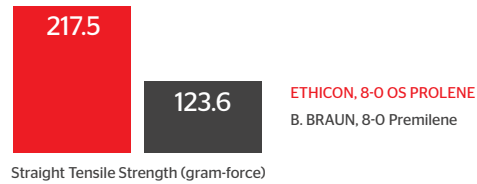
B. Braun 8-0 Premilene® Suture (Non-Absorbable)



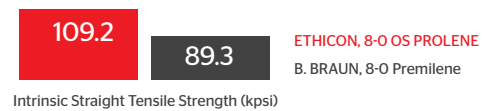
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength

Testing Outcomes

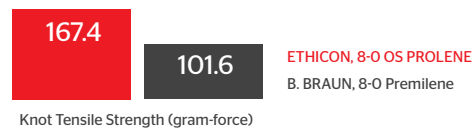
- 8-0 OS PROLENE Suture displayed greater straight tensile strength than 8-0 Premilene® Suture



- 8-0 OS PROLENE Suture displayed greater intrinsic straight tensile strength than 8-0 Premilene® Suture



- 8-0 OS PROLENE Suture displayed greater knot strength than 8-0 Premilene® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

8-0 Oversized (OS) PROLENE® Polypropylene Suture

Competitor

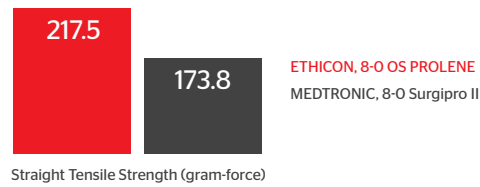
Medtronic 8-0 Surgipro™ II Polypropylene Monofilament Suture



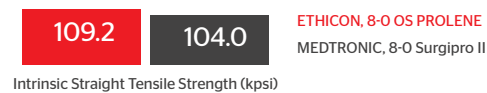
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength

Testing Outcomes

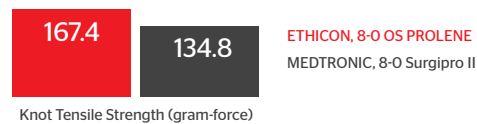
- 8-0 OS PROLENE Suture displayed greater straight tensile strength than 8-0 Surgipro™ II Suture



- 8-0 OS PROLENE Suture displayed greater intrinsic straight tensile strength than 8-0 Surgipro™ II Suture



- 8-0 OS PROLENE Suture displayed greater knot tensile strength than 8-0 Surgipro™ II Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

Size 1 Coated VICRYL® (polyglactin 910) Suture

Competitor

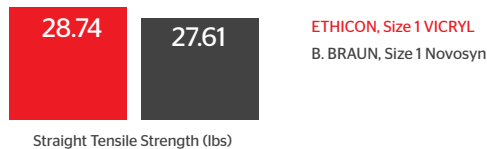
B. Braun Size 1 Novosyn® Suture



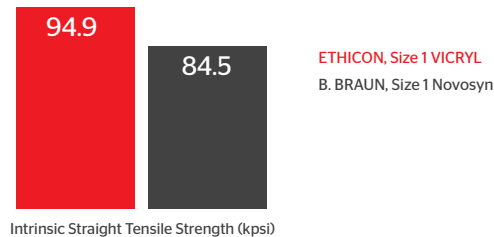
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength
- ✓ Less package memory

Testing Outcomes

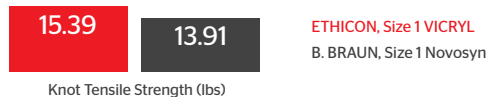
- Size 1 VICRYL Suture displayed greater straight tensile strength than size 1 Novosyn® Suture



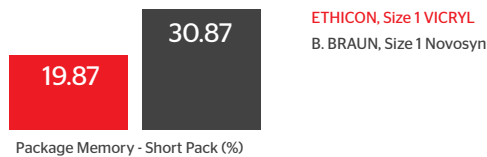
- Size 1 VICRYL Suture displayed greater intrinsic straight tensile strength than size 1 Novosyn® Suture



- Size 1 VICRYL Suture displayed greater knot tensile strength than size 1 Novosyn® Suture



- Size 1 VICRYL Suture displayed less package memory than size 1 Novosyn® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

Size 1 Coated VICRYL® Plus Antibacterial (polyglactin 910) Suture

Competitor

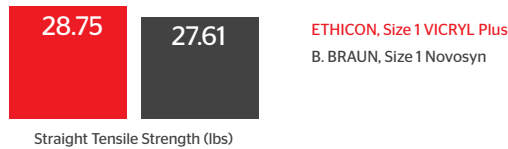
B. Braun Size 1 Novosyn® Suture



- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength

Testing Outcomes

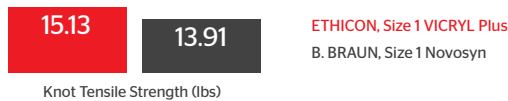
- Size 1 VICRYL Plus Suture displayed greater straight tensile strength than size 1 Novosyn® Suture



- Size 1 VICRYL Plus Suture displayed greater intrinsic straight tensile strength than size 1 Novosyn® Suture



- Size 1 VICRYL Plus Suture displayed greater knot tensile strength than size 1 Novosyn® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

Size 1 Coated VICRYL® (polyglactin 910) Suture

Competitor

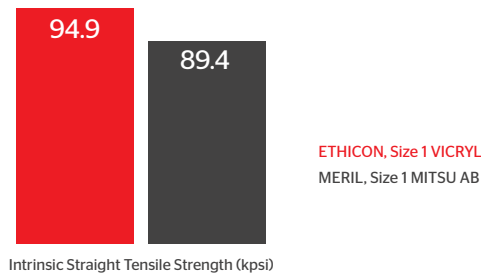
Meril Size 1 MITSU AB™ Suture



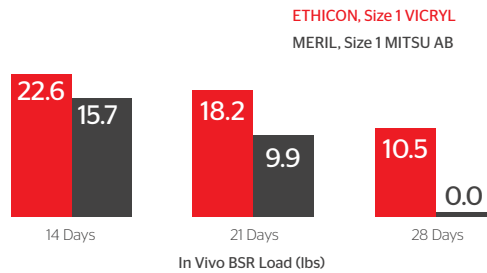
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater in vivo breaking strength retention
- ✓ Greater controlled linear elongation
- ✓ More reliable knot slide

Testing Outcomes

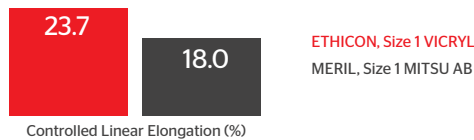
- Size 1 VICRYL Suture displayed greater intrinsic straight tensile strength than size 1 MITSU AB™ Suture



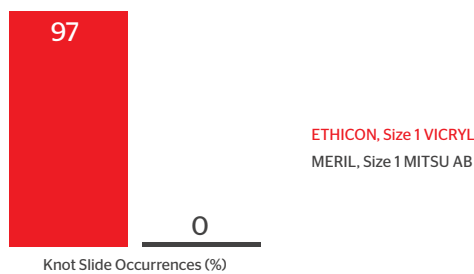
- Size 1 VICRYL Suture displayed greater in vivo breaking strength retention (BSR) at 14, 21, and 28 days compared to size 1 MITSU AB™ Suture



- Size 1 VICRYL Suture displayed greater controlled linear elongation than size 1 MITSU AB™ Suture



- Size 1 VICRYL Suture displayed more reliable knot slide compared to size 1 MITSU AB™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

