

DEB for Femoropopliteal Lesions: Latest Trial Results

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Potential conflicts of interest

Speaker's name: **Massimiliano Fusaro**

I have the following potential conflicts of interest to report:

- Research contracts
- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

X I do not have any potential conflict of interest

ESC Guidelines on the diagnosis and treatment of peripheral artery diseases

failure. Currently there is no established method—besides stent implantation—to improve at least the mid-term patency of angioplasty. The use of drug-eluting balloons seems promising; however, the current limited data do not justify a general recommendation.

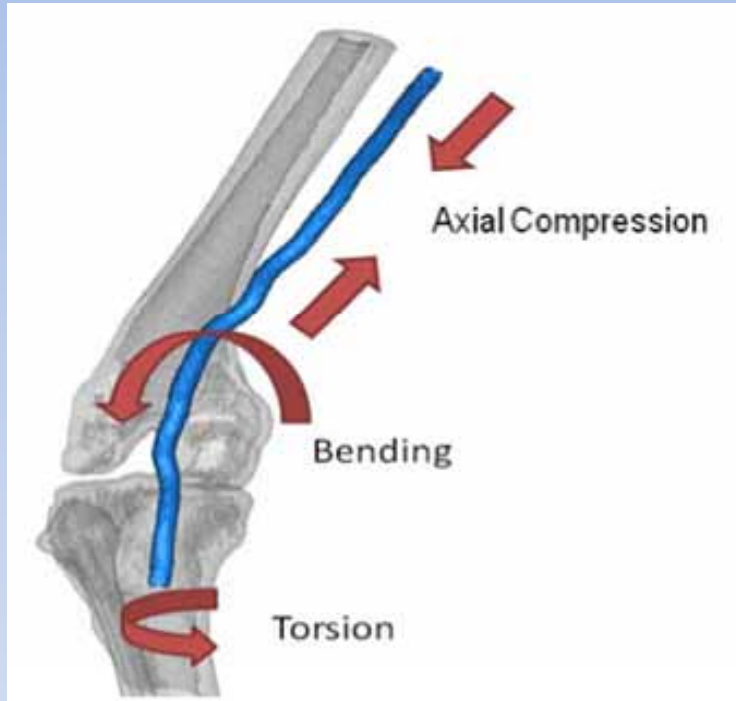
Eur Heart J 2011;32, 2851–2906

Management of Patients With Peripheral Artery Disease (Compilation of 2005 and 2011 ACCF/AHA Guideline Recommendations)

