A New Era for Vascular Access: Evidence-Based Strategies for Optimizing AV Fistula Creation and Maintenance

Virtual LINC 2021
Medtronic-Sponsored AV Symposium

Monday January 25th, 2021
11:30 am – 12:25 pm Central European Time
(5:30 am – 6:25 am EST)

Andrew Holden, MBChB

Jeff Hull, MD

Alexandros Mallios, MD

Tobias Steinke, MD

Disclaimers

This program is provided for general educational purposes only and should not be considered the exclusive source for this type of information. This training does not replace or supersede approved labeling. The content will be shared with healthcare professionals who seek a deeper understanding of the operation and use of Medtronic products and therapies with the intent of enhancing their knowledge of features and operations described in the clinician manuals. The patient data represented has been changed or removed to protect the privacy of the patient and is designed for educational purposes. At all times, it is the professional responsibility of the practitioner to exercise independent clinical judgment in a particular situation. Changes in a patient's disease and/or medications may alter the efficacy of a device or related features and results may vary.

Compensation

This faculty is being paid as a consultant for the services being provided and will be reported in accordance with the Physicians Payments Sunshine Act (PPSA).

Off-Label Use

- This program, sponsored by Medtronic, is intended to educate and train customers on the approved therapies and FDA indicated uses of Medtronic products.
- Medtronic product Instructions for Use can be found at http://manuals.medtronic.com/
- For questions related to an unapproved use of a Medtronic product, please contact Medtronic's Peripheral Office of Medical Affairs. Email: rs.oma@medtronic.com

Indications, Safety, Warnings

Caution Statement
The content, case study, images, logos, charts, information, and opinions are those of the physician faculty presenting the material and do not necessarily reflect the opinions or position of Medtronic. The materials presented here are provided by and used with permission from the physician faculty. This information is intended only for users in markets where Medtronic products and therapies are approved or available for use as indicated within respective product manuals. Content on specific Medtronic products and therapies is not intended for users in markets that do not have authorization for use.

If you are located in the United States, please refer to the brief statement(s) at the end of this presentation to review applicable indications, safety and warning information. See the device manual for detailed information regarding the implant procedure, indications, contraindications, warnings, precautions, and potential complications/adverse events. For further information, please call Medtronic at 1.763.514.4000 and/or consult the Medtronic website at www.medtronic.com.

If you are located outside the United States, see the device manual for detailed information regarding instructions for use, the implant procedure, indications, contraindications, warnings, precautions, and potential adverse events. For further information, contact your local Medtronic representative and/or consult the Medtronic website at www.medtronic.eu.

For applicable products, consult instructions for use on manuals.medtronic.com. Manuals can be viewed using a current version of any major internet browser. For best results, use Adobe Acrobat® Reader with the browser.

A New Era for Vascular Access:
Evidence-Based Strategies for Optimizing AV Fistula Creation and Maintenance

Introduction	Andrew Holden, MBChB
Endovascular or Surgical AV Access Creation: Which Option for Which Patient?	Alexandros Mallios, MD
Discussion	Panel
Challenges in AV Access Maintenance: Treating the Cephalic Arch	Jeff Hull, MD
Discussion	Panel
My AV Access Maintenance Algorithm	Tobias Steinke, MD
Discussion	Panel

Disclosures

Andrew Holden, MBChB, FRANZCR

I have the following potential conflicts of interest to report:

- ☑ Consulting: Medtronic, Boston Scientific, Gore
- ☐ Employment in industry
- ☐ Stockholder of a healthcare company
- ☐ Owner of a healthcare company
- ☑ Other(s)

  Research, clinical trial, or drug study funds received from: Medtronic, Boston Scientific, Gore, Cook, BD-Bard, Shockwave, Abbott, Intact, Reflow, Merit, Surmodics