Size 1 Coated VICRYL® Plus Antibacterial (polyglactin 910) Suture

Competitor

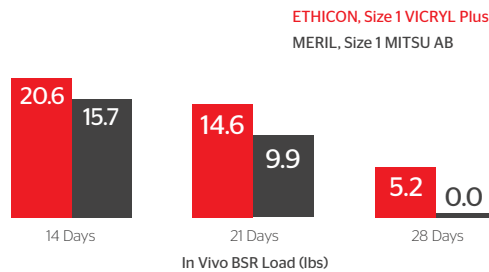
Meril Size 1 MITSU AB™ Suture



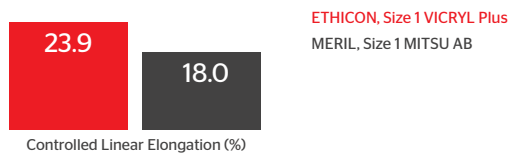
- ✓ Greater in vivo breaking strength retention
- ✓ Greater controlled linear elongation
- ✓ More reliable knot slide

Testing Outcomes

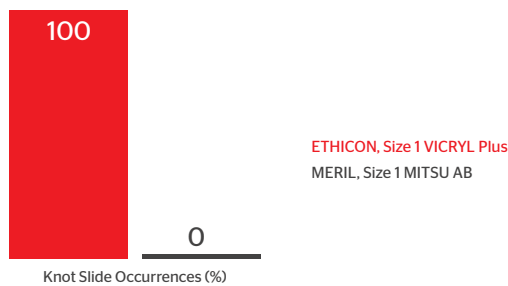
- Size 1 VICRYL Plus Suture displayed greater in vivo breaking strength retention (BSR) at 14, 21, and 28 days compared to size 1 MITSU AB™ Suture



- Size 1 VICRYL Plus Suture displayed greater controlled linear elongation than size 1 MITSU AB™ Suture



- Size 1 VICRYL Plus Suture displayed more reliable knot slide compared to size 1 MITSU AB™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

Size O Coated VICRYL® (polyglactin 910) Suture

Competitor

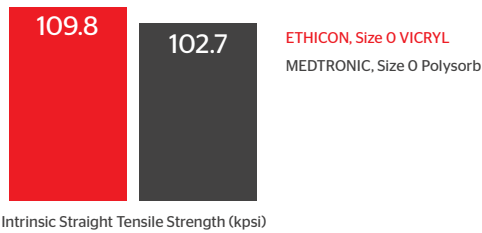
Medtronic Size O Polysorb™ Suture



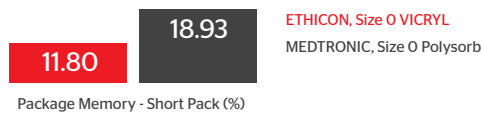
- ✓ Greater intrinsic straight tensile strength
- ✓ Less package memory
- ✓ More reliable knot slide

Testing Outcomes

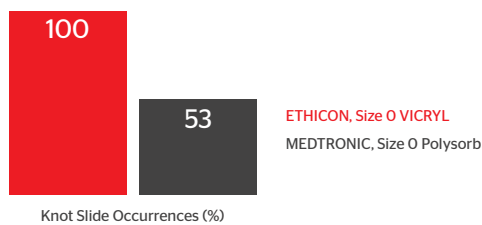
- Size O VICRYL Suture displayed greater intrinsic straight tensile strength than size O Polysorb™ Suture



- Size O VICRYL Suture displayed less package memory than size O Polysorb™ Suture



- Size O VICRYL Suture displayed more reliable knot slide compared to size O Polysorb™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

Size O Coated VICRYL® (polyglactin 910) Suture

Competitor

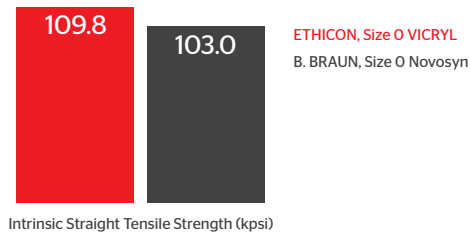
B. Braun Size O Novosyn® Suture



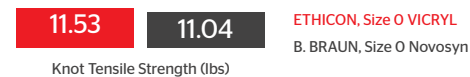
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength
- ✓ Less package memory
- ✓ Greater knot security

Testing Outcomes

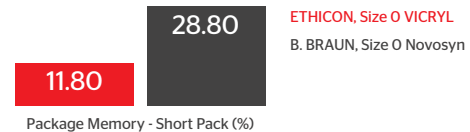
- Size O VICRYL Suture displayed greater intrinsic straight tensile strength than size O Novosyn® Suture



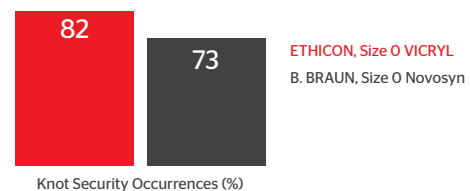
- Size O VICRYL Suture displayed greater knot tensile strength than size O Novosyn® Suture



- Size O VICRYL Suture displayed less package memory than size O Novosyn® Suture



- Size O VICRYL Suture displayed greater knot security compared to size O Novosyn® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

Size O Coated VICRYL® Plus Antibacterial (polyglactin 910) Suture

Competitor

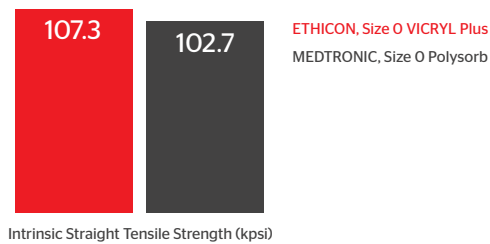
Medtronic Size O Polysorb™ Suture



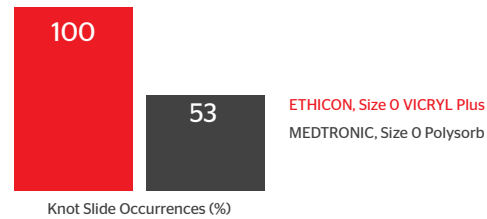
- ✓ Greater intrinsic straight tensile strength
- ✓ More reliable knot slide

Testing Outcomes

- Size O VICRYL Plus Suture displayed greater intrinsic straight tensile strength than size O Polysorb™ Suture



- Size O VICRYL Plus Suture displayed more reliable knot slide compared to size O Polysorb™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

Size 0 Coated VICRYL® Plus Antibacterial (polyglactin 910) Suture

Competitor

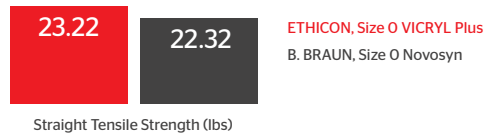
B. Braun Size 0 Novosyn® Suture



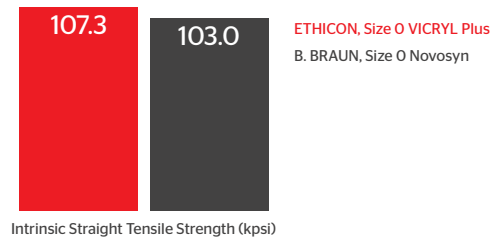
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength

Testing Outcomes

- Size 0 VICRYL Plus Suture displayed greater straight tensile strength than size 0 Novosyn® Suture



- Size 0 VICRYL Plus Suture displayed greater intrinsic straight tensile strength than size 0 Novosyn® Suture



- Size 0 VICRYL Plus Suture displayed greater knot tensile strength than size 0 Novosyn® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