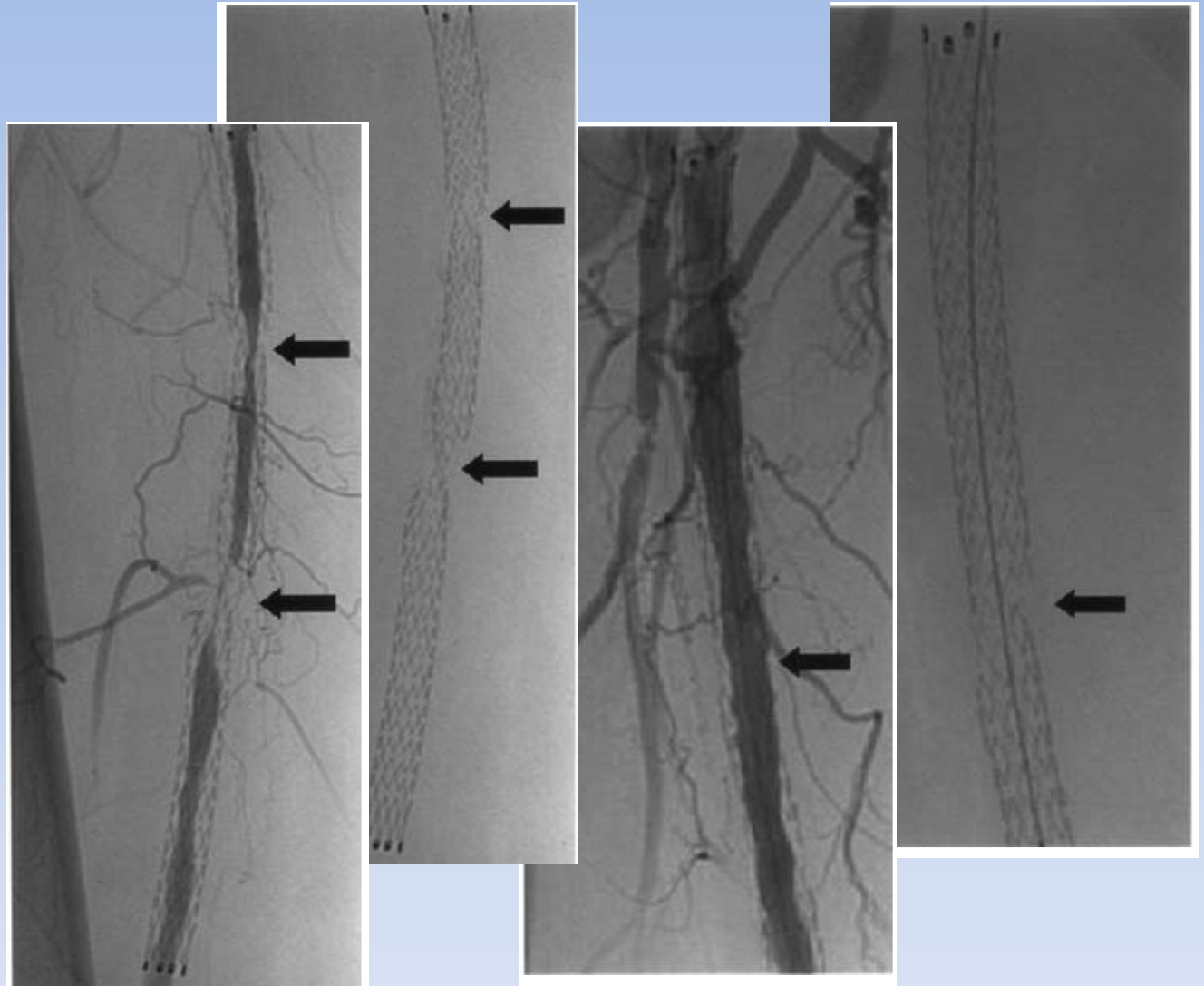
CLASS IIb

- 1. The effectiveness of stents, atherectomy, cutting balloons, thermal devices, and lasers for the treatment of femoral-popliteal arterial lesions (except to salvage a suboptimal result from balloon dilation) is not well-established. (*Level of Evidence: A*)**

Why DEB for femoropopliteal lesions?



Biomechanical forces challenging femoropopliteal artery territory



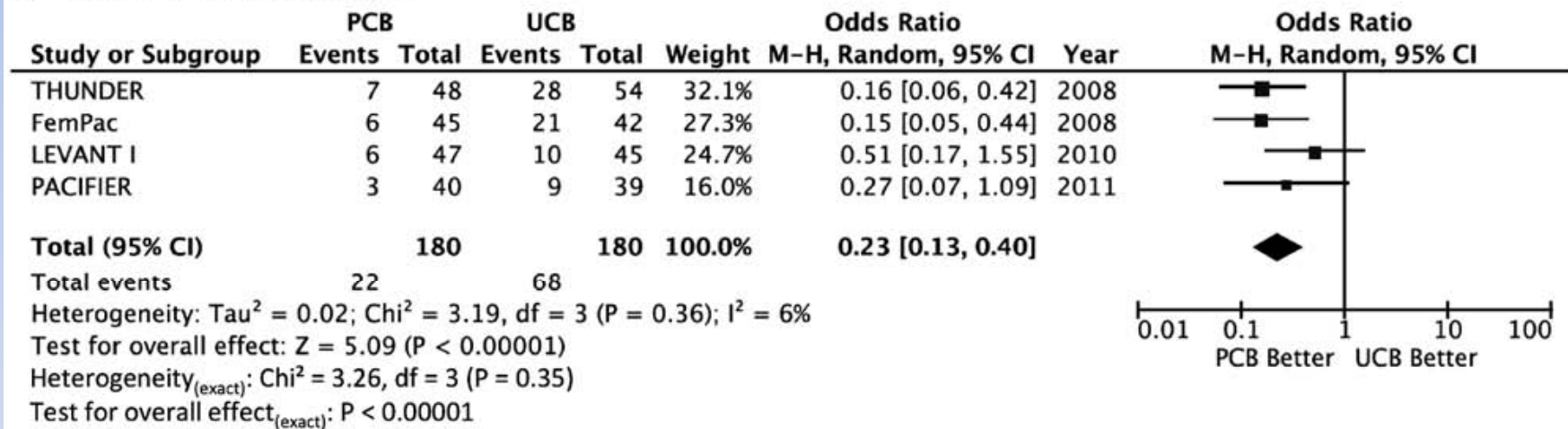
Scheinert D, J Am Coll Cardiol 2005;45:312-5