  Honoraria received from: Medtronic, Boston Scientific, Gore

- ☐ I do not have any potential conflict of interest

IN.PACT AV Access Study

Six-month Results Recently Published in The New England Journal of Medicine

The New England Journal of Medicine

Original Article

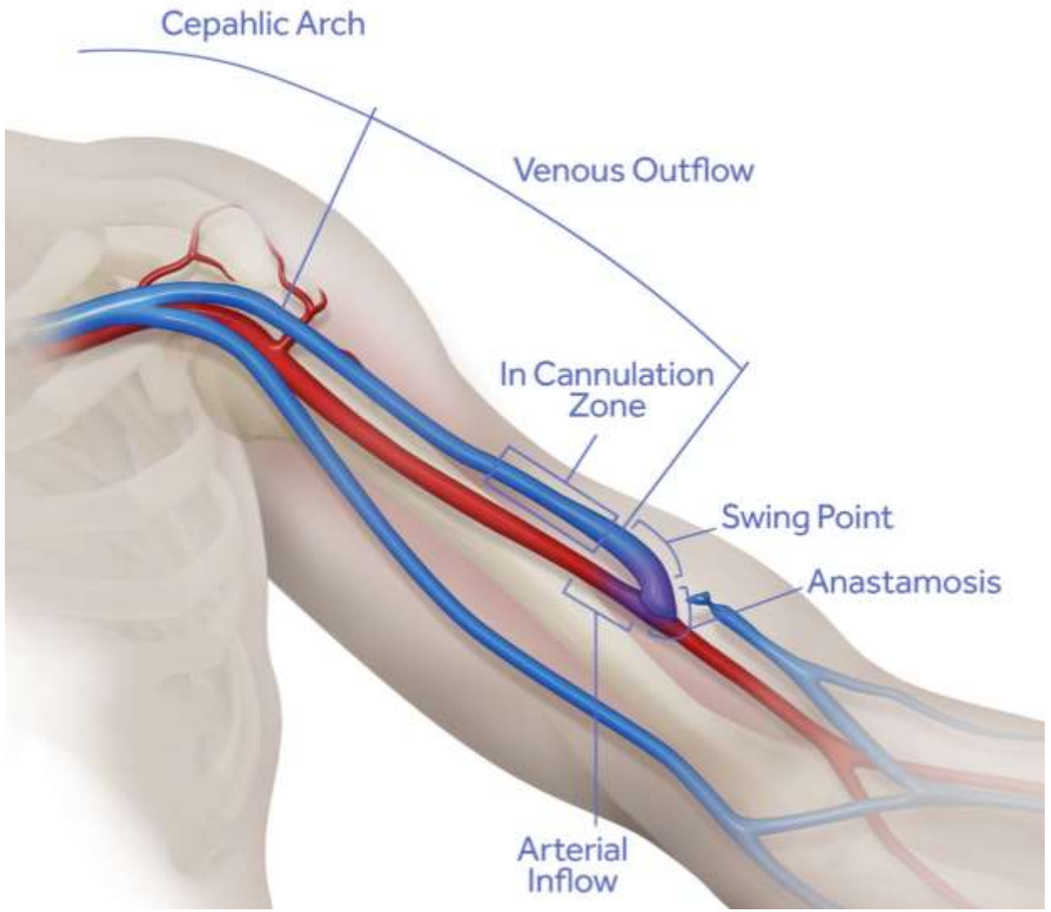
Drug-Coated Balloons for Dysfunctional Dialysis Arteriovenous Fistulas

Robert A. Lookstein, M.D., M.H.C.D.L., Hiroaki Haruguchi, M.D., Kenneth Ouriel, M.D., M.B.A., Ido Weinberg, M.D., Lanyu Lei, Ph.D., Stephanie Cihlar, B.S., and Andrew Holden, M.B., Ch.B., for the IN.PACT AV Access Investigators*

Lookstein R, et al. N Engl J Med 2020;383:733-42.

IN.PACT AV Access Lesion Characteristics

Lesion Characteristics	IN.PACT AV DCB (n=170)	Standard PTA (n=160)	P-value
Lesion Type			0.905
De Novo	30.0% (51/170)	30.6% (49/160)	
Restenotic	**70.0% (119/170)**	**69.4% (111/160)**	
Target Lesion Location[1, 2]			0.310
Arterial Inflow	2.4% (4/170)	4.4% (7/160)	
Anastomosis	**25.9% (44/170)**	**25.0% (40/160)**	
Swing Point	8.2% (14/170)	7.5% (12/160)	
In Cannulation Zone	14.7% (25/170)	7.5% (12/160)	
Venous Outflow	**31.2% (53/170)**	**33.1% (53/160)**	
Cephalic Arch	**17.6% (30/170)**	**22.5% (36/160)**	



DCB, drug-coated balloon; PTA, percutaneous transluminal angioplasty

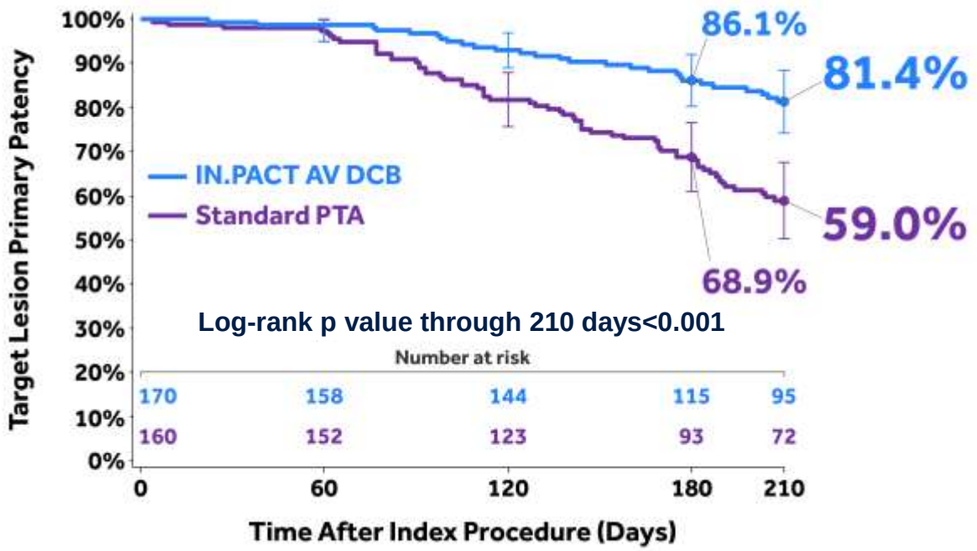
1. Target lesion location was site-reported
2. Lesion definitions:

Arterial Inflow: treated segment is isolated to the arterial side
Anastomosis: treated segment crosses or meets the AV anastomosis
Swing Point: treated segment includes the curved segment of mobilized vessel
In Cannulation Zone: treated segment is isolated to straight segment of vessel where cannulation is performed
Venous Outflow: treated segment is in basilic vein (non-mobilized) or distal to the cephalo-axillary junction
Cephalic Arch: treated segment includes curved segment of cephalic vein as the vein crosses between the pectoralis major and deltoid muscles

IN.PACT AV DCB is approved in the United States, Canada, and Japan for treatment, after appropriate vessel preparation, of obstructive lesions up to 100 mm in length in the native arteriovenous dialysis fistulae with reference vessel diameters of 4 to 12 mm

Target Lesion Primary Patency in Context – 6 Months

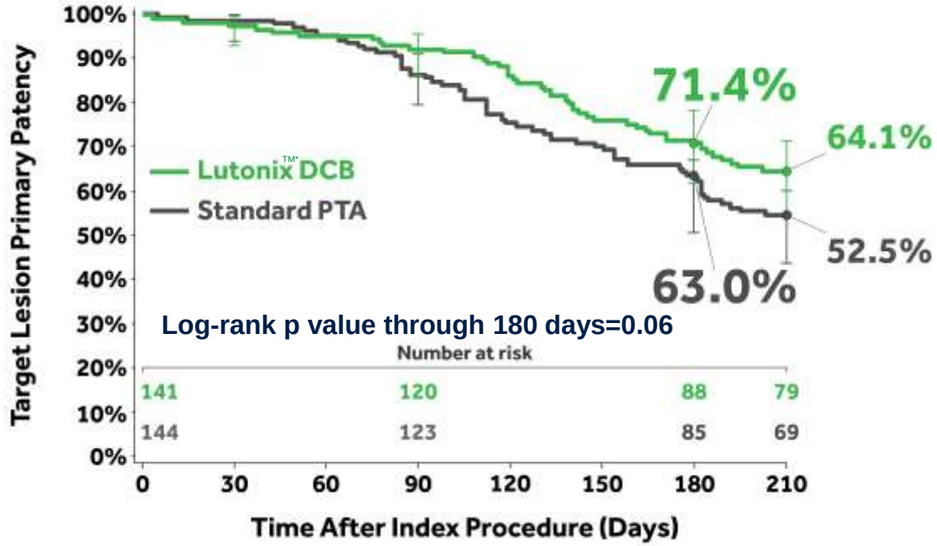
IN.PACT AV Access IDE[1]: Multicenter, global, prospective, randomized, core laboratory and clinical events committee adjudicated trial of 330 participants



The **primary effectiveness endpoint** was **target lesion primary patency at 6 months** defined as freedom from clinically driven reintervention of the target lesion or access circuit thrombosis

Primary efficacy endpoint MET

Lutonix AV IDE[2, 3]: Multicenter, prospective, randomized, core laboratory and clinical events committee adjudicated trial of 285 participants



The **primary effectiveness endpoint** was **target lesion primary patency at 6 months** defined as freedom from clinically driven reintervention of the target lesion or access circuit thrombosis

Primary efficacy endpoint NOT MET

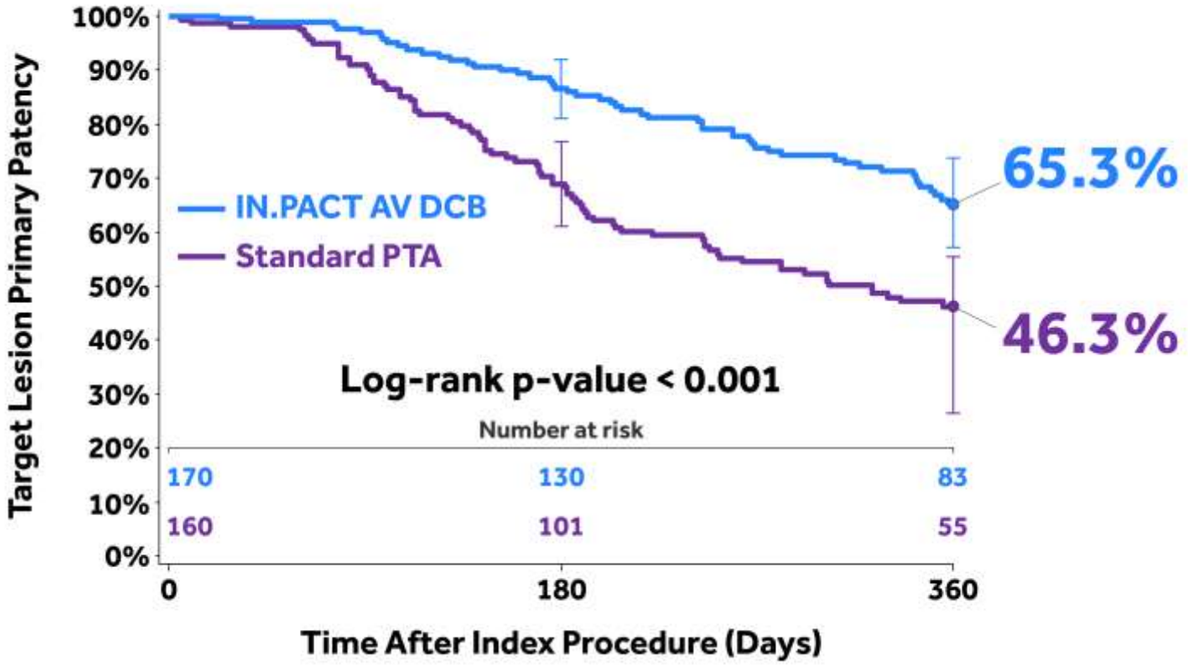
Results are not directly comparable. Primary patency rates may be defined differently. Information provided is for illustration purposes only, and may differ in head-to-head comparison

