

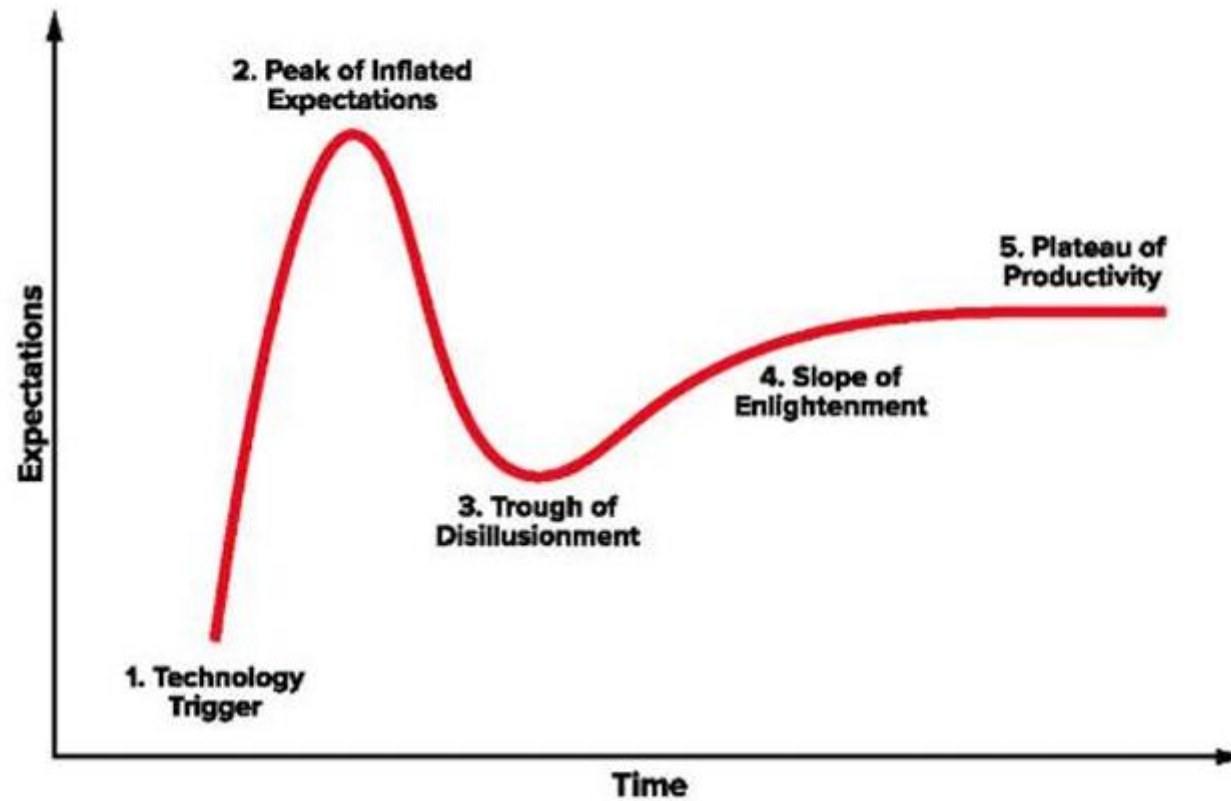
This Year's Highlights in CHIP Enlightenment in the year 0 AD

