

# Cost Effectiveness of Endovascular Therapies

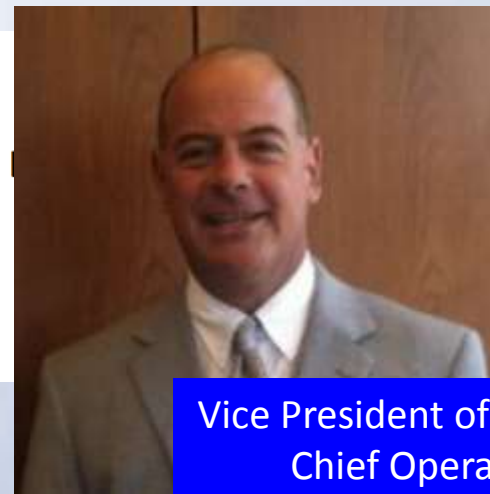
Mark W. Burket, MD

University of Toledo Medical Center  
Toledo, OH



**From:** "Barbee, Daniel L" <[Daniel.Barbee@utoledo.edu](mailto:Daniel.Barbee@utoledo.edu)>  
**Date:** Wednesday, November 4, 2015 at 10:08 AM  
**To:** Mark Burket <[Mark.Burket@utoledo.edu](mailto:Mark.Burket@utoledo.edu)>, "Eltahawy, I" <[I.Eltahawy@utoledo.edu](mailto:I.Eltahawy@utoledo.edu)>  
**Cc:** "Sirio, Carl" <[Carl.Sirio@utoledo.edu](mailto:Carl.Sirio@utoledo.edu)>  
**Subject:** Peripheral Cases

Good morning gentlemen,



Vice President of Clinical Services,  
Chief Operating Officer

[REDACTED]: In this case we used 3 Zilver PTX and 2 Xience stents. The bill has cycled though and we lost \$10,654 on that one case. We need to really scrutinize the medical necessity of these high cost implant cases as financially we are not positioned to absorb this kind of loss.



Chief Operating and Clinical Officer

"Unsustainable"



# Unsustainable...In Whose Eyes?

- 69 year-old retired construction worker
- Left foot rest pain and discoloration
- Failed left fem-pop graft
- Failed profunda angioplasty
- Occlusion from SFA origin into anterior tibial
- Offered amputation
- “Feel too good to come to clinic”

## Medicare DRG and MDC Information



241

AMPUTATION FOR CIRC SYS DISORDERS EXC  
UPPER LIMB & TOE W/O CC/MCC

1.4476 A/LOS 5.3 G/LOS 4.5

stay, discharge to a post-acute care provider,

service condition codes can significantly impact  
payment

DRG.

# What The Hospital Gets Paid

005

DISEASES & DISORDERS OF THE CIRCULATORY

Above the Knee Amputation  
DRG 241

Payment to Hospital: \$11,245

Medicare Inpatient

C Information



180

OTHER CIRCULATORY SYSTEM PROC

APR wt 1.4866 Low Trim 1 High Trim 20 ALOS  
5.51 GLOS 4.27

Status: LOS Inlier

005

CIRCULATORY SYSTEM

2

Moderate Severity of Illness

2

Moderate Risk of Mortality

Admit Diagnosis

1998

Other disorder of circulatory system



Principal Diagnosis

# Outcomes and Costs

Primary Strategy	5 Year Survival	5 Year Limb Salvage	Years of Ambulation	Total Cost
Wound Care	26%	14%	1.71	\$ 118,086
Amputation	24%	0%	1.19	\$ 152,426
Endovascular	25%	65%	1.93	\$ 121,478

Rutherford 5 patients with end-stage renal disease  
Barshes. J Vasc Surg 2014;60:369-374

# Understanding Financial Incentives

- Aligned: all the players have the same objectives
  - Patient
  - Hospital
  - Payer
- Typical: poor alignment
- Common: opposite alignment

# Insured Patient

- Most durable outcome regardless of cost

# Payer/Self-Pay Patient

- Lowest long-term cost
- Higher initial cost OK if offset later



# Hospital

- Lowest cost per procedure
- **No** money-losing procedures
- Greatest number of profitable procedures

# Physicians

- Lots of procedures
- Higher paid procedures rather than lower
- Concerned about equipment cost only if directly or indirectly affected

# Many Interventionalists Have No Idea...

- Cost of equipment used in a case
- Total cost of the case
- Downstream cost

# Do You Know These Costs?

*Simple is pretty cheap!*



6 French sheath  
\$ 9



"Commodity" Balloon  
\$ 98



0.035" J Wire  
\$ 8

Total  
\$ 815



"Cheap" Nitinol  
Stent  
\$ 700

(Prices vary depending upon location and vendor contract)

