



## Why PTFE Bypasses to Infrapopliteal Arteries Have Been A Controversial Procedure For More Than 40 Years – And Why They Continue to Be

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### Disclosures:

**Novo Nordisk Foundation**



- Grant Recipient

**Janssen, Inc**

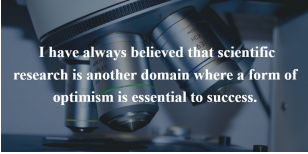
- Advisory Board

• **Anges, Inc**


- DSMB



### You have to be a believer...



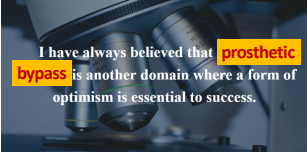
I have always believed that scientific research is another domain where a form of optimism is essential to success.




Daniel Kahneman, Princeton



### You have to be a believer...



I have always believed that **prosthetic bypass** is another domain where a form of optimism is essential to success.

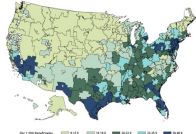
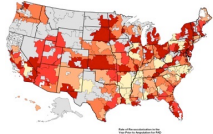
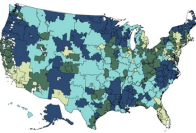


Daniel Kahneman, Princeton



### Regional variation:

in prevalence of CLI, amputation in CLI, and revascularization for CLI in Medicare database



Goodney et al. Circulation Cardiovasc. Qual and Outcomes 2011

Eid et al, manuscript in preparation, 2021

## You are either a believer... ...or you're not

*There are many nihilists across the land*


**Copernicus**



In 1616 the Church banned Copernicus's blasphemous book completely

ANGIO AFTER 4 YRS  
LIMB SALVAGE 6 YRS

DIABETIC RECOM AT 3 HOSPITALS



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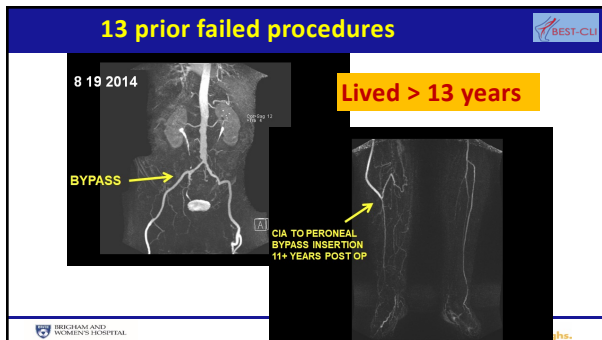
13 prior failed procedures

8 19 2014

**Lived > 13 years**

BYPASS

CIA TO PERONEAL BYPASS INSERTION 11+ YEARS POST OP

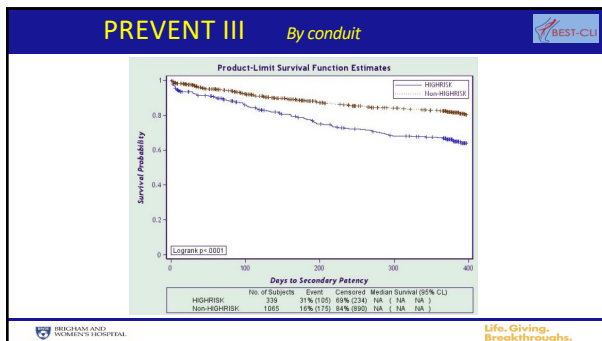


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**Greater Saphenous Vein**

	Primary Graft Patency @ 5 years	Secondary Graft Patency @ 5 years	Limb Salvage @ 5 years
<b>Taylor et al.</b> (JVS 1990) n = 300 reversed GSV	80%	84%	90%
<b>Shah et al.</b> (Ann Surg 1995) n = 2048 in situ GSV	72%	81%	95%