Dr García Touchard

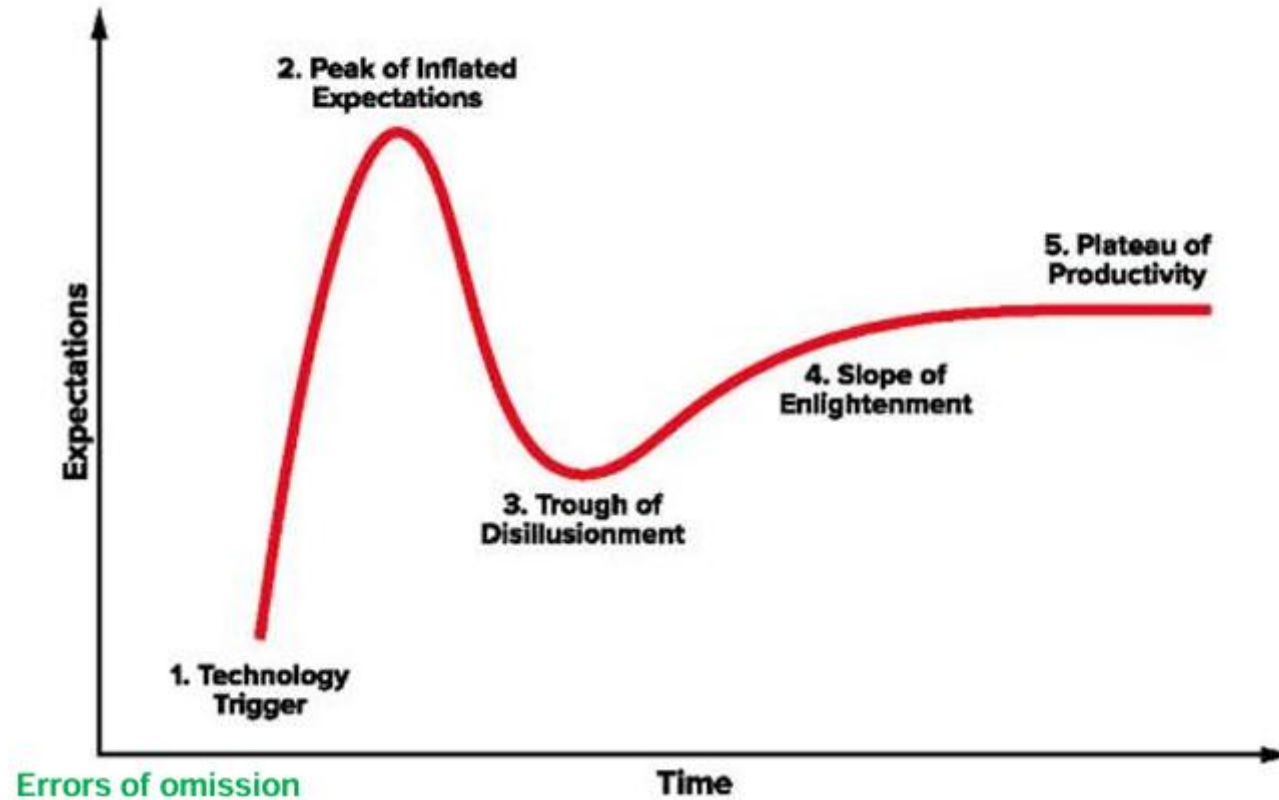
Cardiología Intervencionista

Hospital Puerta de Hierro Majadahonda

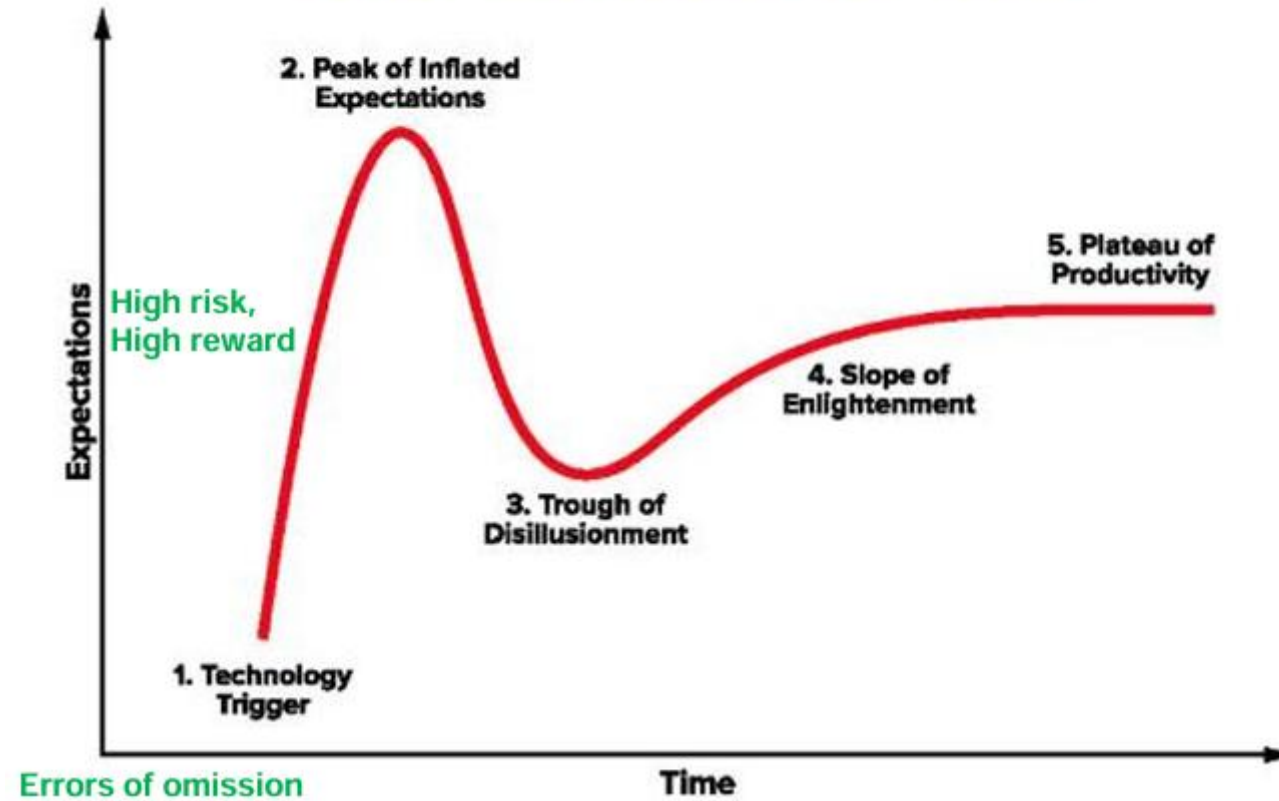
CHIP: Where are we?