2-0 Coated VICRYL® (polyglactin 910) Suture

Competitor

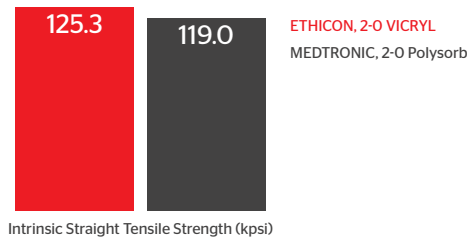
Medtronic 2-0 Polysorb™ Suture



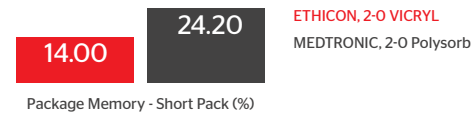
- ✓ Greater intrinsic straight tensile strength
- ✓ Less package memory
- ✓ More reliable knot slide

Testing Outcomes

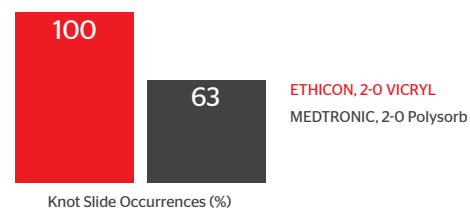
- 2-0 VICRYL Suture displayed greater intrinsic straight tensile strength than 2-0 Polysorb™ Suture



- 2-0 VICRYL Suture displayed less package memory than 2-0 Polysorb™ Suture



- 2-0 VICRYL Suture displayed more reliable knot slide compared to 2-0 Polysorb™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

2-0 Coated VICRYL® Plus Antibacterial (polyglactin 910) Suture

Competitor

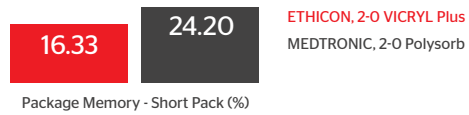
Medtronic 2-0 Polysorb™ Suture



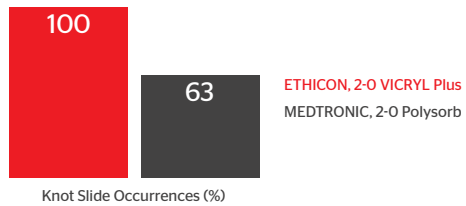
- ✓ Less package memory
- ✓ More reliable knot slide

Testing Outcomes

- 2-0 VICRYL Plus Suture displayed less package memory than 2-0 Polysorb™ Suture



- 2-0 VICRYL Plus Suture displayed more reliable knot slide compared to 2-0 Polysorb™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

2-0 Coated VICRYL® (polyglactin 910) Suture

Competitor

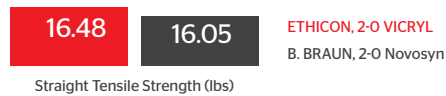
B. Braun 2-0 Novosyn® Suture



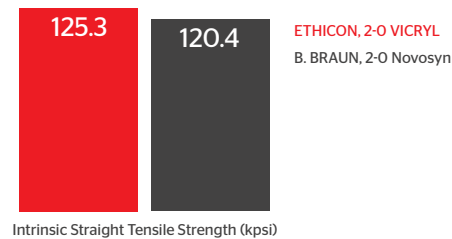
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Less package memory
- ✓ Greater knot security

Testing Outcomes

- 2-0 VICRYL Suture displayed greater straight tensile strength than 2-0 Novosyn® Suture



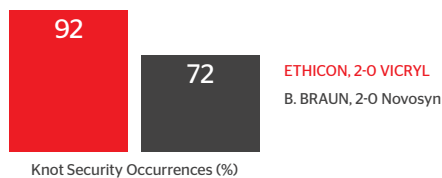
- 2-0 VICRYL Suture displayed greater intrinsic straight tensile strength than 2-0 Novosyn® Suture



- 2-0 VICRYL Suture displayed less package memory than 2-0 Novosyn® Suture



- 2-0 VICRYL Suture displayed greater knot security compared to 2-0 Novosyn® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

2-0 Coated VICRYL® Plus Antibacterial (polyglactin 910) Suture

Competitor

B. Braun 2-0 Novosyn® Suture



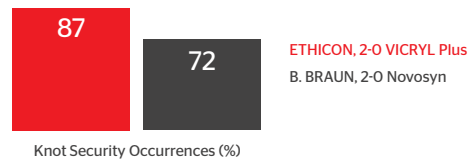
- ✓ Less package memory
- ✓ Greater knot security

Testing Outcomes

- 2-0 VICRYL Plus Suture displayed less package memory than 2-0 Novosyn® Suture



- 2-0 VICRYL Plus Suture displayed greater knot security compared to 2-0 Novosyn® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

3-O Coated VICRYL® (polyglactin 910) Suture

Competitor

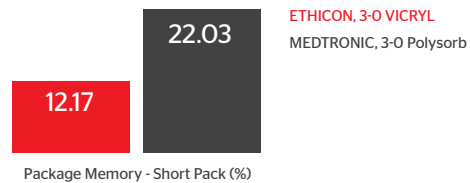
Medtronic 3-O Polysorb™ Suture



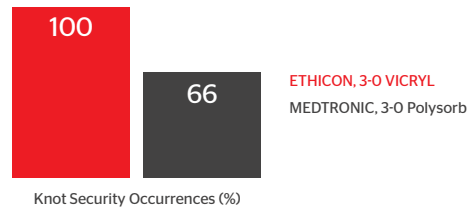
- ✓ Less package memory
- ✓ More reliable knot slide

Testing Outcomes

- 3-O VICRYL Suture displayed less package memory than 3-O Polysorb™ Suture



- 3-O VICRYL Suture displayed more reliable knot slide compared to 3-O Polysorb™ Suture



Ethicon Suture

3-O Coated VICRYL® Plus Antibacterial (polyglactin 910) Suture

Competitor

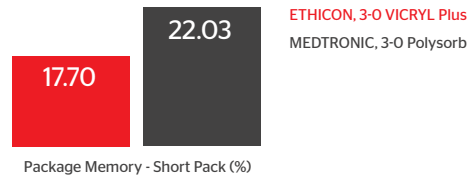
Medtronic 3-O Polysorb™ Suture



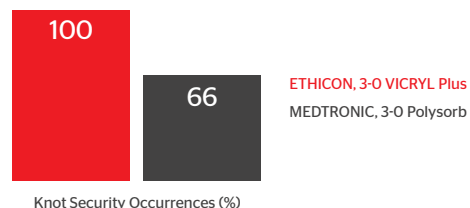
- ✓ Less package memory
- ✓ Superior knot slide characteristics

Testing Outcomes

- 3-O VICRYL Plus Suture displayed less package memory than 3-O Polysorb™ Suture



- 3-O VICRYL Plus Suture displayed more reliable knot slide compared to 3-O Polysorb™ Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

3-O Coated VICRYL® (polyglactin 910) Suture

Competitor

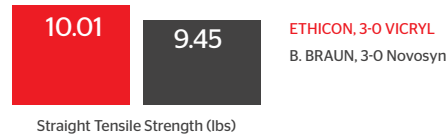
B. Braun 3-O Novosyn® Suture



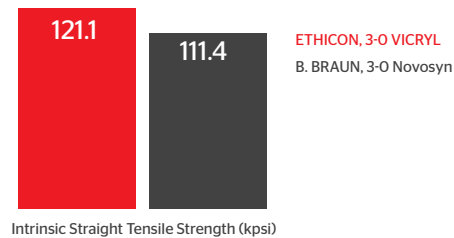
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot tensile strength
- ✓ Less package memory

Testing Outcomes

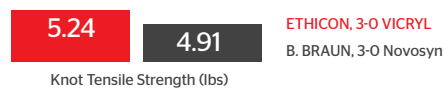
- 3-O VICRYL Suture displayed greater straight tensile strength than 3-O Novosyn® Suture