1. DEB vs PTA for femoropopliteal lesions

Paclitaxel-Coated Versus Uncoated Balloon Angioplasty Reduces Target Lesion Revascularization in Patients With Femoropopliteal Arterial Disease

A Meta-Analysis of Randomized Trials

A Target lesion revascularization



In femoropopliteal arterial disease, PCB therapy is associated with superior antirestenotic efficacy as compared with UCB angioplasty with no evidence of a differential safety profile **after a median follow-up of 10.3 months**

Absolute risk reduction = 25.5% [17.0%, 34.1%]

Number needed to treat = 4 [2.9–5.9]

DEB for femoropopliteal lesions: long-term FU

2-Year Results of Paclitaxel-Eluting Balloons for Femoropopliteal Artery Disease

Evidence From a Multicenter Registry

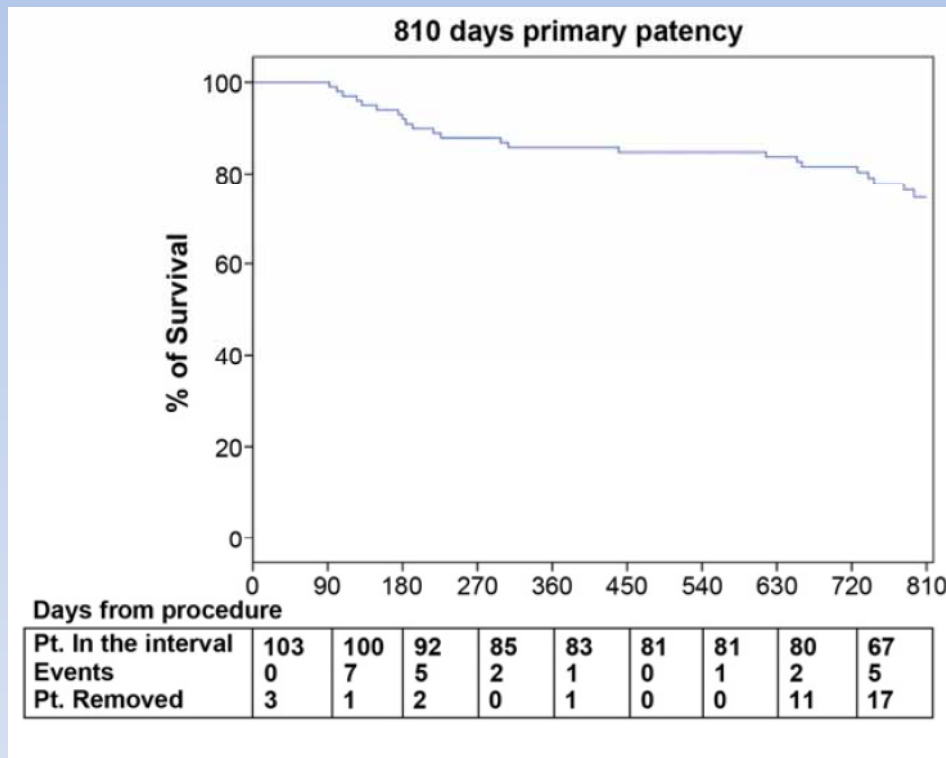


Figure 1. Two-Year Primary Patency

Kaplan-Meier curve representing freedom from target lesion revascularization or restenosis >50% (primary patency) at 2 years.

