

# DEB in Periphery: What we Know Till Now

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**SANKT GERTRAUDEN  
KRANKENHAUS** 



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# Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

## Affiliation/Financial Relationship

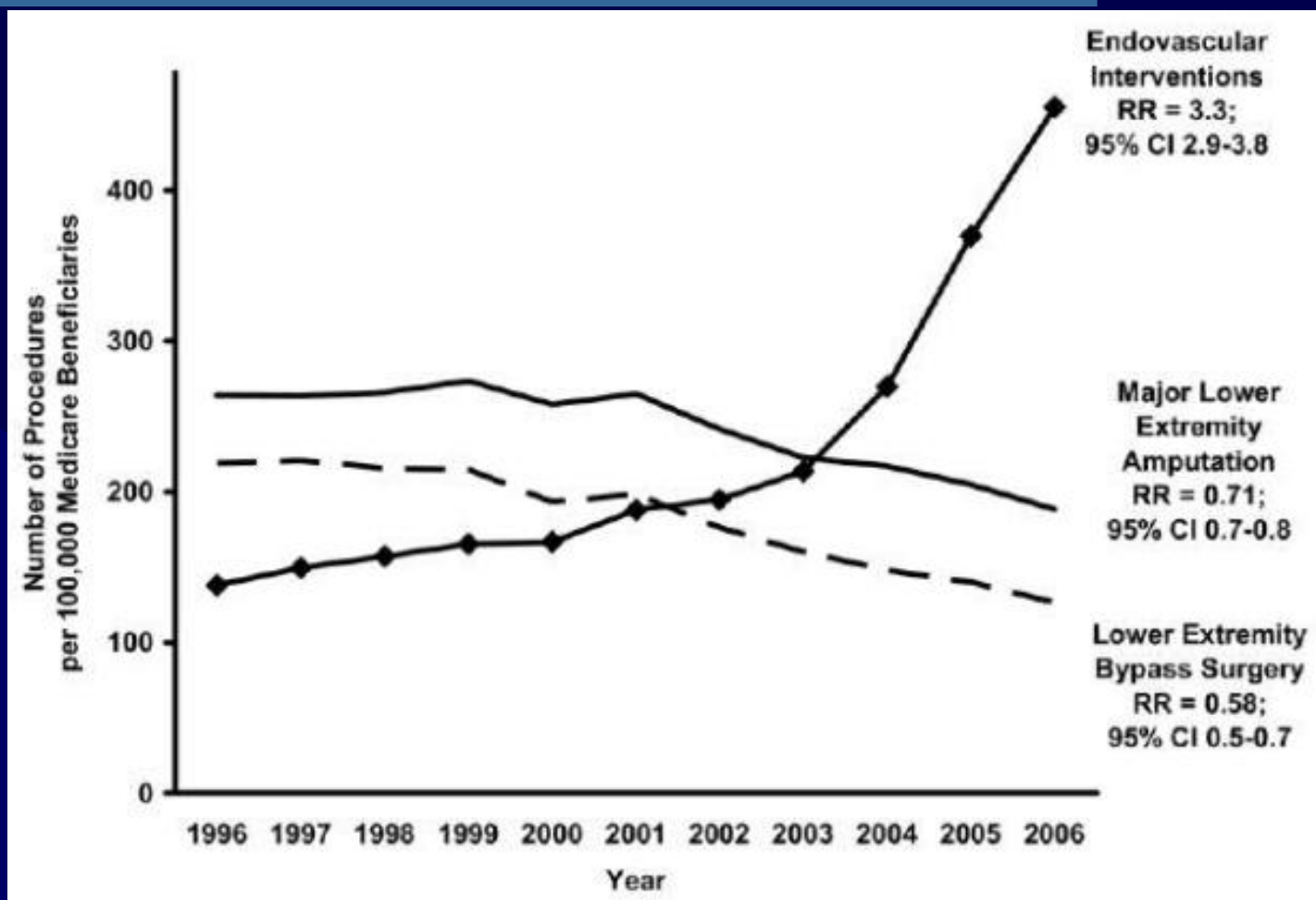
- Member Advisory Board
- Grant/Research Support
- Consulting Fees/Honoraria

## Company

- Bayer, Eurocor, Terumo
- Biotronik, Roche
- AstraZeneca, Bard , Boston Scientific, EV3, Sanofi