IN.PACT AV DCB is approved in the United States, Canada, and Japan for treatment, after appropriate vessel preparation, of obstructive lesions up to 100 mm in length in the native arteriovenous dialysis fistulae with reference vessel diameters of 4 to 12 mm

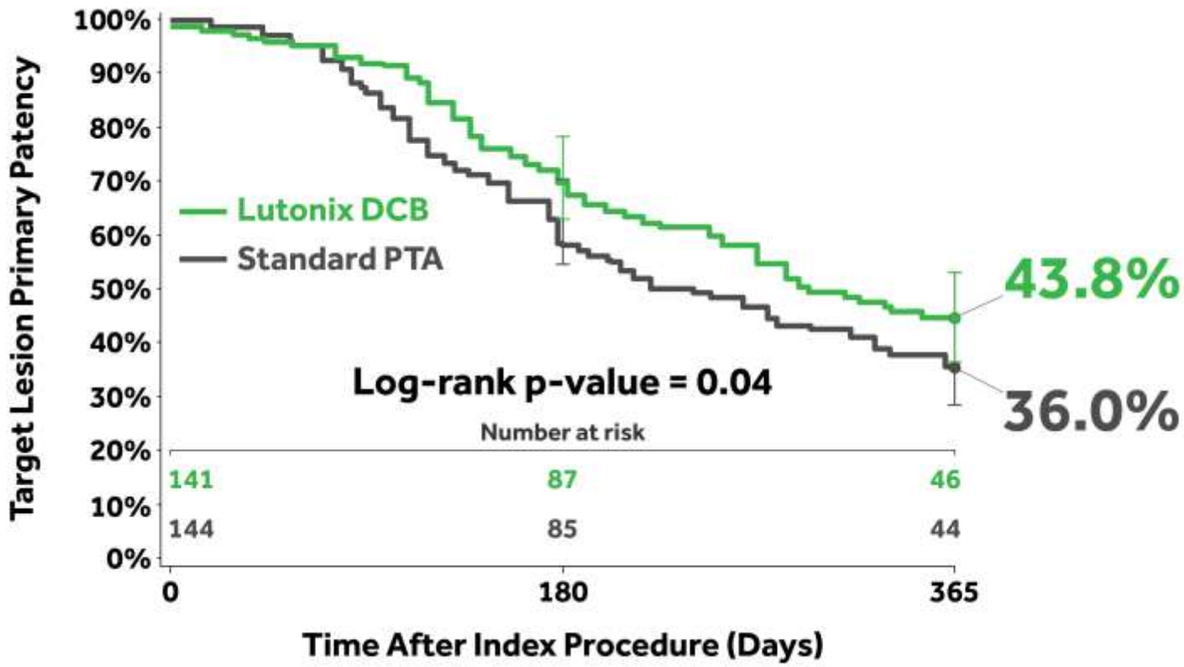
1. Lookstein R, et al. N Engl J Med 2020;383:733-42.
2. Trerotola SO, Lawson J, Roy-Chaudhury P, Saad TF, et al. Drug Coated Balloon Angioplasty in Failing AV Fistulas: A Randomized Controlled Trial. Clin J Am Soc Nephrol 2018;13:1215-1224.
3. LUTONIX® 035 Drug Coated Balloon PTA Catheter Model 9010 - BAW1400000 Rev4 Instructions for Use. Published October 2019.

Target Lesion Primary Patency in Context – 12 Months

IN.PACT AV Access IDE[1]: Multicenter, global, prospective, randomized, core laboratory and clinical events committee adjudicated trial of 330 subjects



Lutonix AV IDE[2]: Multicenter, prospective, randomized, core laboratory and clinical events committee adjudicated trial of 285 subjects