# Stents Vary Widely in Cost

Nitinol Tube  
\$ 700



Woven Nitinol  
\$ 1850



Paclitaxel-coated  
\$ 1795



5X

15 cm PTFE-Covered  
\$ 3495



(Prices vary depending upon location and vendor contract)

# You May Not Be Able To Afford These!



\$2775

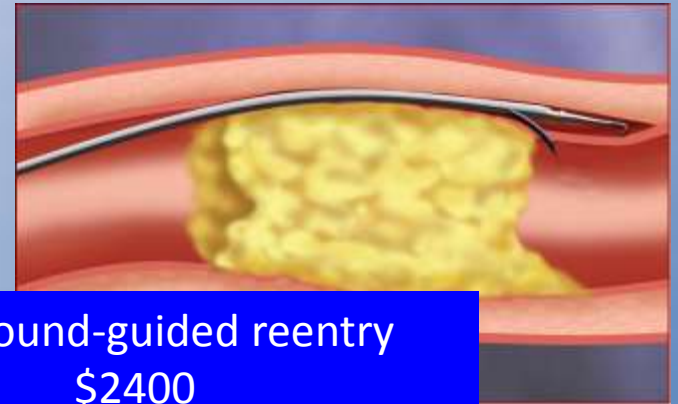
Atherectomy



\$3290



Embolic Protection Device  
\$1550



Ultrasound-guided reentry  
\$2400

(Prices vary depending upon location and vendor contract)

# Why You Need to Know These Costs

- Almost every health care system limits cost that can be paid for equipment
- US: Medicare is the single biggest payer for healthcare services
- Fixed payment to hospital for a specific procedure
- Outpatient femoral angioplasty and stent: \$9624

# Hospital Profit/Loss: Outpatient Femoral Stent Procedure

Scenario	1 Cheap Stent	2 PTFE Stents	3 Woven Stents
APC	\$9624	\$9624	\$9624
Stent	-\$700	-\$6990	-\$5550
Balloon (1 or 2)	-\$98	-\$300	-\$600
Crossing Catheter			-\$115
Re-Entry Device			-\$2400
<b>Remaining</b>	<b>\$8826</b>	<b>\$2334</b>	<b>\$959</b>

Remaining = “Headroom”



# IS A THERAPY WORTH IT?

*A payer's perspective*

# Long-Term Cost

## Two-Year Comparison

	Cost Excess Over PTA*	TLR	Cost of Next Procedure*	Follow-up Cost	Follow-Up Plus Initial
PTA	0	52% <sup>ˆ</sup>	\$7529	\$3915	\$3915
BMS	\$748	28.1% <sup>º</sup>	\$10782	\$3030	\$3778
DEB	\$1500	14.3% <sup>º</sup>	\$7529	\$1077	\$2577
DES	\$1843	13.4% <sup>˝</sup>	\$10782	\$1445	\$3288
DCA	\$4718 <sup>˜</sup>	21% <sup>ˆ</sup>	\$7529	\$1506	\$6224

**The Lowest Long-Term Cost is Associated with DEB**

**Next Lowest: DES**

**Atherectomy would be most expensive *even with 0% TLR!***

\*Based on actual cost UT Medical Center, and MD reimbursement. Assumes angioplasty TLR involves stent, stent TLR involves atherectomy

<sup>ˆ</sup>Based on THUNDER 2 year results Tepe N Engl J Med 2008;358:689-99

<sup>º</sup>Based on Pietzsch Catheter Cardiovasc Interv 2014

<sup>˝</sup>Based on Dake J Am Coll Cardiol 2013;61:2417-27

<sup>˜</sup>Assumes use of embolic protection device and uses the average cost of 2 commercially available atherectomy devices

<sup>ˆ</sup>Based on Garcia L, LINC Leipzig, Germany

All estimates based on 2 year TLR except DCA, which is 1 year

# The Insanity of Nonaligned Incentives

- Patients and payers want the opposite of what hospitals want!
- Physicians get paid more for worse procedures!