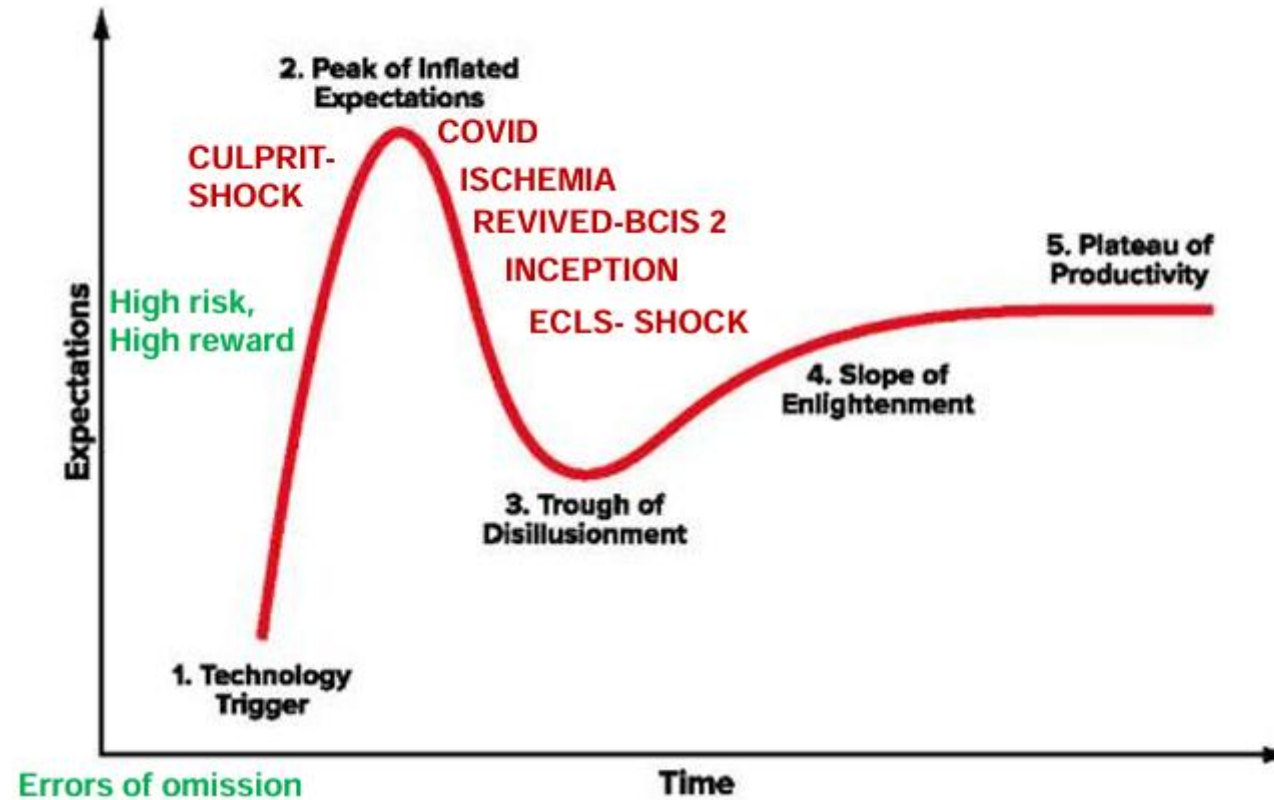
CHIP: Where are we?



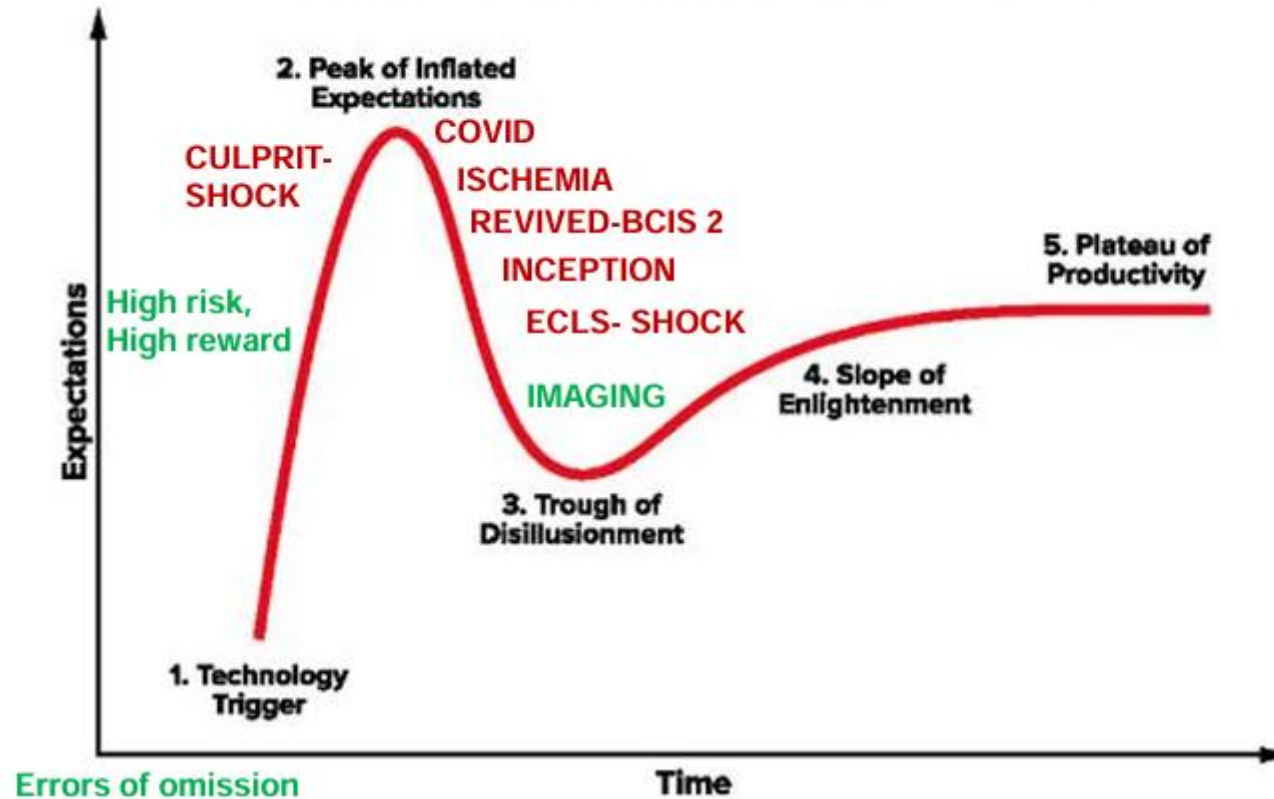
CHIP: Where are we?