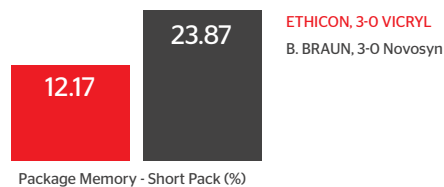
- 3-O VICRYL Suture displayed greater intrinsic straight tensile strength than 3-O Novosyn® Suture



- 3-O VICRYL Suture displayed greater knot tensile strength than 3-O Novosyn® Suture



- 3-O VICRYL Suture displayed less package memory than 3-O Novosyn® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

3-O Coated VICRYL® Plus Antibacterial (polyglactin 910) Suture

Competitor

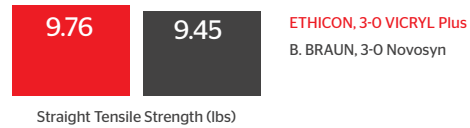
B. Braun 3-O Novosyn® Suture



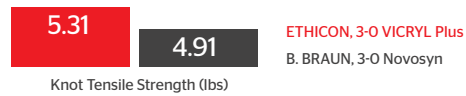
- ✓ Greater straight tensile strength
- ✓ Greater knot tensile strength
- ✓ Less package memory

Testing Outcomes

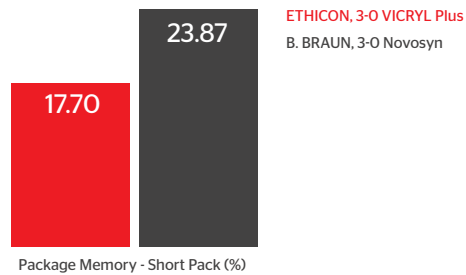
- 3-O VICRYL Plus Suture displayed greater straight tensile strength than 3-O Novosyn® Suture



- 3-O VICRYL Plus Suture displayed greater knot tensile strength than 3-O Novosyn® Suture



- 3-O VICRYL Plus Suture displayed less package memory than 3-O Novosyn® Suture





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

STRATAFIX™ Symmetric PDS™ Plus Knotless Tissue Control Device

Competitor

Medtronic V-Loc™ 180 Absorbable Wound Closure Device



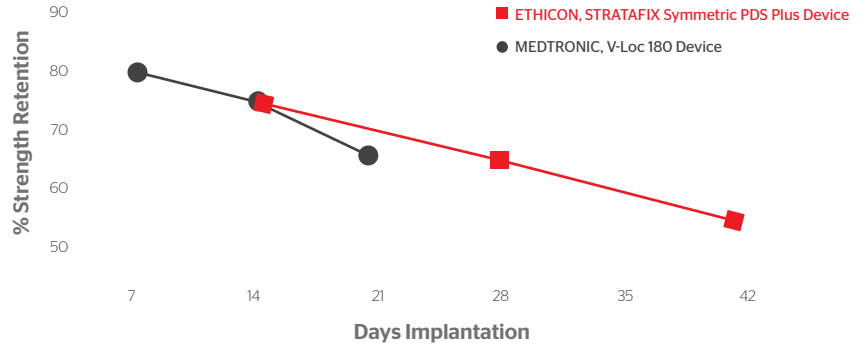
- ✓ Greater tissue-holding strength*
- ✓ Greater extended tissue support

Testing Outcomes

- STRATAFIX Symmetric PDS Plus Device displayed greater tissue-holding strength than V-Loc™ 180 Device*



- STRATAFIX Symmetric PDS Plus Device provides 6 weeks of tissue support while V-Loc™ 180 Device provides support for only 3 weeks



*In porcine fascia

References: 1. Tissue-holding comparisons, 100326296. May 26, 2015. Ethicon, Inc. 2. STRATAFIX™ Symmetric PDS™ Plus Knotless Tissue Control Device, Instructions for Use. Ethicon, Inc. Somerville, NJ. 3. V-Loc™ 180 Absorbable Wound Closure Device, Instructions for Use. Medtronic.



Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

STRATAFIX™ Spiral PDS™ Plus Knotless Tissue Control Device

Competitor

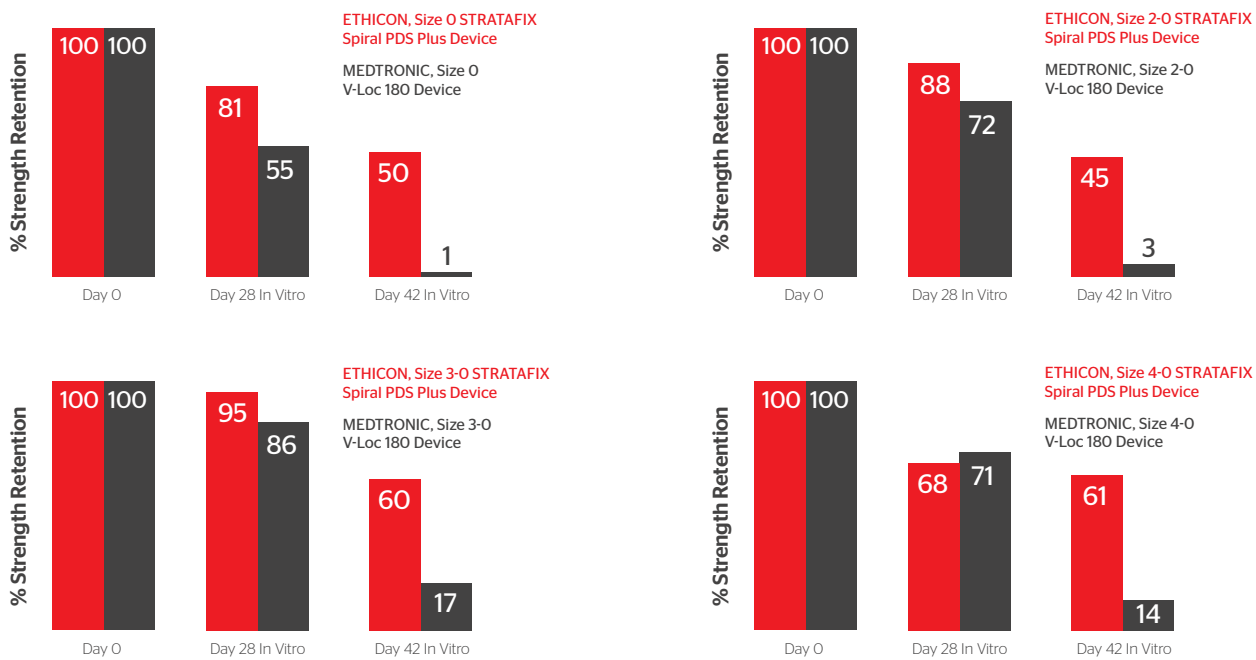
Medtronic V-Loc™ 180 Absorbable Wound Closure Device



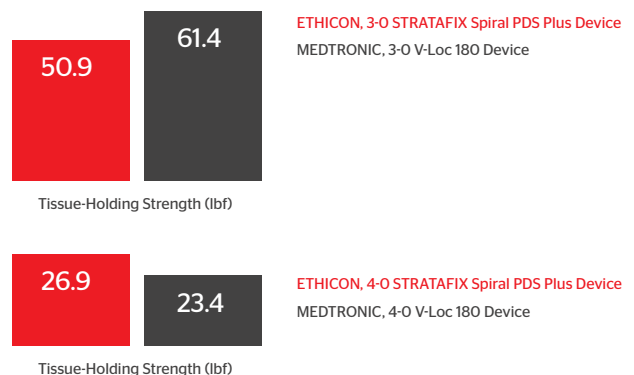
- ✓ Greater extended tissue support
- ≡ Statistically equivalent tissue-holding strength