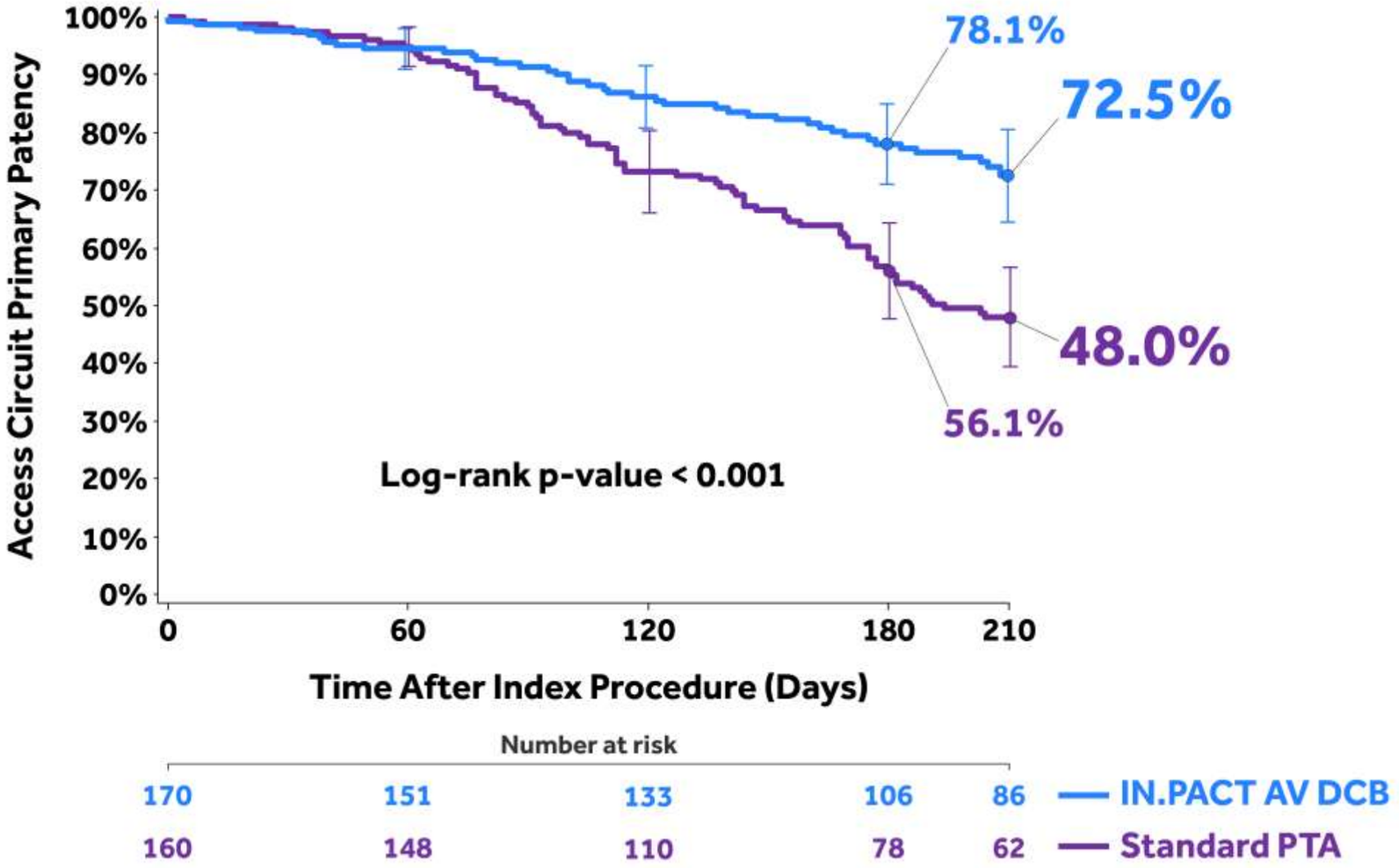


Results are not directly comparable. Primary patency rates may be defined differently. Information provided is for illustration purposes only, and may differ in head-to-head comparison

IN.PACT AV DCB is approved in the United States, Canada, and Japan for treatment, after appropriate vessel preparation, of obstructive lesions up to 100 mm in length in the native arteriovenous dialysis fistulae with reference vessel diameters of 4 to 12 mm