# Endovascular Intervention, Bypass Surgery and Major Amputation Rates in the U.S. (1996-2006)

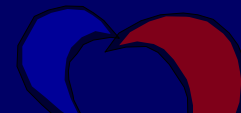
Trends in endovascular interventions, major amputations, and lower extremity bypass surgery, 1996-2006, R.R., Risk ratio; CI, confidence interval



# Problems with SFA Stenting



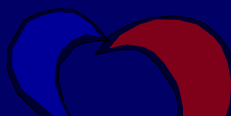
Restenosis



# Results of Balloon Angioplasty

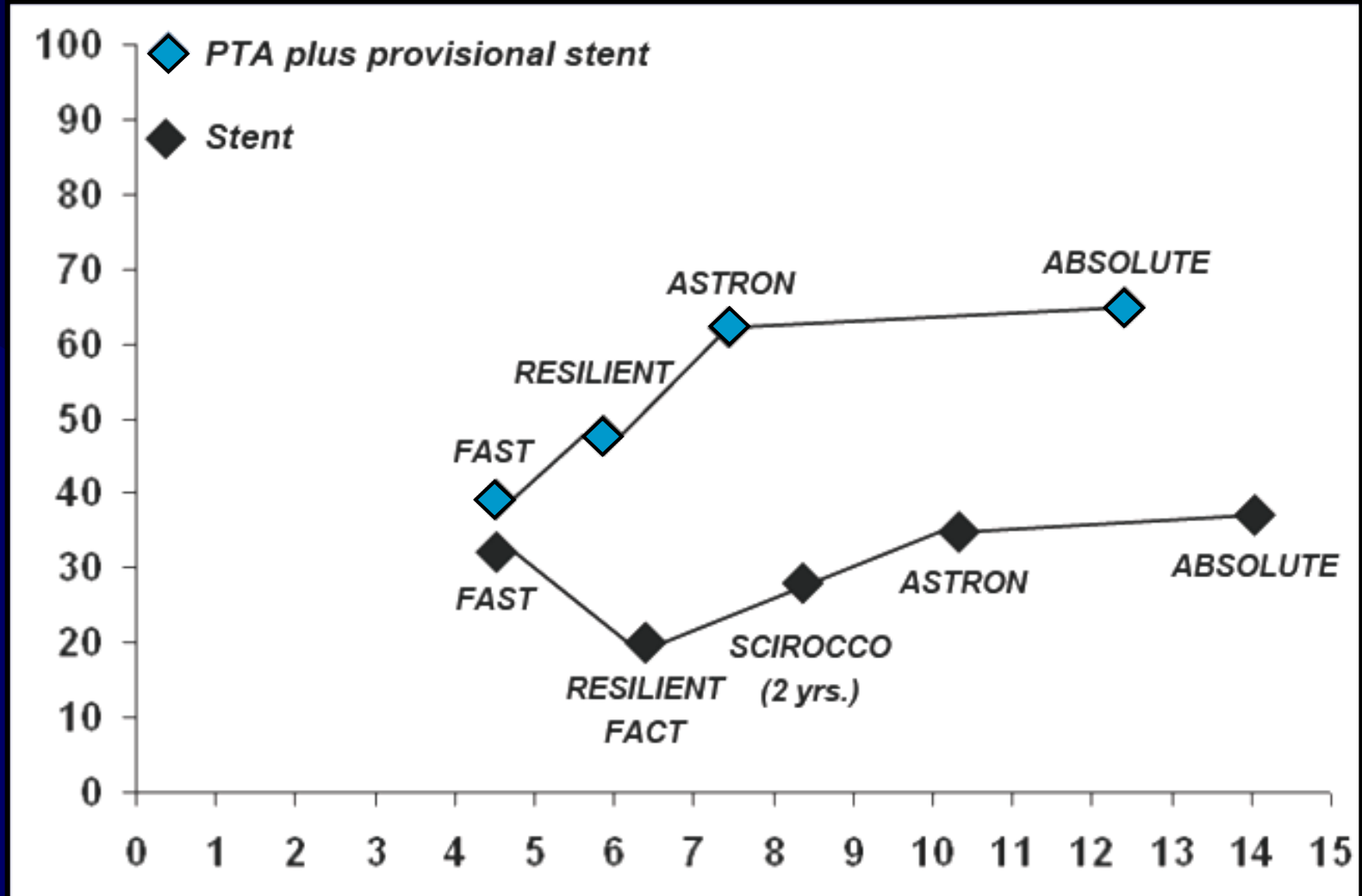
	<b>Patients (n)</b>	<b>Lesion Length</b>	<b>F/U</b>	<b>Primary Patency</b>
Matsi PJ et al., 1995	107	7.2 cm	2 years	<b>51 %</b>
Stanley B et al., 1996	176	> 10 cm	2 years	<b>46 %</b>
Krankenbergh H et al., 2002	58	22 cm	1 year	<b>44 %</b>
Jämsén TS et al., 2002	173	5.2 cm	1 year	<b>46 %</b>