Testing Outcomes

- STRATAFIX Spiral PDS Plus Device displayed greater extended tissue support than V-Loc™ 180 Device over a range of sizes



- STRATAFIX Spiral PDS Plus Device displayed statistically equivalent tissue-holding strength compared to V-Loc™ 180 Device over a range of sizes





Ethicon Sutures

Competitive Performance Testing

Ethicon Suture

STRATAFIX™ Spiral PDS™ Plus Knotless Tissue Control Device

Competitor

Ethicon PDS® Plus Antibacterial (polydioxanone) Suture



✓ Greater tissue-holding strength

Testing Outcomes

- STRATAFIX Spiral PDS Plus Device displayed greater tissue-holding strength than PDS Plus Suture over a range of sizes



Ethicon Suture

STRATAFIX™ Spiral MONOCRYL™ Plus Knotless Tissue Control Device

Competitor

Medtronic V-Loc™ 90 Absorbable Wound Closure Device



= Statistically equivalent tissue-holding strength

Testing Outcomes

- STRATAFIX Spiral MONOCRYL Plus Device displayed statistically equivalent tissue-holding strength compared to V-Loc™ 90 Device over a range of sizes





Ethicon Regional Sutures

Competitive Performance Testing

Ethicon Suture

2-0 ETHIBOND EXCEL® Polyester Suture

Asia-Pacific Competitor

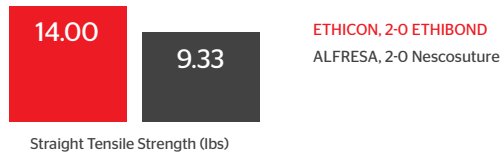
Alfresa 2-0 Nescosuture® Suture



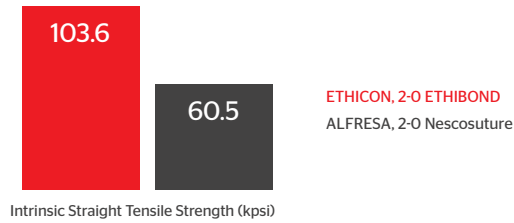
- ✓ Greater straight tensile strength
- ✓ Greater intrinsic straight tensile strength
- ✓ Greater knot security

Testing Outcomes

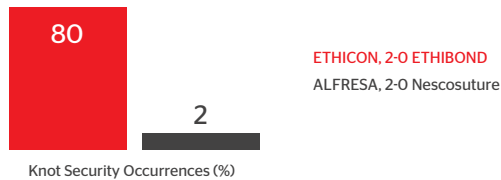
- 2-0 ETHIBOND EXCEL Suture displayed greater straight tensile strength than 2-0 Nescosuture® Suture



- 2-0 ETHIBOND EXCEL Suture displayed greater intrinsic straight tensile strength than 2-0 Nescosuture® Suture



- 2-0 ETHIBOND EXCEL Suture displayed greater knot security compared to 2-0 Nescosuture® Suture

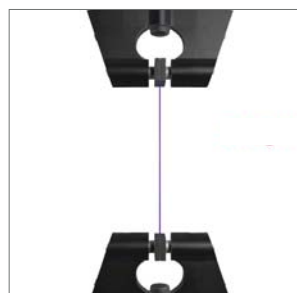




Suture Glossary

Straight Tensile Strength vs. Intrinsic Straight Tensile Strength

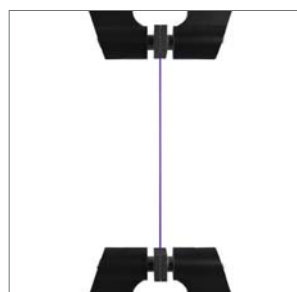
Straight tensile strength is a measure of the maximum load a suture can resist before breaking. However, in a head-to-head matchup when the diameter of one of the sutures exceeds the USP size listed on the box—known as oversizing—this measurement alone does not accurately describe which suture material is stronger. To correct for oversizing, Ethicon Edge factors in suture diameter as well as straight tensile strength to calculate intrinsic straight tensile strength. When a particular matchup yields an advantage for the Ethicon suture for intrinsic straight tensile strength, but not one for straight tensile strength, the competitive suture may have been oversized.



Straight Tensile Strength

Controlled Linear Elongation

Linear elongation is a key factor in how a suture handles and feels, and refers to how much a suture stretches under tension. Ideally, a suture should elongate to a point under tension to allow for wound edema, but then return to its original length when edema subsides to maintain the integrity of the closure. A suture that stretches more and is able to return to its original length afterwards is said to exhibit greater controlled linear elongation.



Controlled linear elongation

Knot Slide vs. Knot Security

Knot slide refers to a knot's ability to slide down the suture during tying, and it is essential to proper function. Ideally, the knot will slide completely closed and then hold firm as pressure is applied to the suture ends, eventually breaking at the knot. Failure of the knot to slide properly may indicate a poorly constructed suture or an inadequate coating.

The knot security test verifies that the knot will hold as pressure is exerted on the ends of the suture. A passing knot exhibits no movement or slippage before breaking, as indicated by a broken suture with pigtails of equal length at the conclusion of the test.



Knot Slide



Knot Security



Ethicon Topical Skin Adhesives Performance Testing

Ethicon Topical Skin Adhesive

DERMABOND ADVANCED® Topical Skin Adhesive



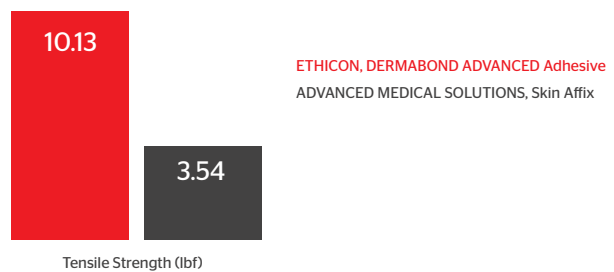
- ✓ Greater tensile strength^{1,2*}
- ✓ Faster drying time^{2,3†}

Competitor

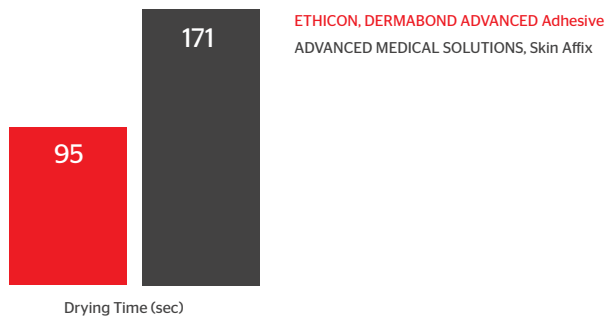
Advanced Medical Solutions Skin Affix™ Topical Skin Adhesive

Testing Outcomes

- In separate studies, DERMABOND ADVANCED Adhesive displayed greater tensile strength (2-D) than Skin Affix™^{1,2*}



- In separate studies, DERMABOND ADVANCED Adhesive displayed faster drying time than Skin Affix™^{2,3†}



*DERMABOND ADVANCED Adhesive value based on benchtop testing (O9PDO70) of porcine skin using the end-to-end skin tensile method RD-6-245 (N=50). Skin Affix™ value based on benchtop testing (AST-2013-0548) of porcine skin using end-to-end skin tensile method RD-6-245 (N=20).

†DERMABOND ADVANCED Adhesive value based on benchtop testing (11TRO53) of porcine skin heated to 33°C; product considered fully polymerized when no material transferred to cotton swab from any area of the application site (N=12). Skin Affix™ value based on benchtop testing (AST-2013-0548) of porcine skin heated to 33°C; product considered set when no adhesive transferred to cotton swab (N=20).