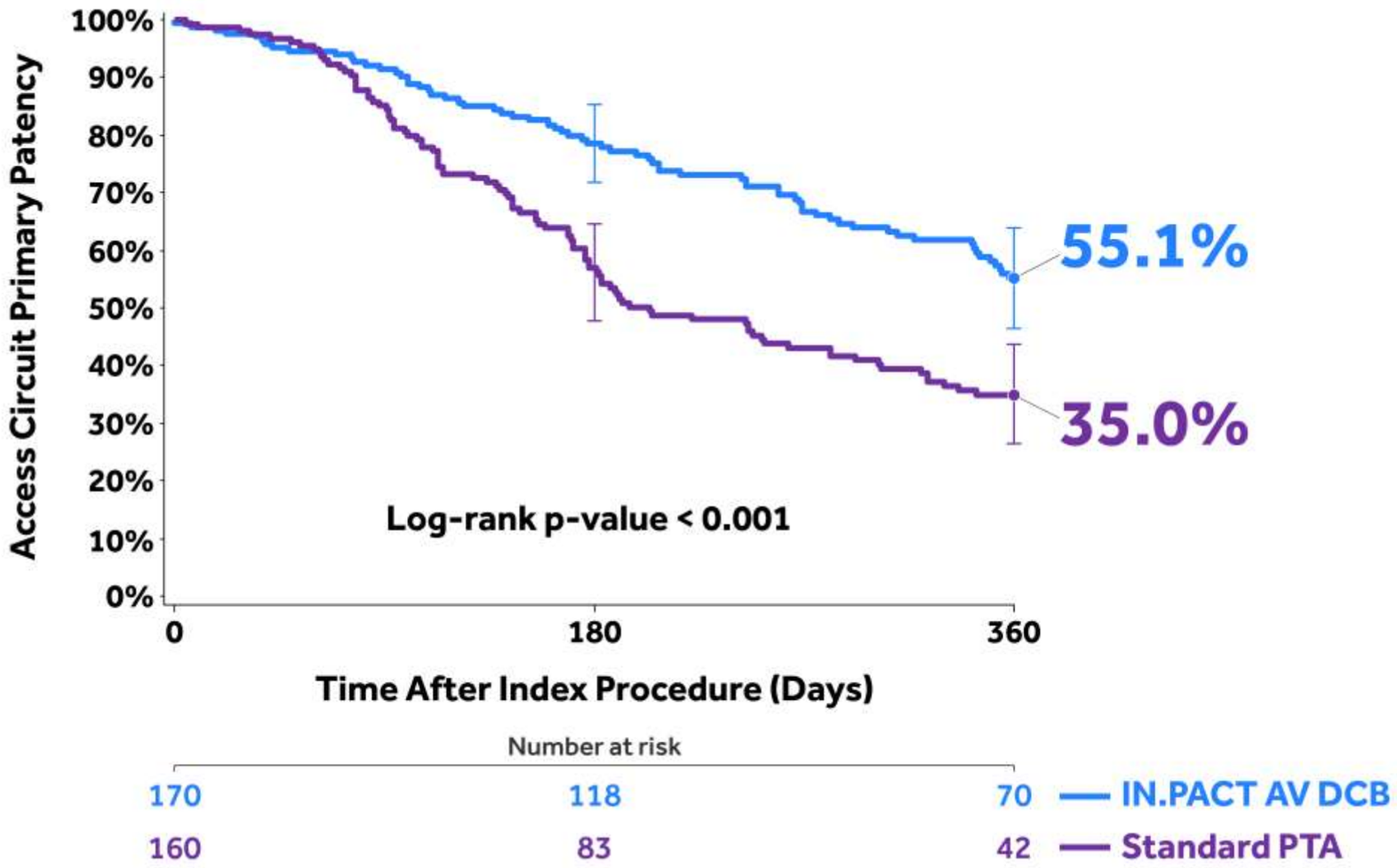
1. Holden, A. LINC 2020.
2. Trerotola SO, Lawson J, Roy-Chaudhury P, Saad TF, et al. Drug Coated Balloon Angioplasty in Failing AV Fistulas: A Randomized Controlled Trial. Clin J Am Soc Nephrol 2018;13:1215-1224.

Access Circuit Primary Patency Through 6 Months



1. Lookstein R, et al. N Engl J Med 2020;383:733-42.

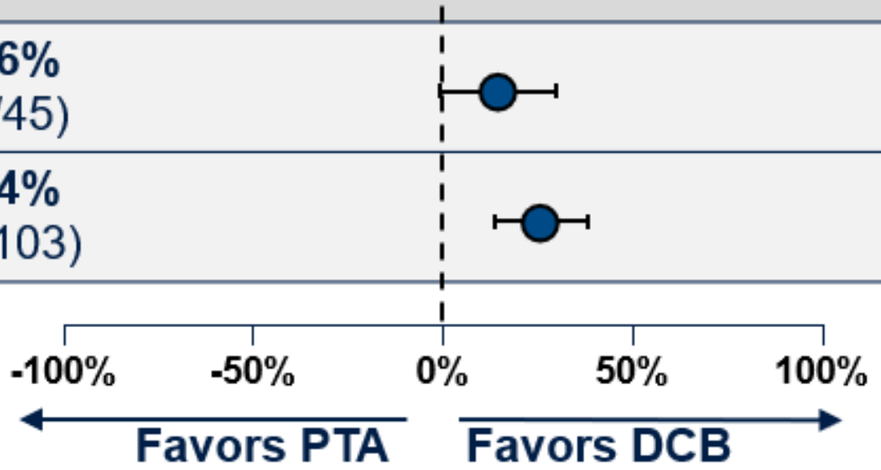
Access Circuit Primary Patency Through 12 Months



Holden A. LINC 2020

Target Lesion Primary Patency Through 6 Months
DCB vs PTA by Lesion Type

Subgroup (N_{DCB}/N_{PTA})	IN.PACT AV DCB	Standard PTA	Difference [95% CI]
Lesion Type			
De Novo (51/49)	**90.7%** (39/43)	**75.6%** (34/45)	**15.1%** [-0.1%, 30.4%]
Restenotic (119/111)	**78.9%** (86/109)	**52.4%** (54/103)	**26.5%** [14.2%, 38.8%]