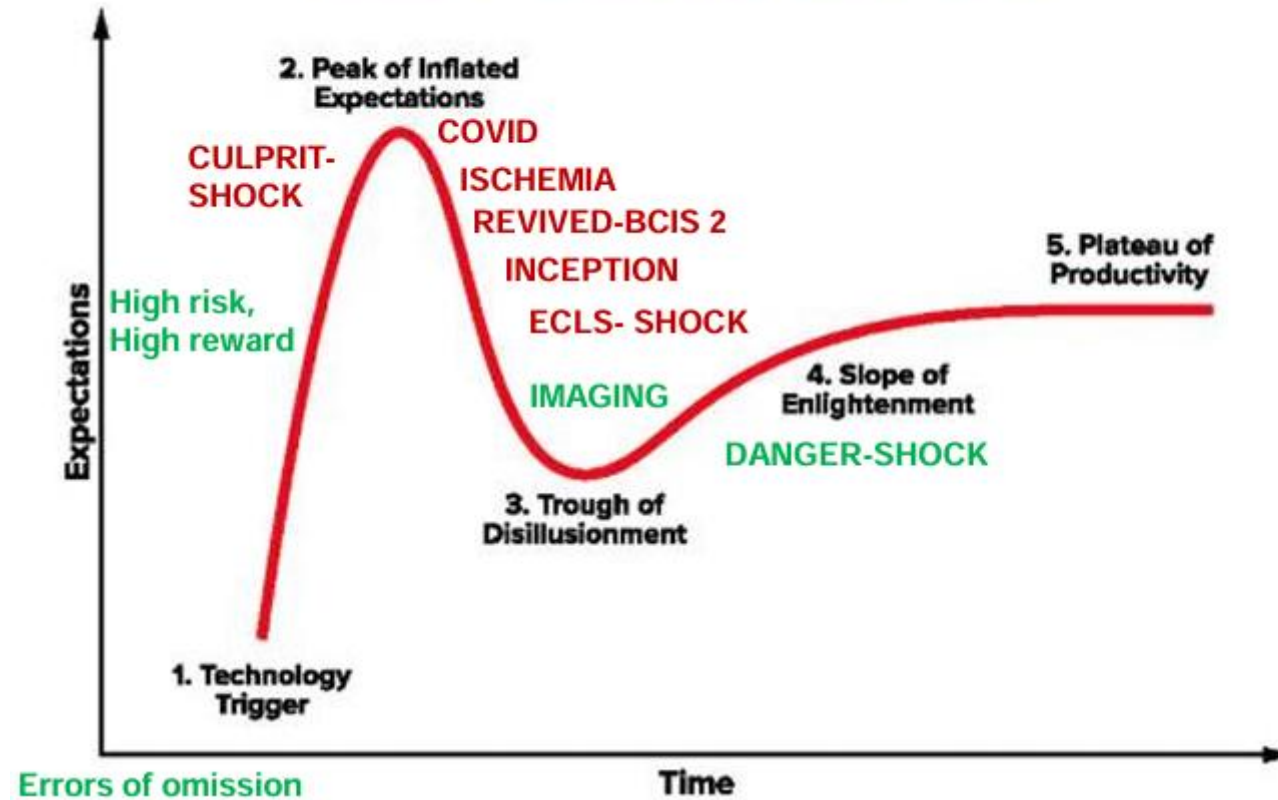
CHIP: Where are we?