105 patients

72.4% primary patency at 2-year FU

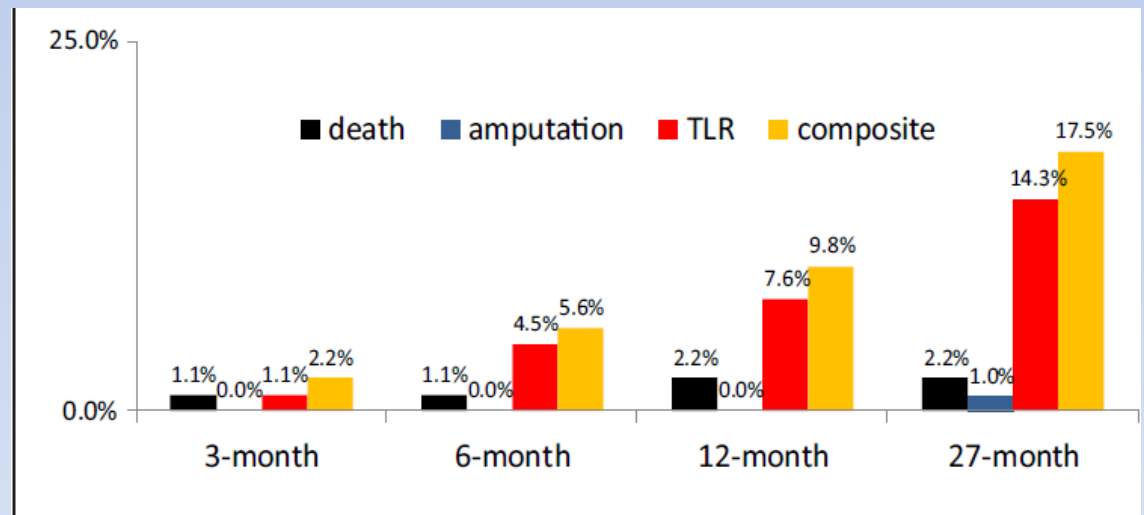


Figure 7. Major Adverse Events

Death, amputation, target lesion revascularization (TLR), and composite event rates at different follow-up time points (27 ± 3 months).

DEB for femoropopliteal **in-stent restenosis**

Table 1. Main Features of Included Trials

Trial	THUNDER ⁶	FemPac ⁷	LEVANT I ⁸	PACIFIER ⁹
Year	2004–2005	2004–2006	2009	2010–2011
Multicentre	Yes	Yes	Yes	Yes
Patients, no.	154	87	101	91
Age, y*	68.5	68.5	68.5	71
Restenotic lesion, %*	33.5	34.5	11.5	24.5
Diabetes mellitus, %*	48	47.5	47.5	35.5
Provisional stenting PCB/UCB, %	4/22†	9/14	N/A	21/34

Cassese S, Fusaro M, et al. Circ Cardiovasc Interv. 2012;5:582-589

How should I treat a restenosis after superficial femoral artery stenting?

Table 1. On-going registered trials of strategies for in-stent restenosis in superficial femoral artery.

Study acronym or institution	Sample size	Comparison	Design	Primary endpoint	Primary completion date	Identifier
ISAR-PEBIS	70	Admiral Xtreme* vs. IN.PACT Admiral*	RCT	6-month DS (angiography)	2012	NCT01083394
FAIR	118	Admiral Xtreme* vs. IN.PACT Admiral*	RCT	6-month recurrent restenosis (DUS)	2012	NCT01305070
DEBATE-ISR	70	NR	RCT	12-month binary restenosis (angiography)	2012	NCT01558531
PACUBA I	60	Freeway [†] vs. standard balloon	RCT	6-month patency (DUS-CTA)	2012	NCT01247402
PLAISIR	100	NR	Observational	12-month TLR	2012	NCT01587482
University Health Network	30	IN.PACT Admiral*	Observational	6-month patency (DUS)	2015	NCT01616888

RCT: randomised controlled trial; DUS: Doppler ultrasonography; CTA: computed tomography angiography; TLR: target lesion revascularisation; NR: not reported. * Medtronic Inc., Frauenfeld, Switzerland; †Eurocor GmbH, Bonn, Germany. Trial acronyms: ISAR-PEBIS: Randomized Trial of Paclitaxel Eluting Balloon or Conventional Balloon for Treatment of In-Stent Restenosis of the Superficial Femoral Artery in Patients With Symptomatic Peripheral Artery Disease; FAIR: Femoral Artery In-Stent Restenosis; DEBATE-ISR: Drug Eluting Balloon in peripheral intervention for In-Stent Restenosis; PACUBA I: Paclitaxel drug-eluting balloon Versus Standard Percutaneous Transluminal Angioplasty to Reduce Restenosis in Patients With In-stent Stenoses in the Superficial Femoral and Proximal Popliteal Artery; PLAISIR: Paclitaxel-Eluting Balloon Application In SFA In Stent Restenosis

Drug-Eluting Balloon for Treatment of Superficial Femoral Artery In-Stent Restenosis

Table 1 Patient Clinical Characteristics

Male	32 (82.1)
Age (yrs)	65.9 ± 9.6
Diabetes (%)	19 (48.7)
Hypertension (%)	36 (93.4)
Hypercholesterolemia	34 (87.2)
Smoking history	34 (87.2)
eGFR <30 (ml/min)	8 (20.5)
Rutherford class	2.9 ± 0.7
BTK patent vessels	
≥2	31 (79.5)
1	8 (20.5)

N = 39. Values are n (%) or mean ± SD.