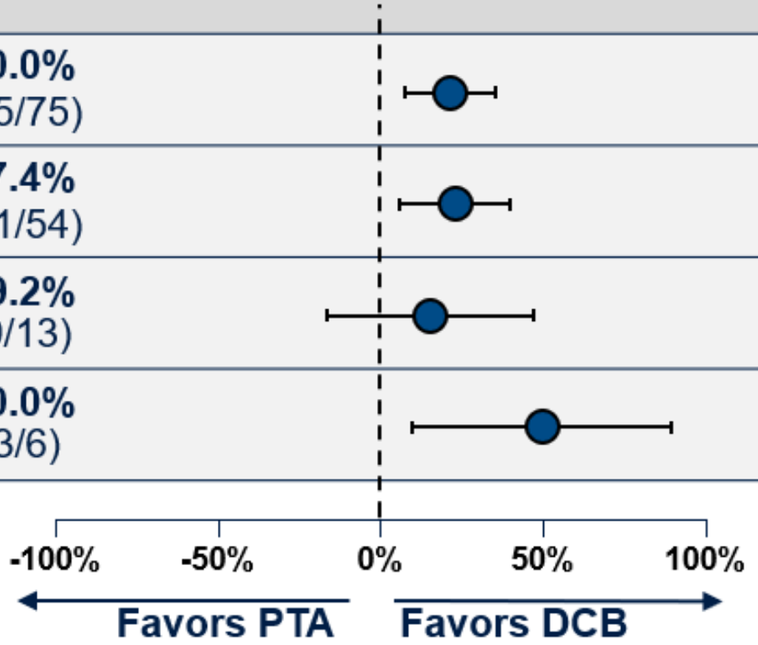


IN.PACT AV DCB is approved in the USA, Canada, and Japan for treatment, after appropriate vessel preparation, of obstructive lesions up to 100 mm in length in the native arteriovenous dialysis fistulae with reference vessel diameters of 4 to 12 mm.

Lookstein, R. VIVA 2020

Target Lesion Primary Patency Through 6 Months
DCB vs PTA by AVF Type

Subgroup (N_{DCB}/N_{PTA})	IN.PACT AV DCB	Standard PTA	Difference [95% CI]
AVF Type			
Radiocephalic (86/80)	**81.7%** (67/82)	**60.0%** (45/75)	**21.7%** [7.8%, 35.6%]
Brachiocephalic (62/58)	**80.8%** (42/52)	**57.4%** (31/54)	**23.4%** [6.4%, 40.4%]
Brachiobasilic (17/15)	**84.6%** (11/13)	**69.2%** (9/13)	**15.4%** [-16.5%, 47.2%]
Other* (5/7)	**100.0%** (5/5)	**50.0%** (3/6)	**50.0%** [10.0%, 90.0%]

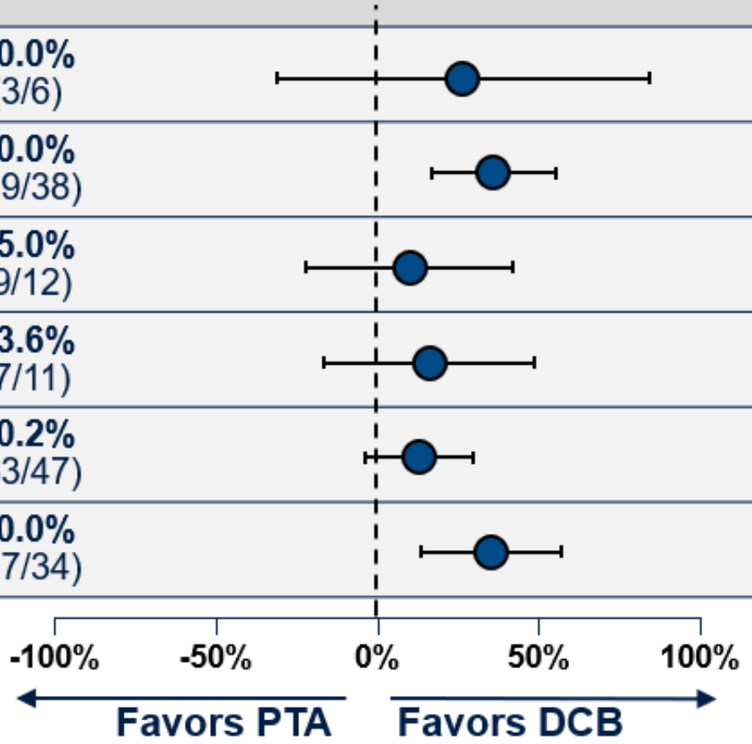


IN.PACT AV DCB is approved in the USA, Canada, and Japan for treatment, after appropriate vessel preparation, of obstructive lesions up to 100 mm in length in the native arteriovenous dialysis fistulae with reference vessel diameters of 4 to 12 mm.

Lookstein, R. VIVA 2020

Target Lesion Primary Patency Through 6 Months
DCB vs PTA by Lesion Location

Subgroup (N_{DCB}/N_{PTA})	IN.PACT AV DCB	Standard PTA	Difference [95% CI]
Target Lesion Location			
Arterial Inflow (4/7)	**75.0%** (3/4)	**50.0%** (3/6)	**25.0%** [-33.3%, 83.3%]
Anastomosis (44/40)	**84.6%** (33/39)	**50.0%** (19/38)	**34.6%** [15.1%, 54.1%]
Swing Point (14/12)	**83.3%** (10/12)	**75.0%** (9/12)	**8.3%** [-24.0%, 40.7%]
In Cannulation Zone (25/12)	**78.3%** (18/23)	**63.6%** (7/11)	**14.6%** [-18.4%, 47.7%]
Venous Outflow (53/53)	**81.6%** (40/49)	**70.2%** (33/47)	**11.4%** [-5.6%, 28.4%]
Cephalic Arch (30/36)	**84.0%** (21/25)	**50.0%** (17/34)	**34.0%** [11.9%, 56.1%]



IN.PACT AV DCB is approved in the USA, Canada, and Japan for treatment, after appropriate vessel preparation, of obstructive lesions up to 100 mm in length in the native arteriovenous dialysis fistulae with reference vessel diameters of 4 to 12 mm.