Ethicon Topical Skin Adhesive

DERMABOND ADVANCED® Topical Skin Adhesive



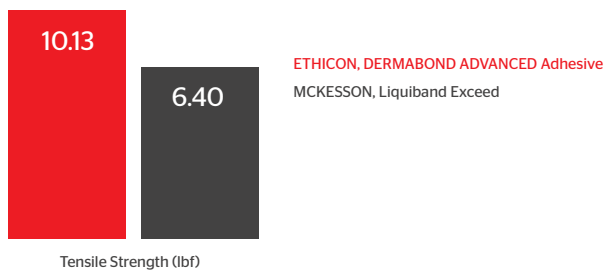
- ✓ Greater tensile strength^{1,4‡}

Competitor

McKesson Liquiband® Exceed™ Topical Skin Adhesive

Testing Outcomes

- In separate studies, DERMABOND ADVANCED Adhesive displayed greater tensile strength (2-D) than Liquiband® Exceed™^{1,4‡}



‡DERMABOND ADVANCED Adhesive value based on benchtop testing (O9PDO70) of porcine skin using the end-to-end skin tensile method RD-6-245 (N=50). Liquiband® Exceed™ value based on benchtop testing (AST-2015-0256) of porcine skin using end-to-end skin tensile method RD-6-245 (N=23).

References: 1. Protocol Report O9PDO70. January 15, 2010. Ethicon, Inc. 2. Performance Evaluation AST-2013-0548. September 30, 2014. Ethicon, Inc. 3. Technical Report 11TRO53. August 16, 2011. Ethicon, Inc. 4. Performance Evaluation AST-2015-0256. August 13, 2015. Ethicon, Inc.



Ethicon Topical Skin Adhesives

Competitive Performance Testing

Ethicon Topical Skin Adhesive

DERMABOND® PRINEO® Skin Closure System (22 cm)



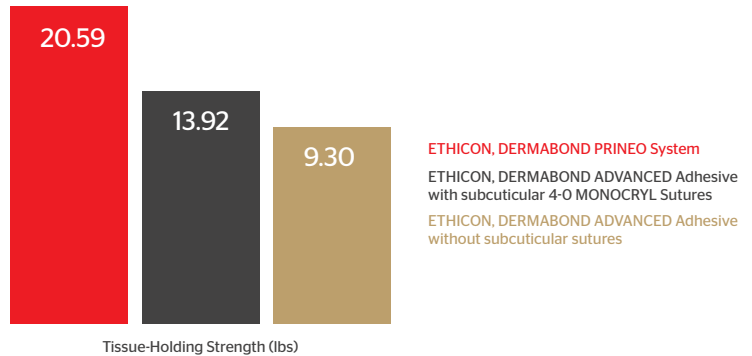
Competitor

ETHICON DERMABOND ADVANCED® Topical Skin Adhesive with and without subcuticular sutures

✓ Greater tissue-holding strength

Testing Outcomes

- DERMABOND PRINEO System displayed greater tissue-holding strength than DERMABOND ADVANCED Adhesive with or without subcuticular 4-0 MONOCRYL® (poliglecaprone 25) Sutures





Ethicon Advanced Suturing Systems

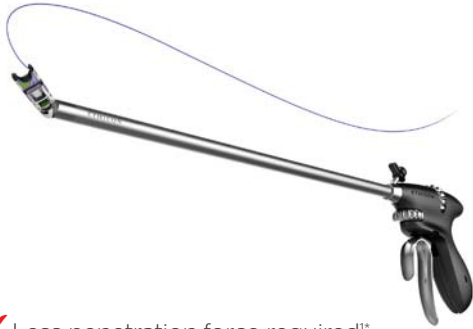
Competitive Performance Testing

Ethicon Advanced Suturing System

PROXISURE™ Suturing Device with ETHIBOND EXCEL® Polyester Suture

Competitor

Medtronic Endo Stitch™ Suturing Device with Surgidac™ Polyester Suture

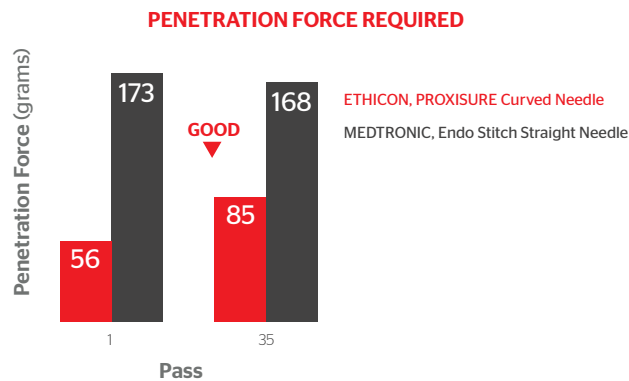


- ✓ Less penetration force required^{1*}
- ✓ Greater knot strength^{2†}

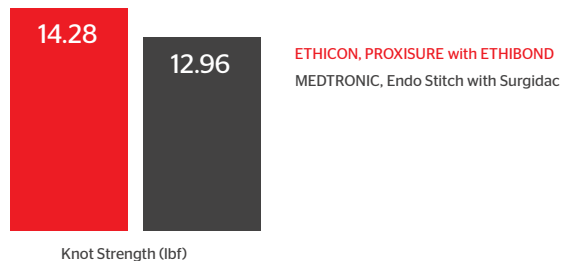
Testing Outcomes

- PROXISURE Suturing Device's curved needle required 3x less penetration force than the straight Endo Stitch™ needle^{1*}

¹Needles tested through 35 passes in 0.4 mm Permaire in accordance with TM406-080 (N=10). All measurements taken using an optical comparator or dial indicator.



- PROXISURE Suturing Device with ETHIBOND EXCEL Suture achieved greater knot strength than Endo Stitch™ with Surgidac™ suture^{2†}



²Size 2-0 sutures were tested using a benchtop method and equipment and material as described in test method DOC021468 (ETHIBOND N=19, Surgidac N=17).



Ethicon Vascular Access Device Protection

Competitive Performance Testing

Ethicon IV Protection

BIOPATCH® Protective Disk with CHG



Competitor

3M Tegaderm™ CHG Chlorhexidine Gluconate IV Securement Dressing

- ✓ 360° coverage around catheter site
- ✓ Only IV dressing with CHG proven in multiple randomized controlled trials (RCTs) to reduce incidence of catheter-related bloodstream infections (CRBSIs) in central venous and arterial catheters
- ✓ Easier removal designed to lower the risk of catheter dislodgment

Testing Outcomes

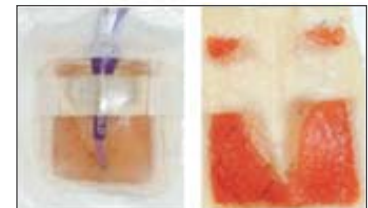
- BIOPATCH Disk allows 360° delivery of CHG around the catheter insertion site; Tegaderm™ CHG does not¹

The density of skin flora at the catheter insertion site is a major risk factor for CRBSI²

ETHICON, BIOPATCH



3M, Tegaderm

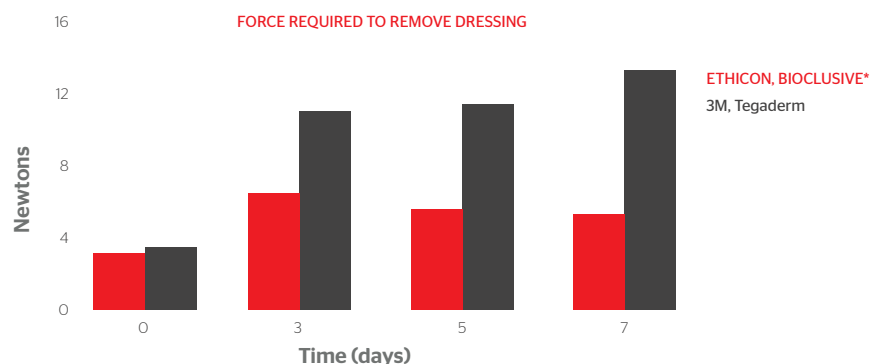


Visuals depict CHG delivery zones for each product.