BTK = below-the-knee; eGFR = estimated glomerular filtration rate

Table 2 Procedural Characteristics

DEB diameter, mm	6 (5-6)
Number of DEB	2 (1-2)
Cumulative DEB length, mm	160 (120-250)
Fractured stents	4 (10.3)
Bailout stenting (%)	4 (10.3)
Procedural success	39 (100)

N = 39. Values are n (%), mean ± SD, or median (interquartile range).

DEB = drug-eluting balloon(s); IQR = interquartile range.

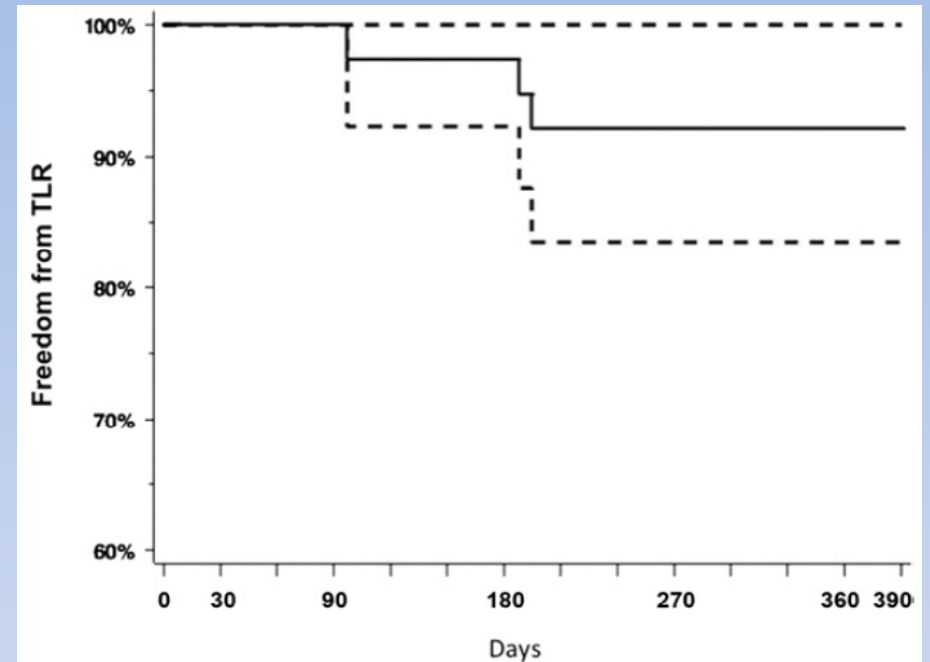


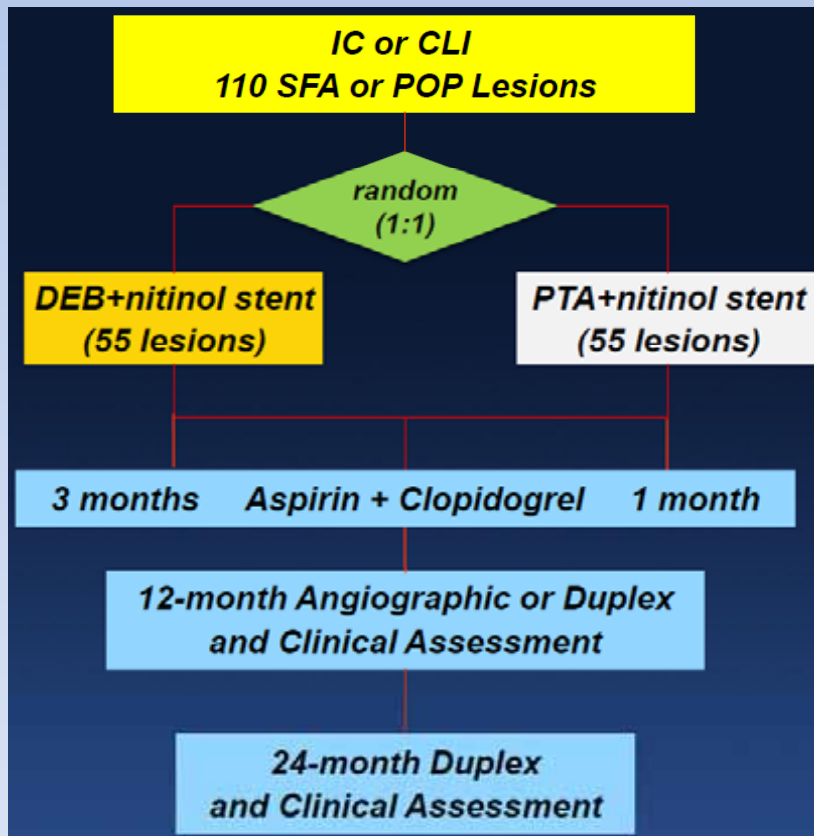
Figure 1 Kaplan-Meier Curve Representing Freedom From TLR

Curve shows freedom from target lesion revascularization (TLR) up to 1 year after drug-eluting balloon-mediated percutaneous transluminal angioplasty of superficial femoral artery in-stent restenosis. **Dotted lines** = 95% confidence interval.