Lookstein, R. VIVA 2020

Summary of Different AV Treatment Strategies

	Covered Stents						DCB					BMS	
Author	**Kitrou [1]**	**Falk [2]**	**Vesely [3]**	**Dolmatch [4,5]**	**Haskal [6]**	**Yang [7]**	**Katsanos [8,9]**	**Lucev [10]**	**Maleux [11]**	**Trerotola [12, 13]**	**Lookstein [14, 15]**	**Hoffer [16]**	**Shemesh [17]**
Study Device	Covera™* covered stent	Fluency™* Plus stent graft	Viabahn™* endoprothesis	Covera	Flair™* stent graft	N/R	IN.PACT™ Admiral™ DCB	IN.PACT	IN.PACT	Lutonix™* 035	IN.PACT AV	Wallstent™* endoprothesis	Luminex™* BMS Fluency Plus
Design	Retrospective single center	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT	Prospective RCT
# Patients	64	275	293 (Graft:145, PTA:148)	280 (Graft:142, PTA:138)	190	98	40	62	64	285 (DCB:141, PTA:144)	330 (DCB:170, PTA:160)	34	25
Access Type	AVG	AVG/AVF (ISR)	AVG	AVF	AVG	AVG	AVF (14) and AVG (26)	AVF	AVF	AVF	AVF	AVG	
Endpoint	**Primary Patency**	**Access Circuit Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**	**Primary Patency**
6-mo Results	73.60%	Graft: 18.6%	Graft: 51.6%	Graft: 78.7%	Graft: 51%	Graft: 83.2%	DCB: 70%	DCB:90.3%	DCB: 67%	DCB: 71.4%	DCB: 81.4%	Stent: 128 day	Graft: 82%
		PTA: 4.5% p<.001	PTA: 34.2% p=.006	PTA: 47.9% p<.001	PTA: 23% p<.001	PTA: 27.8%	PTA: 25% p<0.001	PTA:61.3%;p= 0.016	PTA: 65%;p=.76	PTA: 63% p=0.057	PTA: 59.0% p<0.001	PTA: 128 day	BMS: 39%
12-mo Results				Graft: 57.5%		Graft: 46.9%	DCB: 35%			DCB: 45%	DCB: 65.3%		Graft: 39%
				PTA: 21.2% p<.001		PTA: 7.8%	PTA: 5% p<0.001			PTA: 35% p= 0.045	PTA: 46.3% p<0.001		BMS: 0, p=0.0023
24-mo Results				Graft: 41.8%						DCB: 26.9%			
				PTA: 10.4% p<.001						PTA:24.4% p=0.087			

Results are not directly comparable. Primary patency rates may be defined differently. Information provided is for illustration purposes only, and may differ in head-to-head comparison

IN.PACT AV DCB is approved in the USA, Japan, and Canada for treatment, after appropriate vessel preparation, of obstructive lesions up to 100 mm in length in the native arteriovenous dialysis fistulae with reference vessel diameters of 4 to 12 mm.

IN.PACT Admiral DCB is approved for treatment of obstructive lesions of arteriovenous dialysis fistulae in the European Union. Please consult the approved product labeling and indications for use for your region or country as indicated within the respective product manual.

1. Kitrou PM, et al. J Vasc Interv Radiol 2020;31:630-4.
2. Falk A, et al. J Vasc Interv Radiol 2016;27:1465-76.
3. Vesely T, et al. J Vasc Surg 2016;64:1400-10 e1.
4. Dolmatch B. LINC 2020; Leipzig, Germany.
5. Dolmatch B. CIRSE; 2020; Virtual.
6. Haskal ZJ, et al. N Engl J Med 2010;362:494-503.
7. Yang HT, et al. J Vasc Surg 2018;68:546-53.
8. Katsanos K, et al. J Endovasc Ther 2012;19:263-72.
9. Kitrou PM, et al. Eur J Radiol 2015;84:418-23.
10. Lucev J, et al. CVasc Intervent Radiol 2018;41:882-9.
11. Maleux G, et al. J Vasc Interv Radiol 2018;29:470-5 e3.
12. Trerotola SO, et al. Clin J Am Soc Nephrol 2018;13:1215-24.
13. Trerotola SO,et al. J Vasc Interv Radiol 2020;31:1-14 e5.
14. Lookstein R, et al. N Engl J Med 2020;383:733-42.
15. Holden A LINC 2020; Leipzig, Germany.
16. Hoffer EK, et al. J Vasc Interv Radiol 1997;8:965-73.
17. Shemesh D, et al. J Vasc Surg 2008;48:1524-31, 31 e1-2.