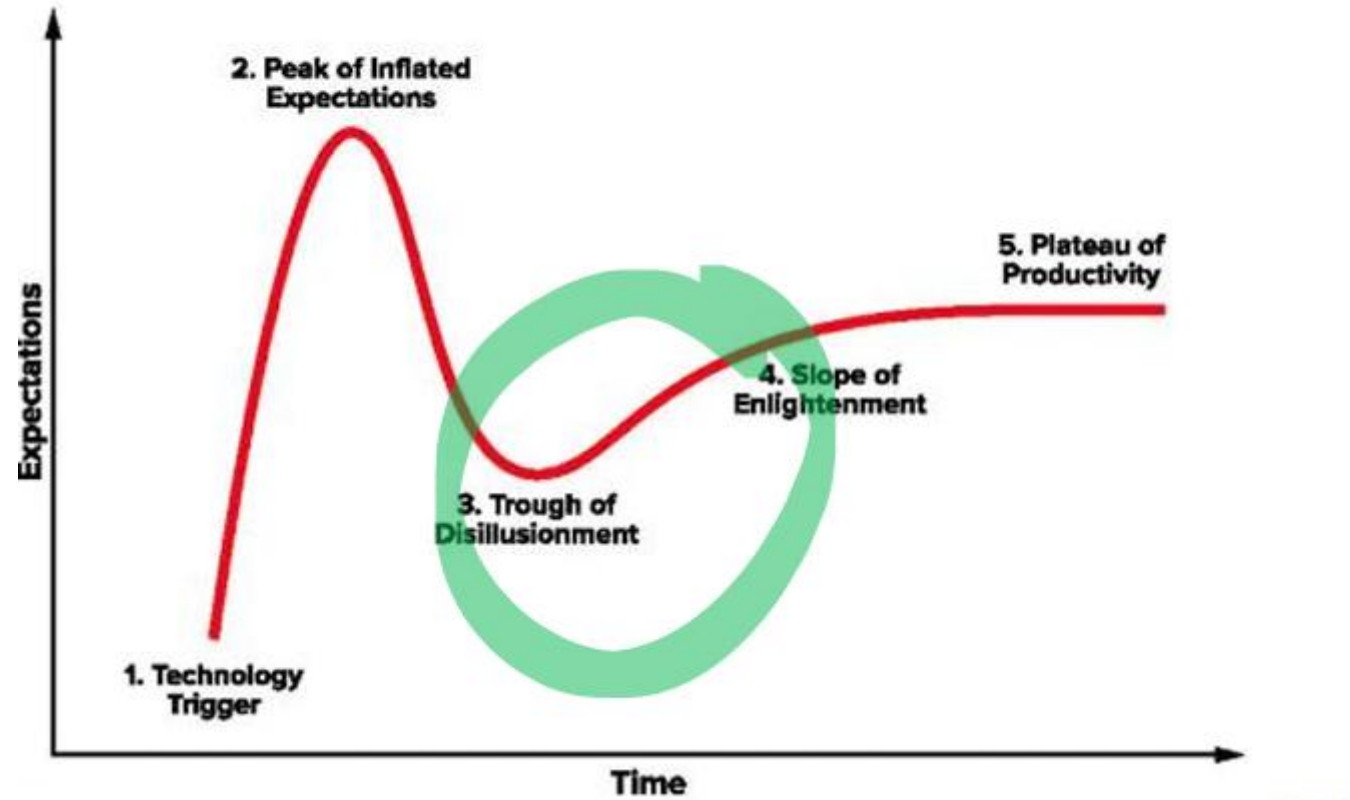
CHIP: Where are we?



CHIP: Where are we?



CHIP: Where are we?



More than your average resurrection

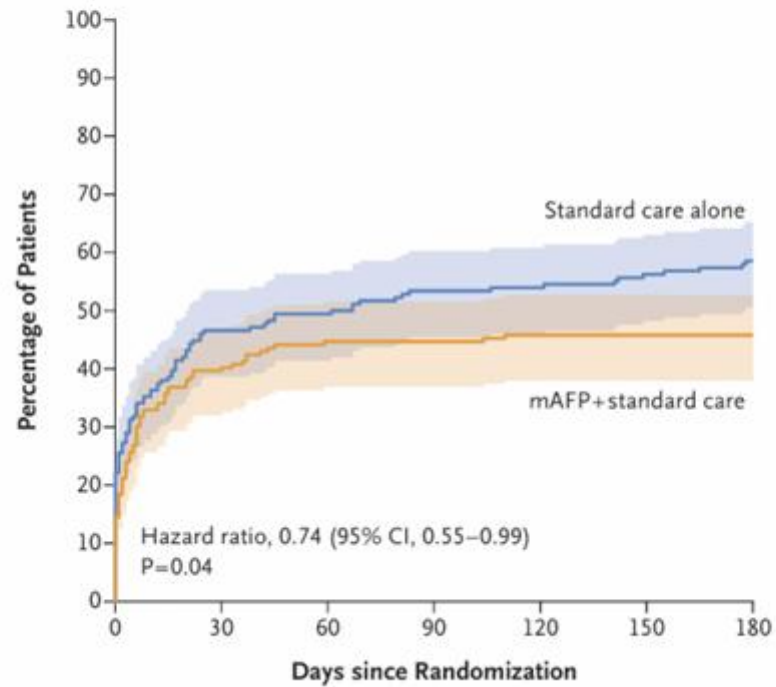
ORIGINAL ARTICLE

Microaxial Flow Pump or Standard Care in Infarct-Related Cardiogenic Shock

J.E. Møller, T. Engstrøm, L.O. Jensen, H. Eiskjær, N. Mangner, A. Polzin,
P.C. Schulze, C. Skurk, P. Nordbeck, P. Clemmensen, V. Panoulas, S. Zimmer,
A. Schäfer, N. Werner, M. Frydland, L. Holmvang, J. Kjærgaard, R. Sørensen,
J. Lønborg, M.G. Lindholm, N.L.J. Udesen, A. Junker, H. Schmidt, C.J. Terkelsen,
S. Christensen, E.H. Christiansen, A. Linke, F.J. Woitek, R. Westenfeld,
S. Möbius-Winkler, K. Wachtell, H.B. Ravn, J.F. Lassen, S. Boesgaard, O. Gerke,
and C. Hassager, for the DanGer Shock Investigators*