The adjunctive use of DEB for the treatment of SFA-ISR represents a potentially safe and effective therapeutic strategy.

2. DEB + BNS vs PTA + BNS for femoropopliteal lesions

Drug-Eluting Balloon Angioplasty Evaluation in Superficial Femoral and popliteal Artery stenting: the DEBATE-SFA Study



12-month Clinical Outcome (per-patient analysis)

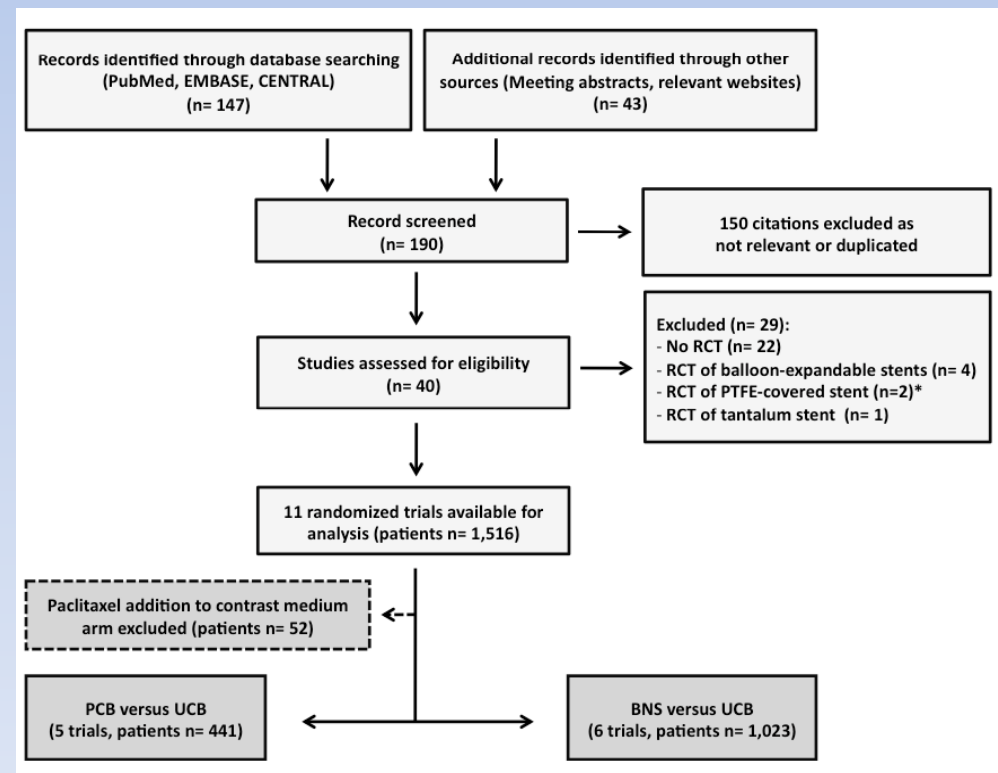
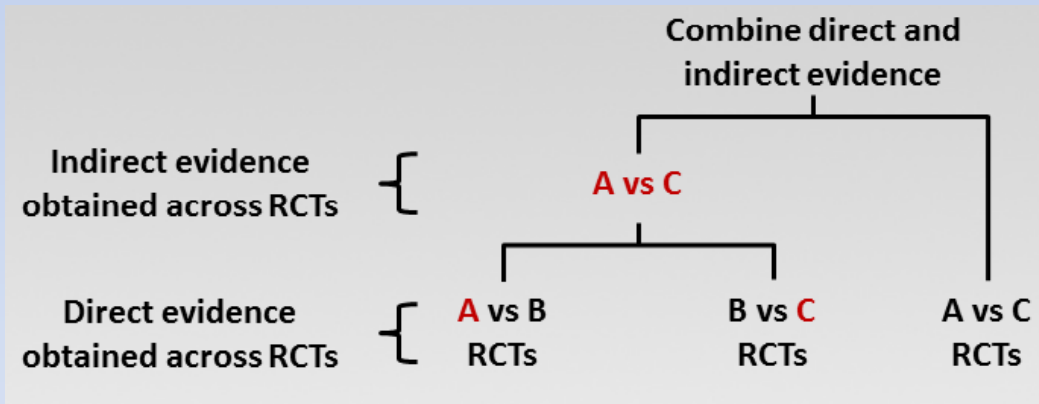
	DEB	PTA	p
Nr. Patients	53	51	
Death	2 (3.8%)	1 (2.0%)	0.9
AMI	1 (1.9%)	0 (0.0%)	0.9
Stroke	1 (1.9%)	1 (2.0%)	0.9
TLR	9 (17.0%)	18 (35.3%)	0.04
Major Amputation	0 (0.0%)	0 (0.0%)	-
Cumulative MAE	13 (24.5%)	18 (35.3%)	0.3