# Stopping the Insanity

- Linking payments to proven long-term efficacy
  - US: Medicare pays more for inpatient DES
  - Drug-eluting balloons now reimbursed dollar for dollar *in hospitals*
- Models for shared risk for long-term costs

# Summary

- Financial realities place significant pressure on idealism
- Ultimately the “Golden Rule” is still the best: give the treatment you would want
- It pays to know the numbers

# Office Based Labs

- No additional reimbursement for DES (versus BMS)
- No additional reimbursement for DEB (versus POBA)
- Strong, direct financial incentives to:
  - Know the cost of each device
  - Negotiate for the lowest price
  - Use the cheapest product regardless of long-term outcome

# Medicare Payments

## 2015 Medicare Reimbursement Rates (National Average)

Setting	Service(s) Performed	Facility Payment	Physician Payment
Hospital Outpatient	Angioplasty	\$4,537	\$484
	DCB	\$4,537 (+ cost of DCB(s))	\$484
	Stenting (BMS, covered, DES)	\$9,624	\$569
	Atherectomy	\$9,624	\$654
	Stenting + Atherectomy	\$14,841	\$787
Hospital Inpatient	Vascular Procedure (no complications)	\$9,331 (+ any DRG add-on payment(s))	Same as Hospital OP Payment
	Vascular Procedure (minor complications)	\$13,769 (+ any DRG add-on payment(s))	
	Vascular Procedure (major complications)	\$17,605 (+ any DRG add-on payment(s))	
OBL	Angioplasty	\$3,920	Leftover from Facility Payment
	DCB	\$3,920	
	Stenting (BMS, covered, DES)	\$9,273	
	Atherectomy	\$11,276	
	Stenting + Atherectomy	\$15,227	

OBL: office-based laboratory

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No disincentive to use drug-eluting balloons in hospital

OBL: office-based laboratory



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Strong disincentive to use high-cost stents

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Strong disincentive to use drug-coated balloons or high-cost stents

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Little or no incentive for physicians to use least expensive equipment

OBL: office-based laboratory

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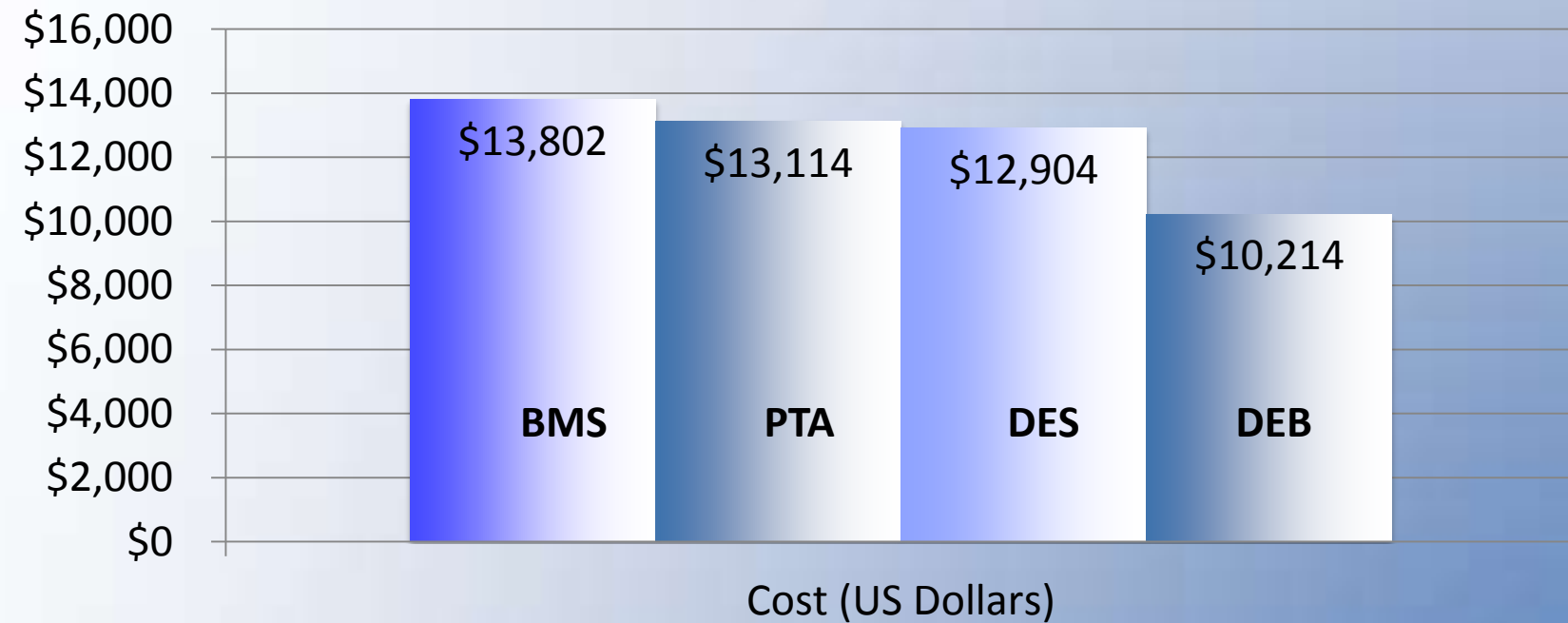
Powerful incentive for physicians to know cost, negotiate price, and use least expensive equipment