**Weighted average: 47 %**

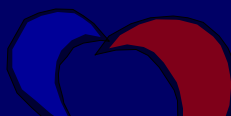


# 12 Months Restenosis vs. Lesion Length: Data from Controlled Trials

Binary Restenosis @ 12 Months (%)

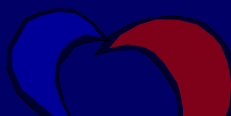


Length of the Lesion (cm)



# Improvement of Patency in SFA

- Drugs
- Subintimal Angioplasty
- Bare Stent
- Covered Stent
- Drug Eluting Stent
- **Drug Eluting Balloon**
- Bioabsorbable Stent
- Brachytherapy
- Cryoplasty
- Cutting Balloon
- Photodynamic Therapy
- Debulking



# THUNDER Trial

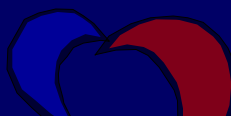
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

## Local Delivery of Paclitaxel to Inhibit Restenosis during Angioplasty of the Leg

Gunnar Tepe, M.D., Thomas Zeller, M.D., Thomas Albrecht, M.D.,  
Stephan Heller, M.D., Uwe Schwarzwälder, M.D., Jean-Paul Beregi, M.D.,  
Claus D. Claussen, M.D., Anja Oldenburg, M.D., Bruno Scheller, M.D.,  
and Ulrich Speck, Ph.D.