Pre-dilatation with DEB prior to Nitinol Stent reduces restenosis and TLR at 12-month vs. PTA + Stent

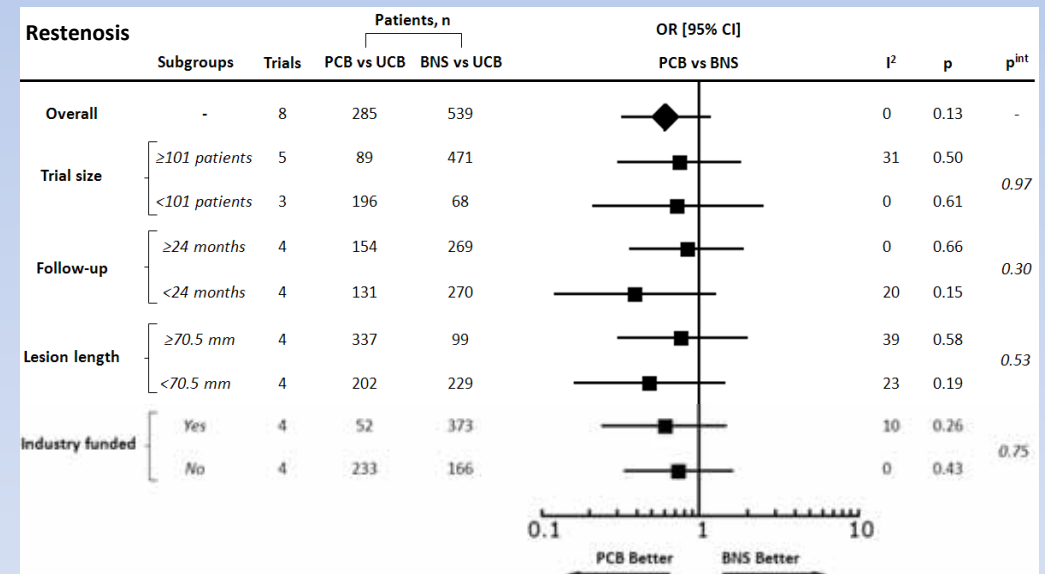
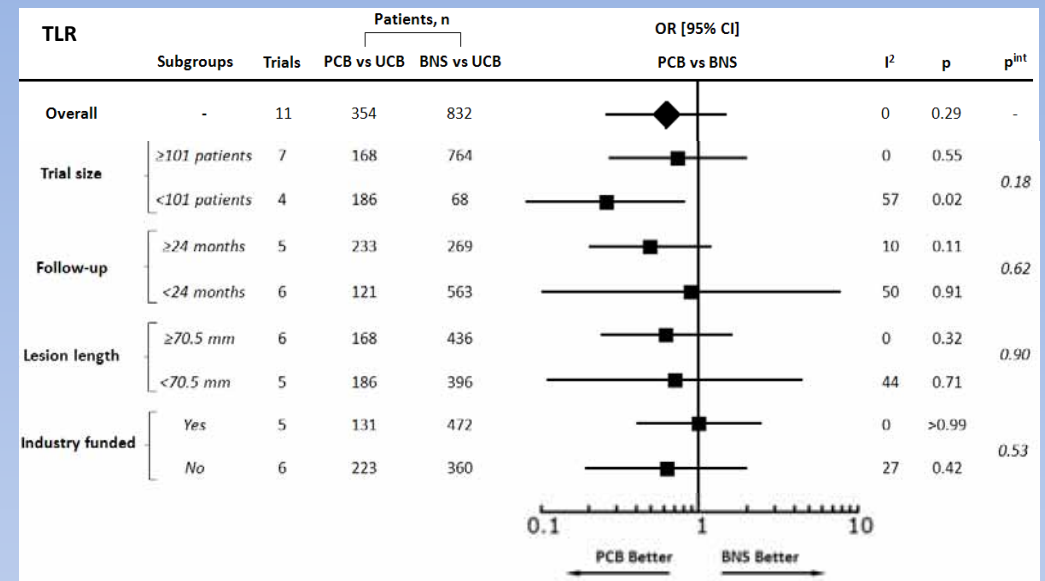
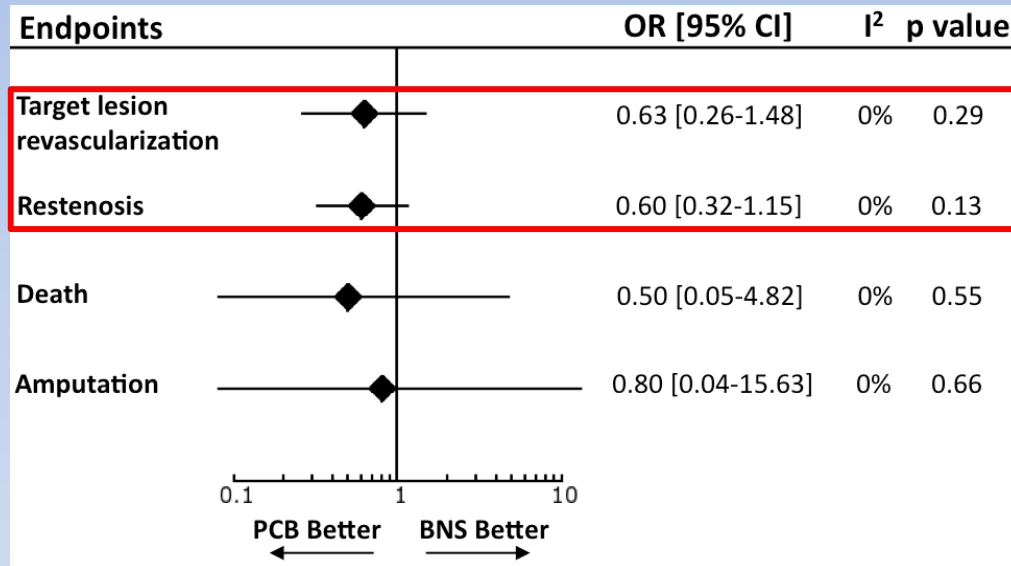
3. DEB vs BNS for femoropopliteal lesions