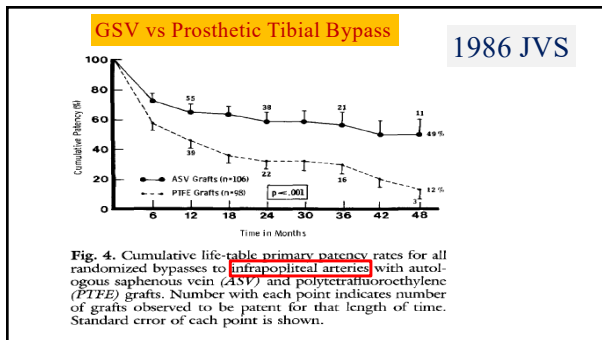
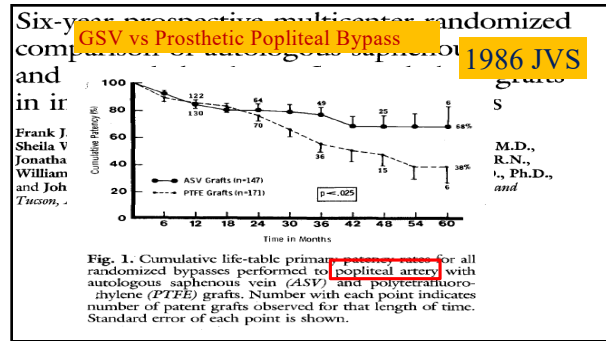
**Why is it that...**

**...highly satisfying feeling you get after a hard-fought bypass,**

**... is so elusive with endo?**




**satisfaction**




**Procedural Characteristics : Bypass (ITT)**

Surgical Bypass Details, n(%)	Cohort 1			Cohort 2		
	Overall (N=1355)	Open (N=687)	Endo (N=708)	Overall (N=385)	Open (N=190)	Endo (N=196)
Bypass using SSGSV	639 (45.8)	581 (84.6)	58 (8.2)	45 (11.7)	37 (19.5)	8 (4.1)
Bypass using alternative Vein	31 (2.2)	31 (4.5)	0 (0.0)	48 (12.5)	40 (21.1)	8 (4.1)
Bypass conduit						5 (2.6)
Femoropopliteal Bypass						14 (7.2)
Above the knee						14 (7.2)
Below the knee						0 (0.0)
Femoropopliteal Bypass	116 (8.3)	105 (15.3)	11 (1.6)	46 (11.9)	44 (23.2)	2 (1.0)
Below the knee						0 (0.0)
Femoropopliteal Bypass	191 (13.7)	170 (24.7)	21 (3.0)	59 (15.3)	47 (24.7)	12 (6.2)

**Prosthetic Cohort 1 & 2: 169/877 (19%)**

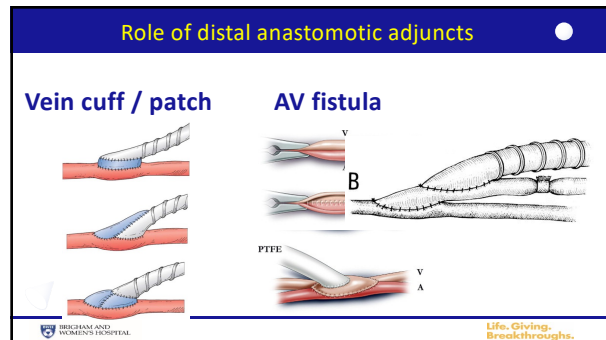
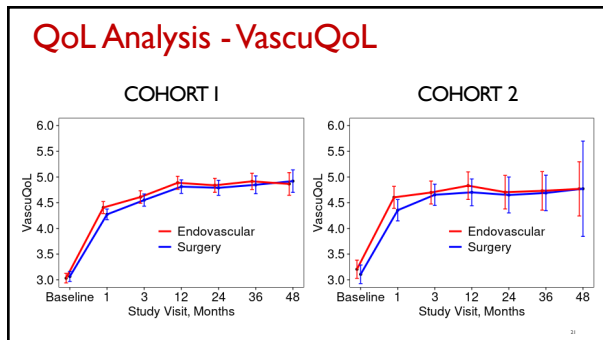
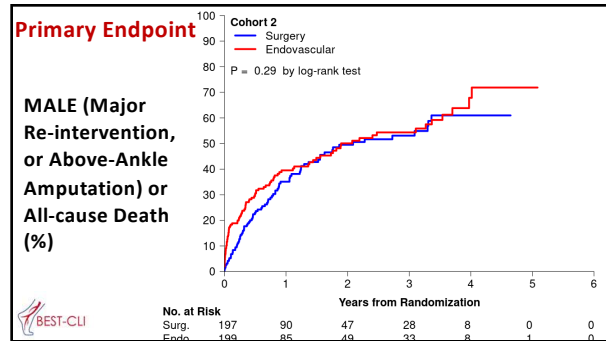
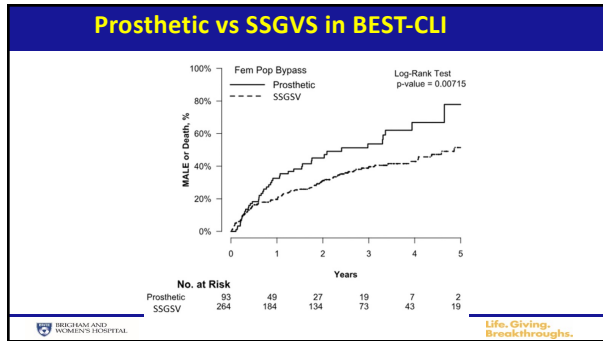
**JVS** Journal of Vascular Surgery | **SVS** Society for Vascular Surgery