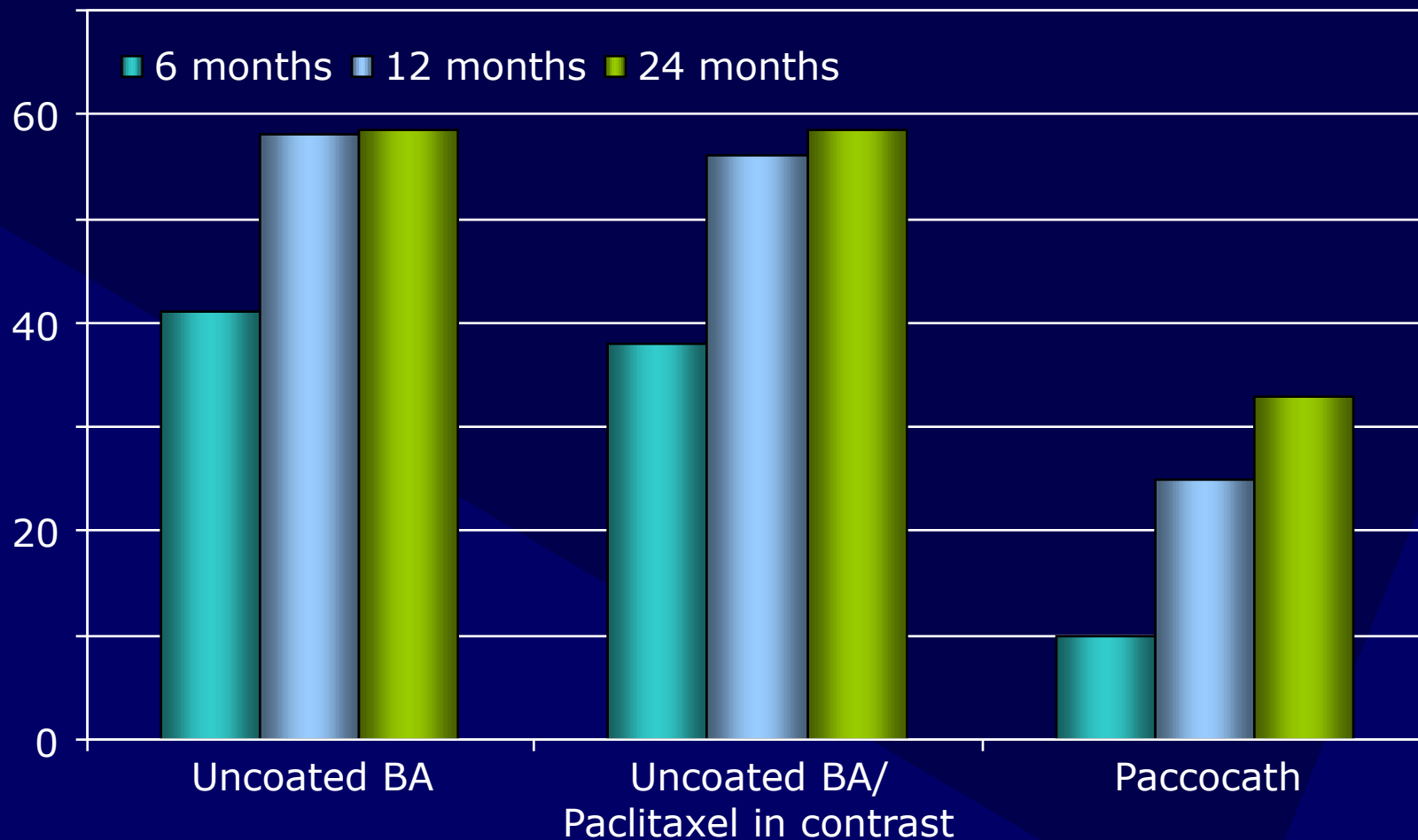
Tepe et al., NEJM 2008; 358:689-699



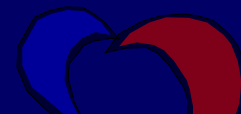
# DEB Clinical Trials: Femoral-Popliteal

## THUNDER

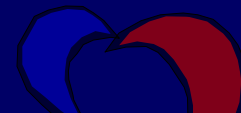
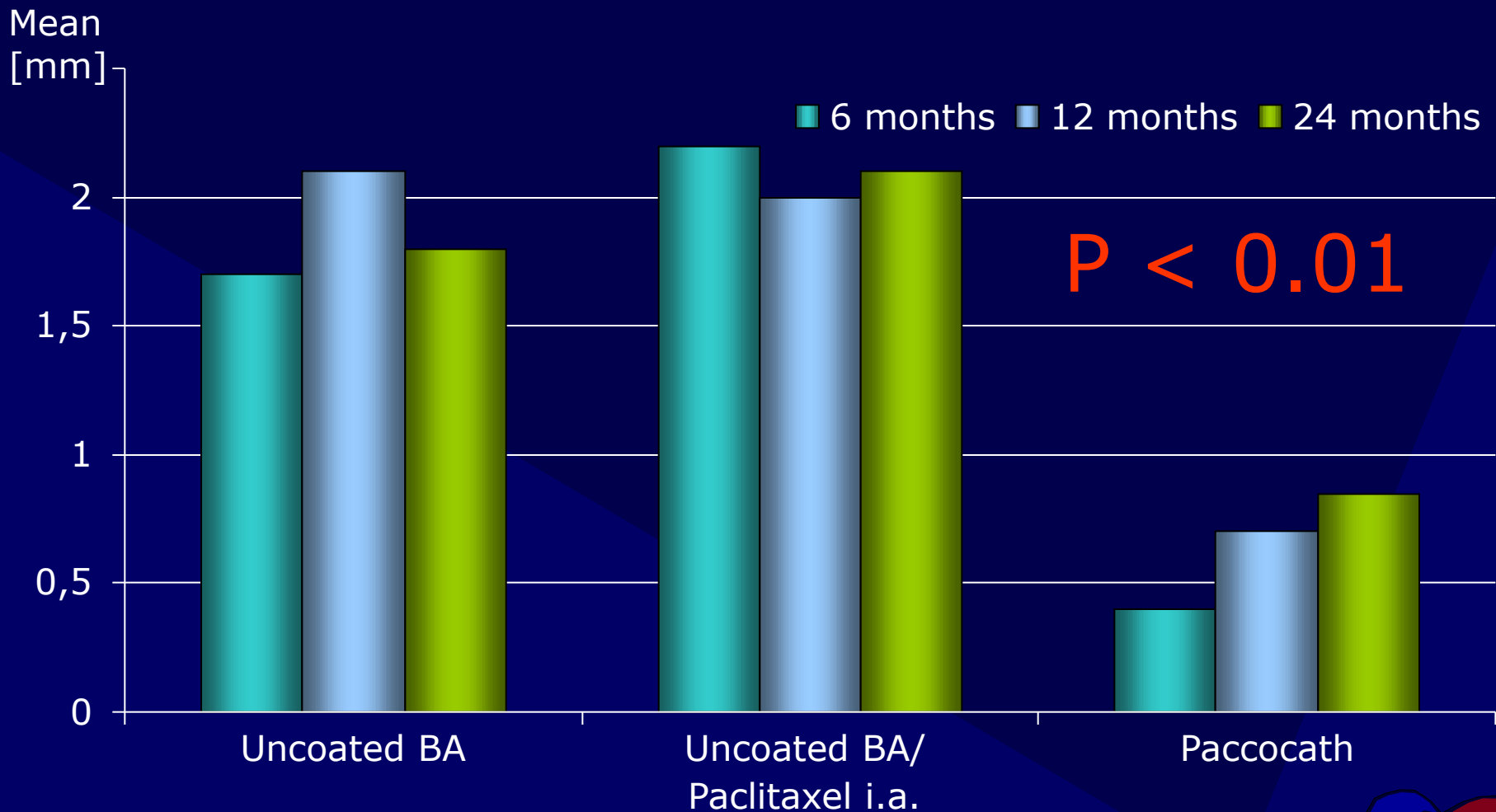
### Long-Term Follow-Up