The *right* RCT

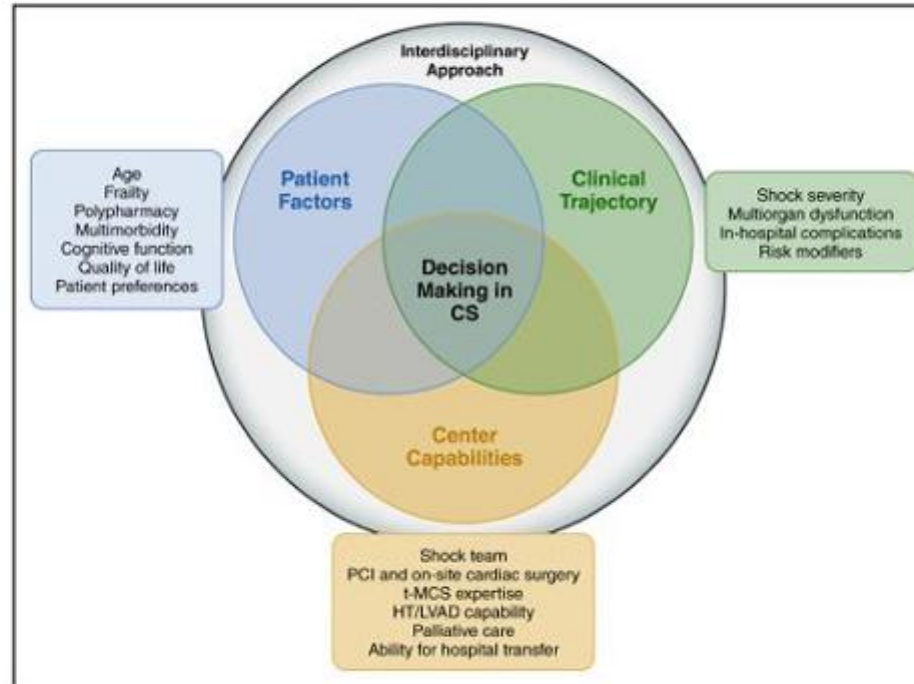
A Death from Any Cause



N Engl J Med 2024;390:1382-1393

Right person, right place, right time...

Limited
competing
risks

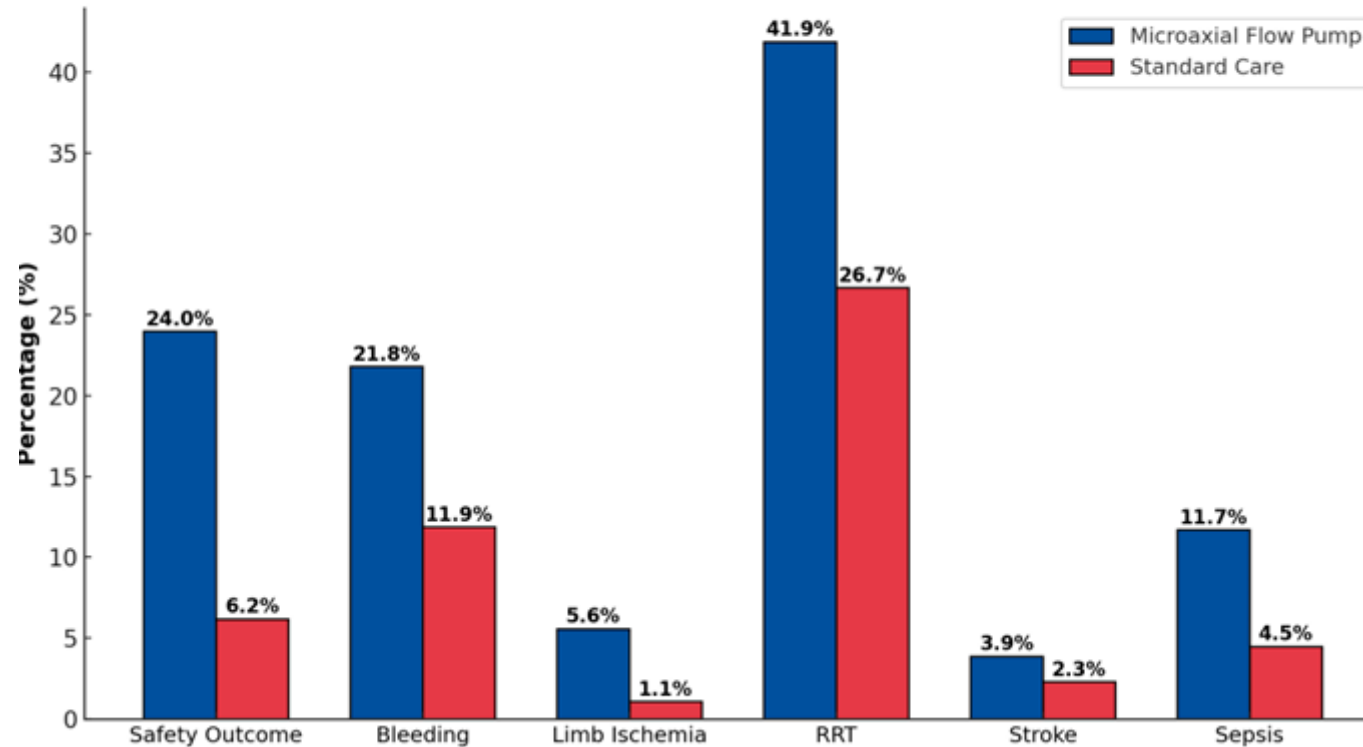


Acute, severe,
and reversible
heart function
decline

Timely access to specialized, high-volume centers

Circulation 2024. 149(14):e1051-e1065.