- BIOPATCH Disk is the only IV dressing with CHG proven in multiple RCTs to reduce incidence of CRBSIs in central venous and arterial catheters³

Study	N	Conclusion
Maki, et al. 2000 ⁴	687	BIOPATCH Disk significantly reduced the risk of life-threatening CRBSI (1.2% in BIOPATCH group vs. 3.3% in control group, p=0.026)
Ruschulte, et al. 2009 ⁵	601	BIOPATCH Disk significantly reduced CRBSI in immunocompromised patients (6.3% in the BIOPATCH group vs. 11.3% in control group, p=0.016)
Timsit, et al. 2009 ⁶	1,636	Use of BIOPATCH Disk led to 69% decrease in CRBSI rate versus non-chlorhexidine dressings (p=0.03)

- BIOPATCH Disk allows for easier removal than Tegaderm™ CHG which may lower the risk of catheter dislodgment⁷



*BIOCLUSIVE is the securement dressing used with BIOPATCH Disk.

References: 1. Westergom C, Mistry P, Bhende S, Aickin S. Comparative In Vitro/Ex Vivo Analysis of Two Catheter-Site Insertion Dressings. Presented at the Association for Vascular Access: September 11-14, 2008. Ethicon, Inc. 2. CDC Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011. 3. Approved claim 062483-161028. Ethicon, Inc. 4. Maki DG, Mermel LA, Kluger D, et al. The Efficacy of a Chlorhexidine-Impregnated Sponge (Biopatch) for the Prevention of Intravascular Catheter-Related Infection - A Prospective, Randomized, Controlled Multicenter Study. Abstracts of the 40th Interscience Conference on Antimicrobial Agents and Chemotherapy, September 2000, p. 422. 5. Ruschulte H, Franke M, Gastmeier P, et al. Prevention of central venous catheter related infections with chlorhexidine gluconate impregnated wound dressings: a randomized controlled trial. *Ann Hematol.* 2009;88:267-272. 6. Timsit JF, Schwebel C, Bouadma L, et al. Chlorhexidine-Impregnated Sponges and Less Frequent Dressing Changes for Prevention of Catheter-Related Infections in Critically Ill Adults. *JAMA.* 2009;301(12):1231-124. 7. Document BP-470-10-12/12. In Vitro Comparative Analysis of a Chlorhexidine Gluconate (CHG) Impregnated Sponge Dressing and a CHG-containing Hydrogel Dressing, 2010. Ethicon, Inc.



Ethicon Vascular Access Device Protection

Competitive Performance Testing

Ethicon IV Protection

BIOPATCH® Protective Disk with CHG

Competitor

Medline Aegis™ CHG-Impregnated Foam Disc



- ✓ BIOPATCH Disk is the only IV dressing with CHG proven in multiple randomized controlled trials (RCTs) to reduce incidence of catheter-related bloodstream infections (CRBSIs) in central venous and arterial catheters
- ✓ BIOPATCH Disk meets the updated CDC 1A guideline as stated in the “2017 Updated Recommendations on the Use of Chlorhexidine-Impregnated Dressings for Prevention of Intravascular Catheter-Related Infections”

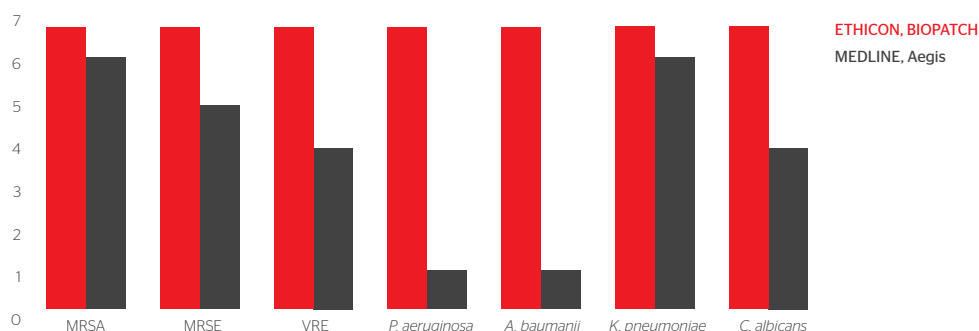
Testing Outcomes

- BIOPATCH Disk is the only IV dressing with CHG proven in multiple RCTs to reduce incidence of CRBSIs in central venous and arterial catheters¹

Study	N	Conclusion
Maki, et al. 2000 ²	687	BIOPATCH Disk significantly reduced the risk of life-threatening CRBSI (1.2% in BIOPATCH group vs. 3.3% in control group, p=0.026)
Ruschulte, et al. 2009 ³	601	BIOPATCH Disk significantly reduced CRBSI in immunocompromised patients (6.3% in the BIOPATCH group vs. 11.3% in control group, p=0.016)
Timsit, et al. 2009 ⁴	1,636	Use of BIOPATCH Disk led to 69% decrease in CRBSI rate versus non-chlorhexidine dressings (p=0.03)

- Unlike Aegis, BIOPATCH Disk meets the updated CDC 1A guideline as stated in the “2017 Updated Recommendations on the Use of Chlorhexidine-Impregnated Dressings for Prevention of Intravascular Catheter-Related Infections”

DAYS WITH SUSTAINED MICROBICIDAL ACTIVITY UNDER THE DRESSING^{5*}



*Swab test results

References: 1. Approved claim 062483-161028. Ethicon, Inc. 2. Maki DG, Mermel LA, Kluger D, et al. The Efficacy of a Chlorhexidine-Impregnated Sponge (Biopatch) for the Prevention of Intravascular Catheter-Related Infection - A Prospective, Randomized, Controlled Multicenter Study. Abstracts of the 40th Interscience Conference on Antimicrobial Agents and Chemotherapy, September 2000, p. 422. 3. Ruschulte H, Franke M, Gastmeier P, et al. Prevention of central venous catheter related infections with chlorhexidine gluconate impregnated wound dressings: a randomized controlled trial. *Ann Hematol.* 2009;88:267-272. 4. Timsit JF, Schwebel C, Bouadma L, et al. Chlorhexidine-Impregnated Sponges and Less Frequent Dressing Changes for Prevention of Catheter-Related Infections in Critically Ill Adults. *JAMA.* 2009;301(12):1231-124. 5. BIOPATCH, Guardiva, Aegis. Study report for in vitro microbiological evaluation of Antimicrobial Barrier Dressings using zone of inhibition assay. June 28, 2016. Ethicon, Inc.