The performance of paclitaxel-coated balloon (PCB) or primary bare nitinol stent (BNS) versus uncoated balloon angioplasty (UCB) for femoropopliteal artery disease and the relative efficacy and safety of PCB versus BNS are still debated. **No direct comparison is still available**

Paclitaxel-coated balloon or primary bare nitinol stent for revascularization of femoropopliteal artery: a meta-analysis of randomized trials versus uncoated balloon and an adjusted indirect comparison



Median follow-up was 24 months [IQR 12-24] in the PCB subgroup and 12 months [IQR 12-24] in the BNS subgroup



At indirect comparison, paclitaxel-coated balloon may have comparable antirestenotic efficacy and safety of bare nitinol stent, **though the advantage of “leaving nothing behind”**

4. DEB for femoropopliteal lesions: the next future*

Vs	PTA	DEB	Stent	Ath
PTA		-	-	-
DEB	INPACT SFA I; Tepe G - NCT01175850		-	ADCAT; Zeller, T - NCT01763476
	INPACT SFA II; Medtronic - NCT01566461			ISAR-STATH; Fusaro M - NCT00986752
	COPA CABANA; Tepe G - NCT01594684			DEFINITIVE AR; Zeller T - NCT01366482
	Advance® 18 PTX; Scheinert D - NCT00776906			
	LEVANT 2; Scheinert D - NCT01412541			
	LEVANT Japan; Iida O - NCT01816412			
Stent	-	REAL PTX; Peeters P - NCT01728441		-
Ath	-	-	-	

* randomized trials only

Conclusions

Yet in the “stent era”, the main limitation of endovascular treatment modalities in the femoropopliteal tract is the high rate of recurrent lesions necessitating reinterventions

DEB may offer enhanced antirestenotic efficacy versus plain angioplasty, without safety concerns

DEB maybe used as a successful and reproducible strategy for patients presenting with in-stent restenosis of femoropopliteal arteries, with definitive, large-scale data still awaited

The supposed comparable efficacy of DEB versus bare nitinol as well as drug-eluting stenting awaits properly-designed, randomized controlled trials

Whether guidelines writing-authorities should encourage replacing uncoated balloon angioplasty with DEB remains a matter of great debate