Hop on the bandwagon carefully



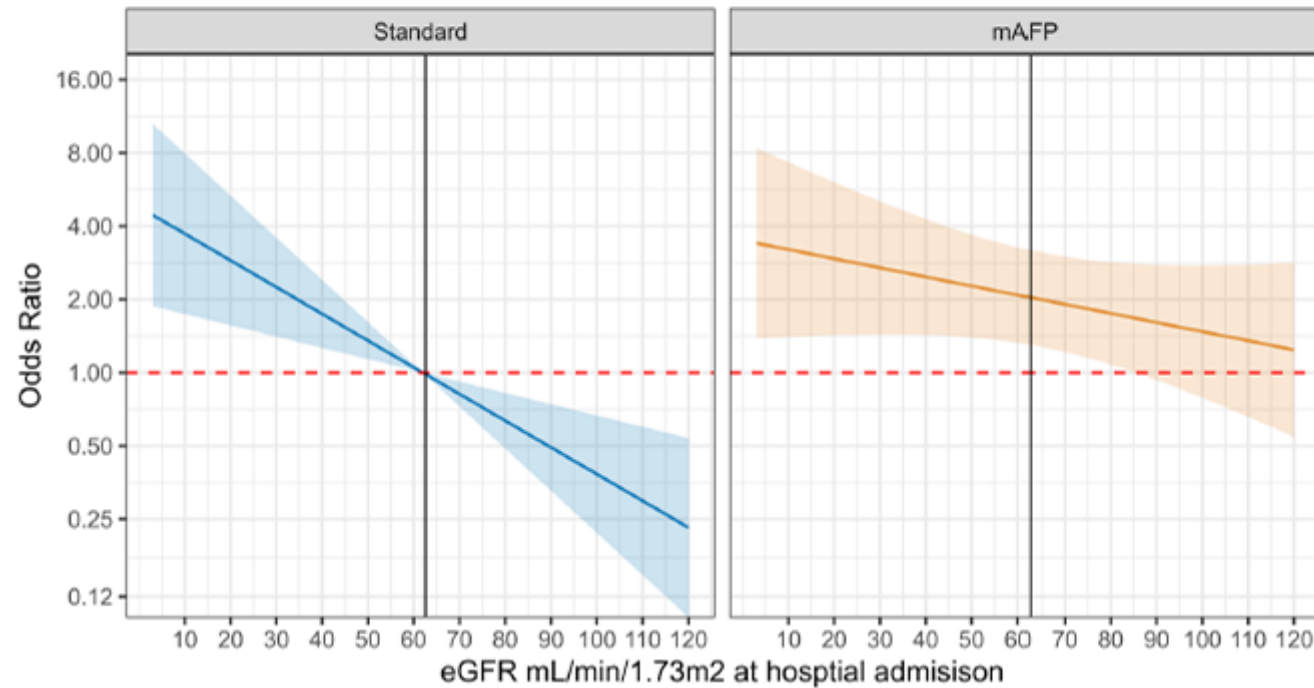
N Engl J Med 2024;390:1382-1393

Physiology absolved

- Lower vasoactive-inotropic score to maintain target MAP
- Lower arterial lactate levels on ICU arrival (1.5 mmol/L; 95% CI, 0.7-1.9 mmol/L)
JAMA Cardiology. 10(1):9-16, 2025 Jan 01.
- Faster lactate normalization (12 hours earlier; 95% CI, 5-18 hours)

Physiology absolved

A Risk of AKI across admission eGFR
(ref=62 mL/min/1.73m² and standard-of-care)



Circulation. 2024;150:1990–2003

Does device matter?