Binary Restenosis Rate

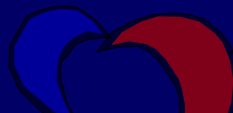


# Late Lumen Loss at 6, 12 or 24 Months or Before 1st TLR (Primary Endpoint)



# Restenosis rates (%) PTA vs. Stent (Duplex)

Studie	Lesion (cm)	PTA	Stent	P<
ABSOLUTE	ca. 10	63 (33/52)	37 (18/49)	0.01
FAST	ca. 4.5	35 (29/82)	32 (31/97)	n.s.
		<b>PTA</b>	<b>DEB</b>	
THUNDER	ca. 7.5	49 (18/37)	21 (7/34)	0.01



# Ongoing SFA Studies

## → Levant I (German) (101 pts) 2011

- Lutonix DEB vs. POBA
- SFA 4-15 cm, angio @ 6 mo., **6 mo completed**, 24 month F/up

## → Advance 18 PTX (German & Russian) (150 pts) 2011

- PEB vs. POBA
- Denovo or ISR, angio @ 6 mo., lesions up to 19 cm, 24 mo. F/up

## → ISAR-STATH (German) (150 pts) 2012

- PEB or POBA or atherectomy followed by stenting (150 pts)
- Rutherford 2-6 with > 70 % SFA stenosis, 24 mo. F/up

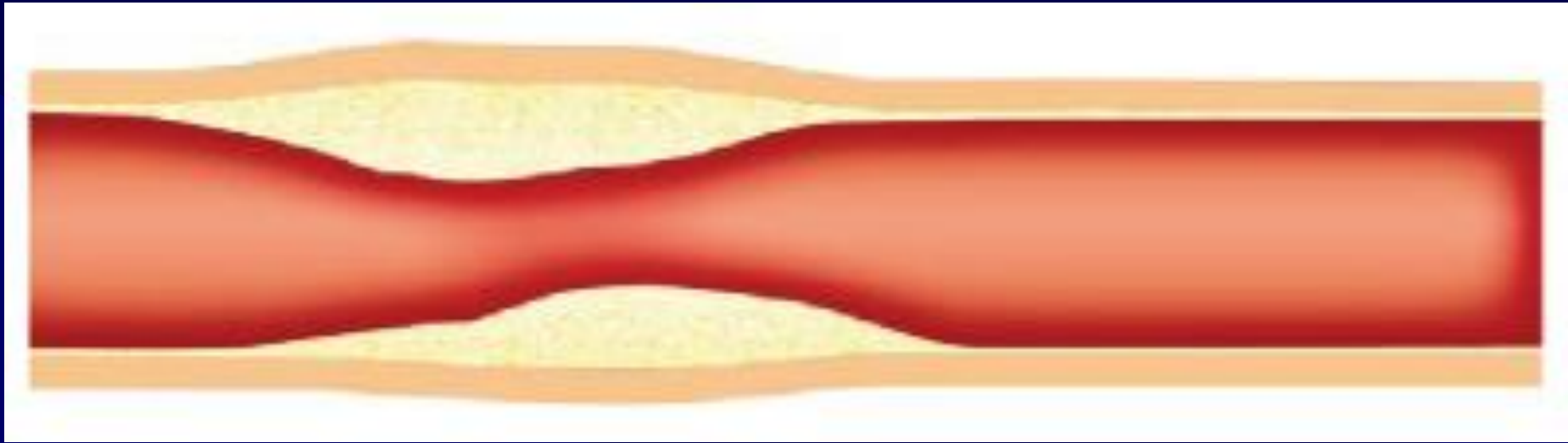
## → ISAR-PEBIS (German) (70 pts) 2013

- SFA-ISR treated with PEB or POBA
- Rutherford 2-6 with > 70 % SFA stenosis, 24 mo. F/up