OBL: office-based laboratory

# Budget Impact Model

- Pietzsch, Geisler, Garner, Zeller, Jaff
- Assumptions:
  - Lesion length: 7.5 cm
  - One (at most 2) devices per intervention
  - Maximum of 1 TLR over 2 years
  - 50:50 inpatient to outpatient mix
  - ***No additional payment for paclitaxel technologies***

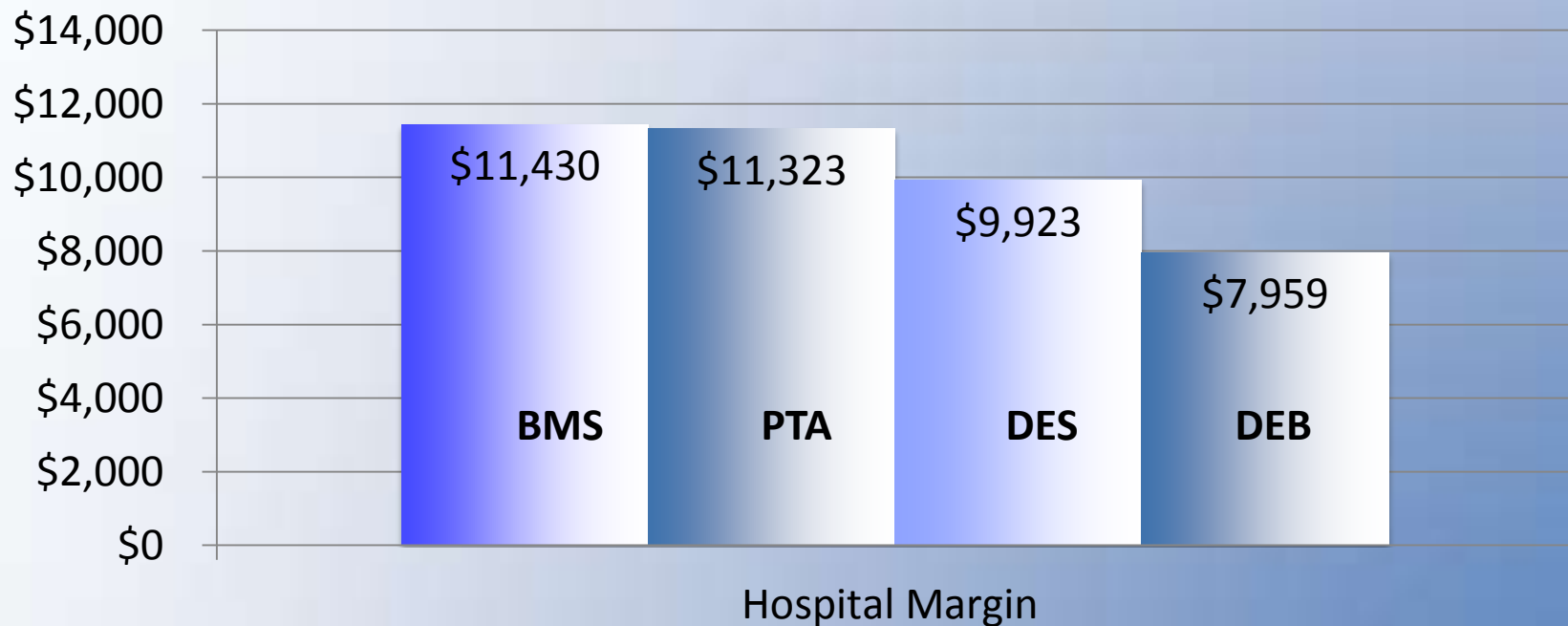
# 2-Year Total Cost



**Similar outcome in German healthcare system**

# “Headroom”

(Why Hospitals and Payers Don’t See Eye-to-Eye)



# Disclosures

Bard Vascular: Research Support

Biotronik: Research Support, Consultant

Cook Medical: Research Support, Speaker

Mark W. Burket, MD  
University of Toledo Medical Center  
Toledo, Ohio