From the New England Society for Vascular Surgery

**Prosthetic conduits have worse outcomes compared with great saphenous vein conduits in femoropopliteal and infrapopliteal bypass in patients with chronic limb-threatening ischemia**

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### Tibial Bypasses for CLI

**BWH Unpublished Experience: 2007-2017, n=62**

	Distaflo (35)	Propaten(27)
• 3-year Primary Patency:	48%	76% (0.04)
• 3-year Limb Salvage:	73%	75% (0.43)

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### Impact of Tibial Bypass Conduit on Long-Term Amputation-Free Survival and Primary Patency in the Vascular Quality Initiative

JVS, November, 2021: Dalmia et al (Montefiore)

**1 Year Primary Patency, first-time elective tibial bypass, n=4192**

• Single-segment GSV:	69%	
• <b>Prosthetic with a vein cuff:</b>	<b>69%</b>	(p=0.51)
• Arm vein	60%	
• Composite	55%	(p=0.14)

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### Three Decades of Bypass Grafts @ BWH for CTLI

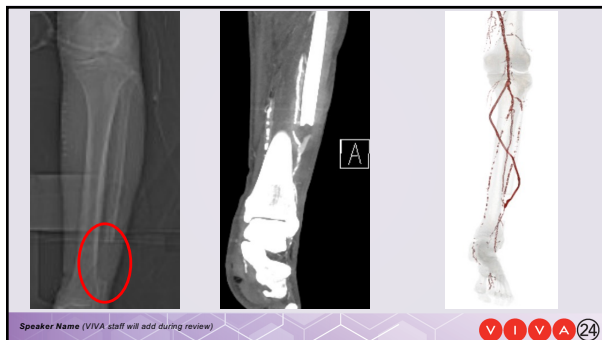
	1985 - 1999 n= 1179	2000 - 2015 n= 1131	P-value
Smoking	454 (38.5%)	331 (29.3%)	0.001
Diabetes	599 (50.8%)	674 (59.6%)	0.001
Hypertension	710 (60.2%)	844 (74.6%)	0.001
Coronary artery disease	604 (51.2%)	626 (55.3%)	0.047
Congestive heart failure	117 (9.9%)	220 (19.4%)	0.001
Atrial fibrillation/Arrhythmia	103 (8.7%)	207 (18.3%)	0.001
Stroke	141 (12.0%)	163 (14.4%)	0.081
Chronic renal insufficiency	162 (13.7%)	237 (21.0%)	0.001
Dialysis	100 ( 8.5%)	134 (11.8%)	0.007

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### Results – Indications and Conduit

	1985 - 1999 n= 1179	2000 - 2015 n= 1131	P-value
Indication			
Rest pain	500 (42.4%)	409 (36.3%)	0.002
<b>More tissue loss, more prosthetic</b>			
In situ saphenous	463 (39.3%)	77 (6.8%)	0.001
Arm vein	42 (3.5%)	39 (3.5%)	0.882
Prosthetic	92 (7.8%)	240 (21.2%)	0.001
PTFE	84 (7.1%)	182 (16.1%)	0.001
Dacron	7 (0.6%)	24 (2.1%)	0.001
Cadaveric vein	0 (0%)	34 (3.0%)	0.001

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- ### Summary: Open surgical bypass to tibial targets
- > Do the best operation you can.
  - > Nothing beat Single Segment Saphenous Vein
  - > "No useable vein" – sometimes means the surgeon didn't look very hard
  - > Sometimes ectopic autogenous conduit is preferable
  - > **Prosthetic bypass is an acceptable option, works well in well- selected patients, and can save limbs**
- BRECHMAN AND WOMEN'S HOSPITAL **Life. Giving. Breakthroughs.**



*Thank you very much!*