Ethicon Vascular Access Device Protection

Competitive Performance Testing

Ethicon IV Protection

BIOPATCH® Protective Disk with CHG



Competitor

Bard GuardIVa® Antimicrobial Hemostatic IV Dressing

- ✓ BIOPATCH Disk is the only IV dressing with CHG proven in multiple randomized controlled trials (RCTs) to reduce incidence of catheter-related bloodstream infections (CRBSIs) in central venous and arterial catheters
- ✓ BIOPATCH Disk meets the updated CDC 1A guideline as stated in the “2017 Updated Recommendations on the Use of Chlorhexidine-Impregnated Dressings for Prevention of Intravascular Catheter-Related Infections”

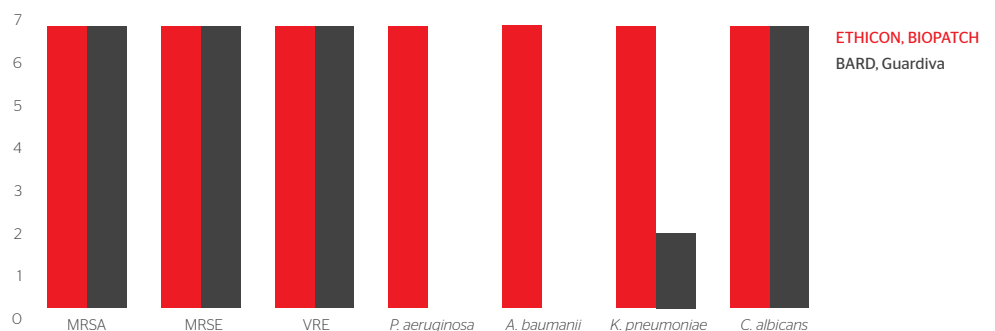
Testing Outcomes

- BIOPATCH Disk is the only IV dressing with CHG proven in multiple RCTs to reduce incidence of CRBSIs in central venous and arterial catheters¹

Study	N	Conclusion
Maki, et al. 2000 ²	687	BIOPATCH Disk significantly reduced the risk of life-threatening CRBSI (1.2% in BIOPATCH group vs. 3.3% in control group, p=0.026)
Ruschulte, et al. 2009 ³	601	BIOPATCH Disk significantly reduced CRBSI in immunocompromised patients (6.3% in the BIOPATCH group vs. 11.3% in control group, p=0.016)
Timsit, et al. 2009 ⁴	1,636	Use of BIOPATCH Disk led to 69% decrease in CRBSI rate versus non-chlorhexidine dressings (p=0.03)

- Unlike GuardIVa®, BIOPATCH Disk meets the updated CDC 1A guideline as stated in the “2017 Updated Recommendations on the Use of Chlorhexidine-Impregnated Dressings for Prevention of Intravascular Catheter-Related Infections”

DAYS WITH SUSTAINED MICROBICIDAL ACTIVITY UNDER THE DRESSING^{5*}



*Swab test results

References: 1. Approved claim 062483161028. Ethicon, Inc. 2. Maki DG, Mermel LA, Kluger D, et al. The Efficacy of a Chlorhexidine-Impregnated Sponge (Biopatch) for the Prevention of Intravascular Catheter-Related Infection - A Prospective, Randomized, Controlled Multicenter Study. Abstracts of the 40th Interscience Conference on Antimicrobial Agents and Chemotherapy, September 2000, p. 422. 3. Ruschulte H, Franke M, Gastmeier P, et al. Prevention of central venous catheter related infections with chlorhexidine gluconate impregnated wound dressings: a randomized controlled trial. *Ann Hematol*. 2009;88:267-272. 4. Timsit JF, Schwebel C, Bouadma L, et al. Chlorhexidine-Impregnated Sponges and Less Frequent Dressing Changes for Prevention of Catheter-Related Infections in Critically Ill Adults. *JAMA*. 2009;301(12):1231-124. 5. BIOPATCH, Guardiva, Aegis. Study report for in vitro microbiological evaluation of Antimicrobial Barrier Dressings using zone of inhibition assay. June 28, 2016. Ethicon, Inc.



Ethicon Vascular Access Device Protection

Competitive Performance Testing

Ethicon IV Protection

BIOPATCH® Protective Disk with CHG

Competitor

Medtronic Kendall™ AMD Antimicrobial Foam Disc Dressing



- ✓ BIOPATCH Disk is the only IV dressing with CHG proven in multiple randomized controlled trials (RCTs) to reduce incidence of catheter-related bloodstream infections (CRBSIs) in central venous and arterial catheters
- ✓ BIOPATCH Disk meets the updated CDC 1A guideline as stated in the “2017 Updated Recommendations on the Use of Chlorhexidine-Impregnated Dressings for Prevention of Intravascular Catheter-Related Infections”

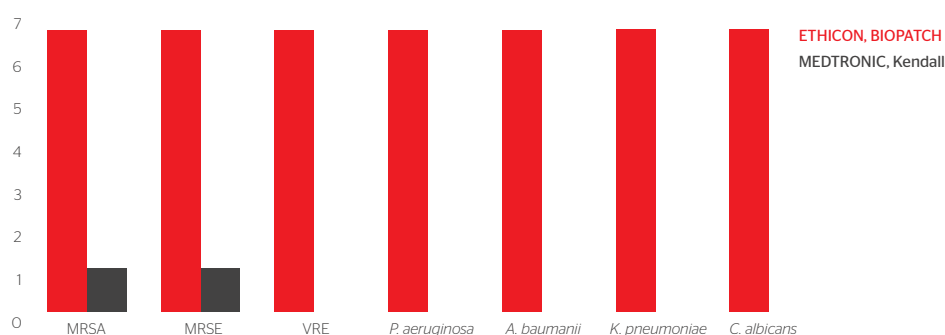
Testing Outcomes

- BIOPATCH Disk is the only IV dressing with CHG proven in multiple RCTs to reduce incidence of CRBSIs in central venous and arterial catheters¹

Study	N	Conclusion
Maki, et al. 2000 ²	687	BIOPATCH Disk significantly reduced the risk of life-threatening CRBSI (1.2% in BIOPATCH group vs. 3.3% in control group, p=0.026)
Ruschulte, et al. 2009 ³	601	BIOPATCH Disk significantly reduced CRBSI in immunocompromised patients (6.3% in the BIOPATCH group vs. 11.3% in control group, p=0.016)
Timsit, et al. 2009 ⁴	1,636	Use of BIOPATCH Disk led to 69% decrease in CRBSI rate versus non-chlorhexidine dressings (p=0.03)

- Unlike Kendall™, BIOPATCH Disk meets the updated CDC 1A guideline as stated in the “2017 Updated Recommendations on the Use of Chlorhexidine-Impregnated Dressings for Prevention of Intravascular Catheter-Related Infections”

DAYS WITH SUSTAINED MICROBICIDAL ACTIVITY UNDER THE DRESSING^{5*}



For complete indications, contraindications, warnings, precautions, and adverse reactions, please reference full package insert.

*Swab test results

References: 1. Approved claim 062483-161028. Ethicon, Inc. 2. Maki DG, Mermel LA, Kluger D, et al. The Efficacy of a Chlorhexidine-Impregnated Sponge (Biopatch) for the Prevention of Intravascular Catheter-Related Infection - A Prospective, Randomized, Controlled Multicenter Study. Abstracts of the 40th Interscience Conference on Antimicrobial Agents and Chemotherapy, September 2000, p. 422. 3. Ruschulte H, Franke M, Gastmeier P, et al. Prevention of central venous catheter related infections with chlorhexidine gluconate impregnated wound dressings: a randomized controlled trial. *Ann Hematol.* 2009;88:267-272. 4. Timsit JF, Schwebel C, Bouadma L, et al. Chlorhexidine-Impregnated Sponges and Less Frequent Dressing Changes for Prevention of Catheter-Related Infections in Critically Ill Adults. *JAMA.* 2009;301(12):1231-1234. 5. BIOPATCH-PHMB. Study report for in vitro microbiological evaluation of Antimicrobial Barrier Dressings using zone of inhibition assay. June 28, 2016. Ethicon, Inc.