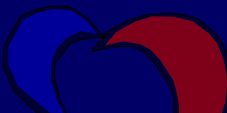


# First Experiences

**FREEWAY® 014, infrapopliteal PTA balloon 0.014" OTW**



**FREEWAY® 035, femoropopliteal PTA balloon 0.035" OTW**

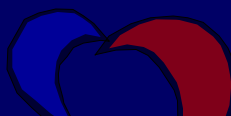
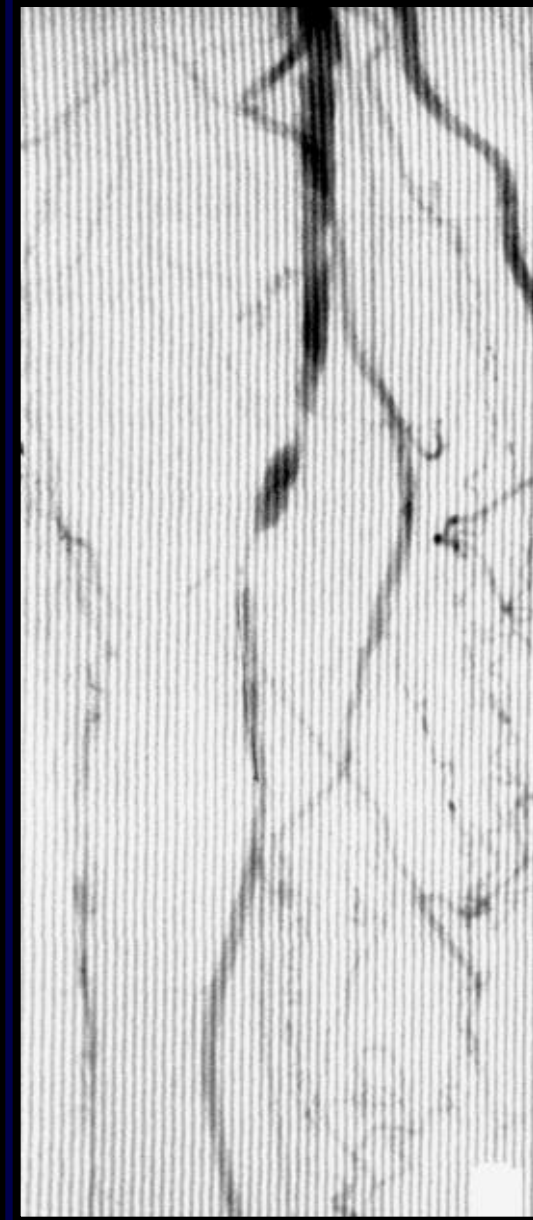
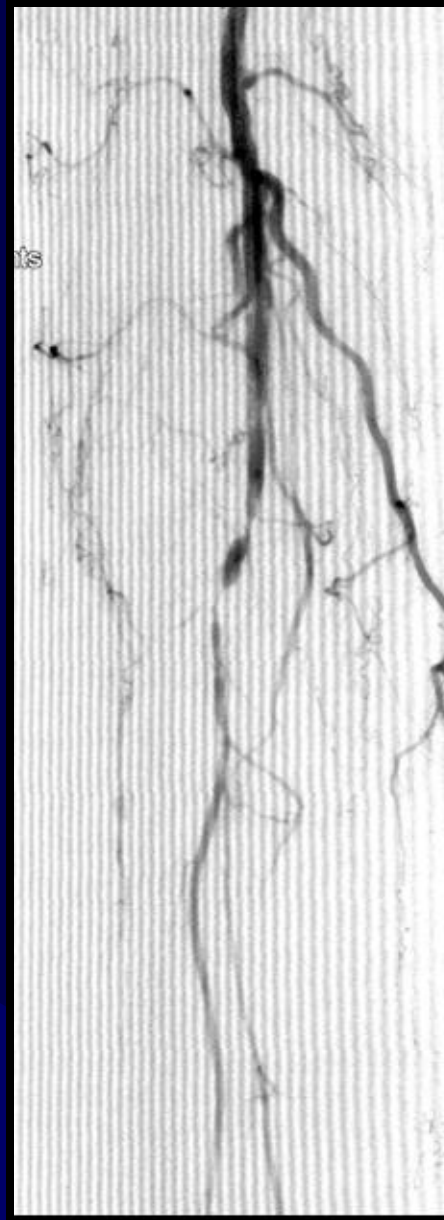


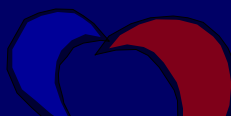
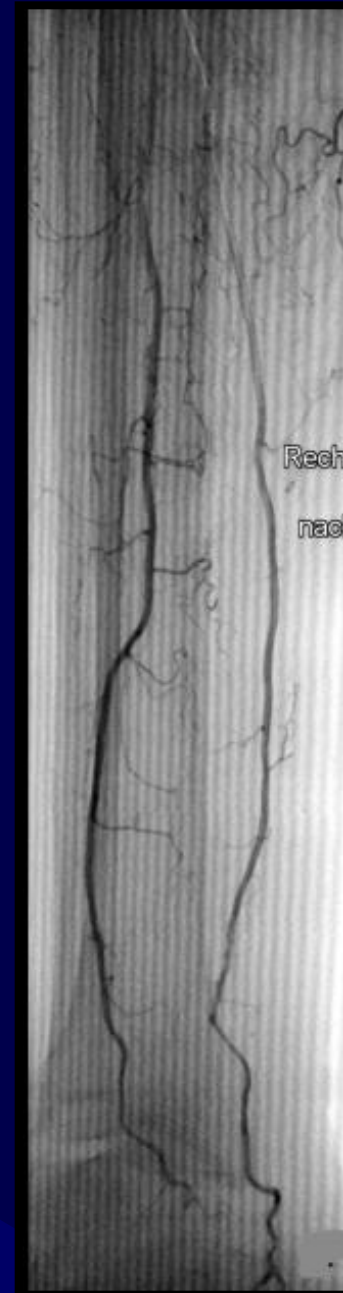
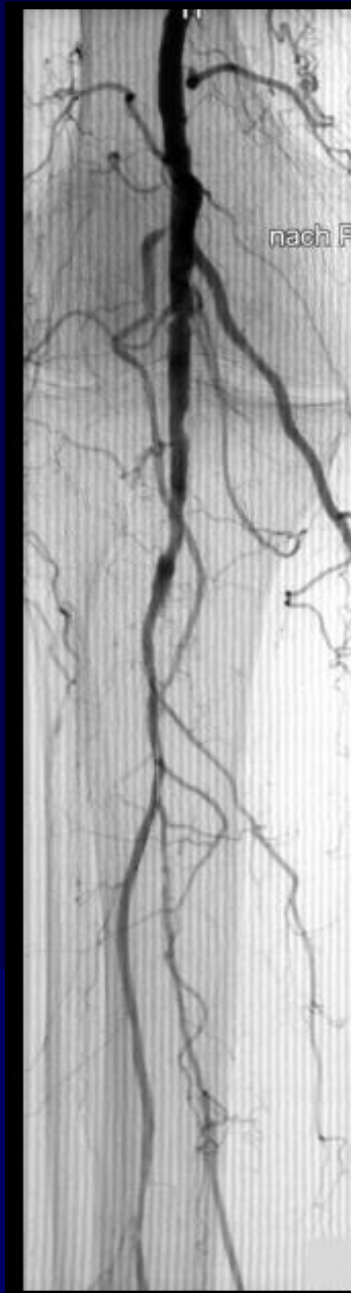
**H.W., male, 72 yrs.**

**CLI right leg (Rutherford 4)**

**Risk factors: Diab. (IDDM),  
renal failure,  
dislipidemia**

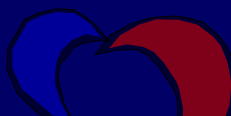
**Therapy: Insulin,  
Statin,  
ASA**





# EXPERIENCES

- Femoro-popliteal and BTK-DEB-PTA in 34 PAD-patients
- 6-month-restenosis-rate (Duplex) 12 %



# EXPERIENCES COLOMBIA

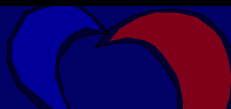
**JP MARTINEZ, J VELEZ, V CALLE, J GONZALES**

Nuestra Señora de los Remedios Clinic

Interventional Radiology and Endovascular Therapy Service, Cali

→ 13 BTK-DEB-PTA in 8 PAD-patients

→ 2-24 months follow-up: 100% amputation free survival and complete wound healing



# **FREEWAY Stent Study**

## **Clinical Study Protocol**

**Stent angioplasty with Paclitaxel-coated balloons  
versus plain stent angioplasty for prevention of  
restenosis due to intimal hyperplasia in peripheral  
arterial occlusive disease**

## **Freeway Stent Study**

**Principal Investigator:**

Prof. Dr. med. Josef Tacke

Institut für diagnostische und interventionelle Radiologie und Neuroradiologie

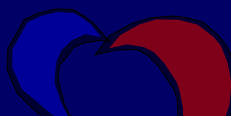
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Germany

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# FREEWAY Stent Study

## Study phase

Phase III study

## Study design

Randomized, prospective, multicenter, open study

## Number of subjects planned

200 included patients

## Randomization

Internet based

## Number of treatment arms

2 treatment arms:

- a) Stent with uncoated balloon catheters
- b) Stent with paclitaxel coated balloon catheters

## Investigational product, manufacturer, dosage, route of administration, and duration of treatment

Paclitaxel: dosage  $3\mu\text{g}/\text{mm}^2$

Coated balloons: Eurocor

Type of balloon catheters: Freeway PTA balloon

Dose:  $3\mu\text{g}$  paclitaxel/ mm/ balloon surface

Route of administration: intra-arterial

Duration of treatment: single treatment inflation 45 - 60 sec.

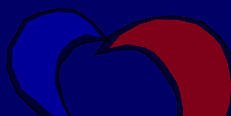
## Endpoints

### Primary endpoint:

Rate of clinically driven target lesion revascularization at 6 and 12 months

### Secondary Endpoints:

- Late lumen loss, i.e. the difference between the minimum lumen diameter after intervention and during the follow-up at 6 and 12 months determined by colour-coded duplex sonography and/or angiography



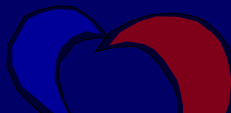
# **FREERIDE** Study

## Freeway Randomized Angioplasty Study

**Prospective, Randomized, Controlled, Multicentre, Open Study**

Release of Paclitaxel during PTA versus PTA alone for the treatment of de-novo occluded, stenotic or, reoccluded, restenotic superficial femoral (SFA) or popliteal arteries

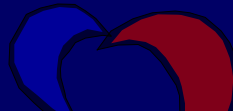
**Principal Investigator:** **Prof. Dr. med. Karl-Ludwig Schulte**  
Vascular Center Berlin /Dept. Internal Medicine  
Ev. Hospital Königin Elisabeth Herzberge  
Academic. Teaching Hospital of the Charité  
Herzbergstraße 79, 10365 Berlin, Germany



# FREERIDE-STUDY

Prospective, Randomized, Multicentre, Open Study  
Release of Paclitaxel during PTA versus PTA alone (incl. bail out stenting) for the treatment of occluded or stenotic superficial femoral or popliteal arteries  
(PI: K-L Schulte)

<b>Investigational Devices</b>	<ul style="list-style-type: none"><li>- Freeway balloon catheter, Paclitaxel-elution</li><li>- Balloon catheter <math>\pm</math> bail out stenting</li></ul>
<b>Study Objective</b>	To Investigate the inhibition of restenosis by the Paclitaxel-eluting PTA balloon Freeway versus PTA or stenting-PTA (bail-out) in the treatment of occluded or stenotic superficial femoral ( $\geq 150\text{mm}$ ) or popliteal arteries
<b>Study Design</b>	Randomized, prospective, multicentre, open study
<b>Primary Endpoints</b>	Absence of clinically driven target lesion revascularization at 6, 12 (and 24) months
<b>Number of Patients</b>	280 patients
<b>Number of sites</b>	$\leq 15$ sites world-wide
<b>Patient Population</b>	Patients with symptomatic one or two legs ischemia, requiring treatment of SFA or popliteal artery (2 or more by Rutherford classification) Patients with documented symptomatic occlusion and/or $>70\%$ stenosis of SFA or popliteal artery in one or both legs



# Role of DEB in infrainguinal interventions

## Summary

- First promising study-results for treatment of femoro-popliteal lesions have been published
- Which drug and which coating technology?
- We need more RCT's

## Technical Problems

- Loss of drug concentration on the long way down to the lesion?!
- Is there need of long protecting introduction catheters?
- Predilatation is a must!