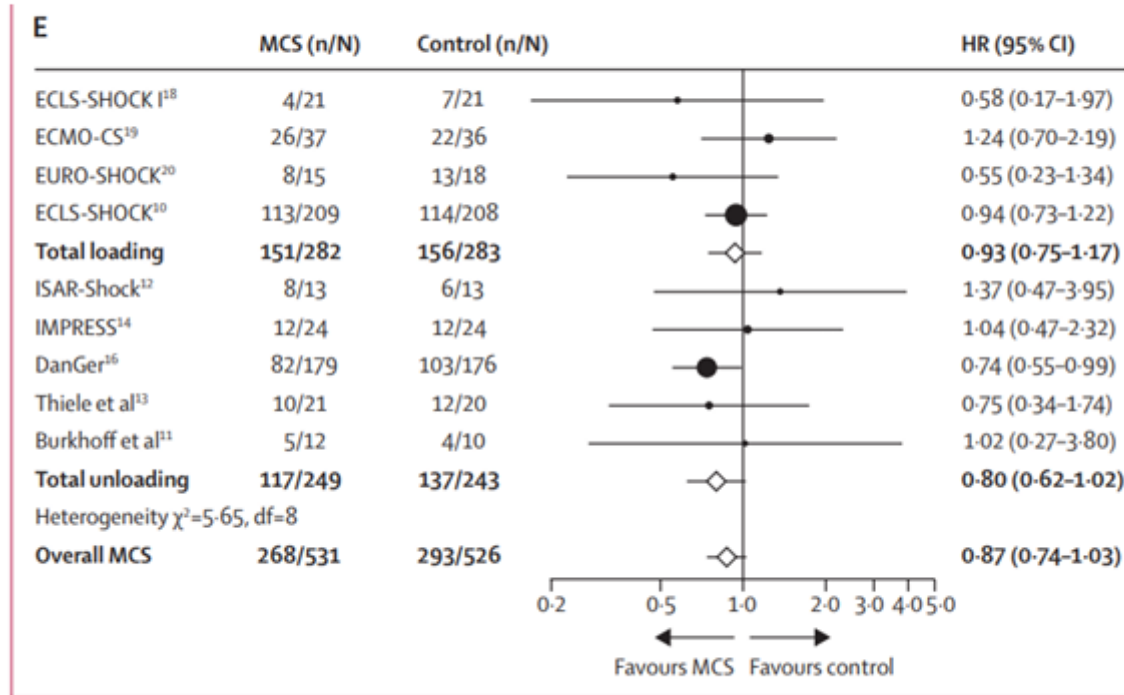


Figure 2: 6-month all-cause mortality for mechanical circulatory support vs control

Does population matter?

	MCS (n/N)	Control (n/N)	HR (95% CI)	P-value
Age, years				
≥70	110/172	137/197	0.81 (0.63-1.05)	0.41
<70	158/358	156/329	0.95 (0.76-1.18)	

	Total patients (n=1059)	Mechanical circulatory support group (n=533)	Control group (n=526)	Effect size (95% CI)
Primary endpoint (death at 180 days)*				
Intention-to-treat population	53.3% (50.3-56.3)	50.7% (46.5-55.0)	55.9% (51.7-60.2)	HR 0.87 (0.74-1.03)
Patients receiving loading devices	54.4% (50.3-58.5)	53.6% (47.9-59.6)	55.1% (49.4-61.0)	HR 0.93 (0.75-1.17)
Patients receiving unloading devices	52.0% (47.7-56.6)	47.3% (41.3-53.7)	56.9% (50.8-63.3)	HR 0.80 (0.62-1.02)
Patients with ST-segment elevation myocardial infarction and low risk of hypoxic brain injury	49.9% (45.9-54.0)	44.5% (39.0-50.3)	55.4% (49.7-61.1)	HR 0.77 (0.61-0.97)

TIMI after PCI				
0-2	44/81	66/87	0.57 (0.38-0.85)	0.024
3	198/406	207/402	0.93 (0.76-1.13)	
Systolic blood pressure, mm Hg				
<80	65/141	85/135	0.63 (0.46-0.87)	0.047
≥80	152/314	157/304	0.93 (0.74-1.16)	

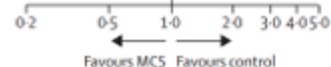
Lancet 2024; 404: 1019-28

Does population matter?

	MCS (n/N)	Control (n/N)		HR (95% CI)	P _{interaction}
Age, years					
≥70	110/172	137/197	●	0.81 (0.63-1.05)	0.41
<70	158/358	156/329	●	0.95 (0.76-1.18)	
Sex					

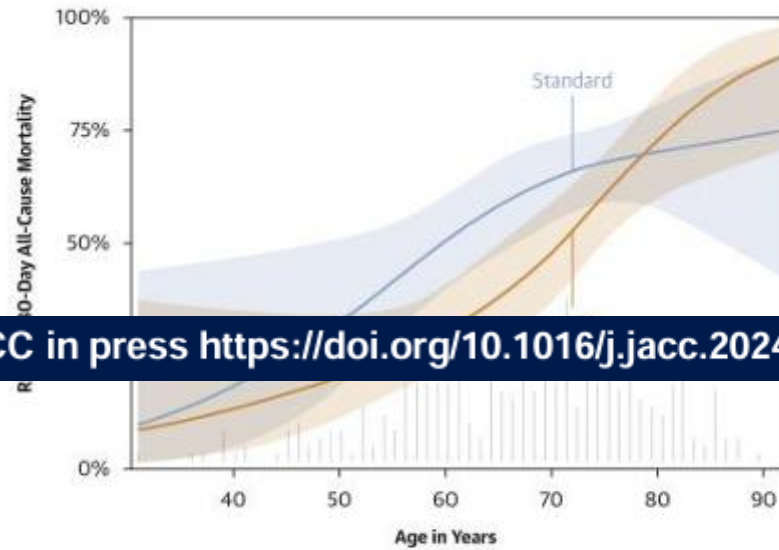
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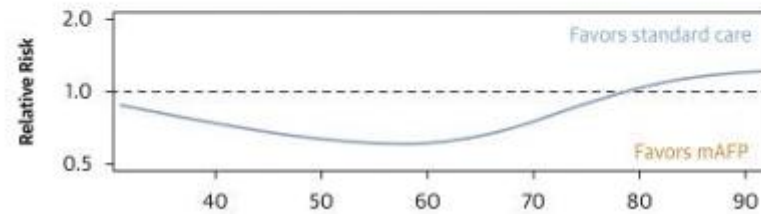


Lancet 2024; 404: 1019-28

Does age matter?

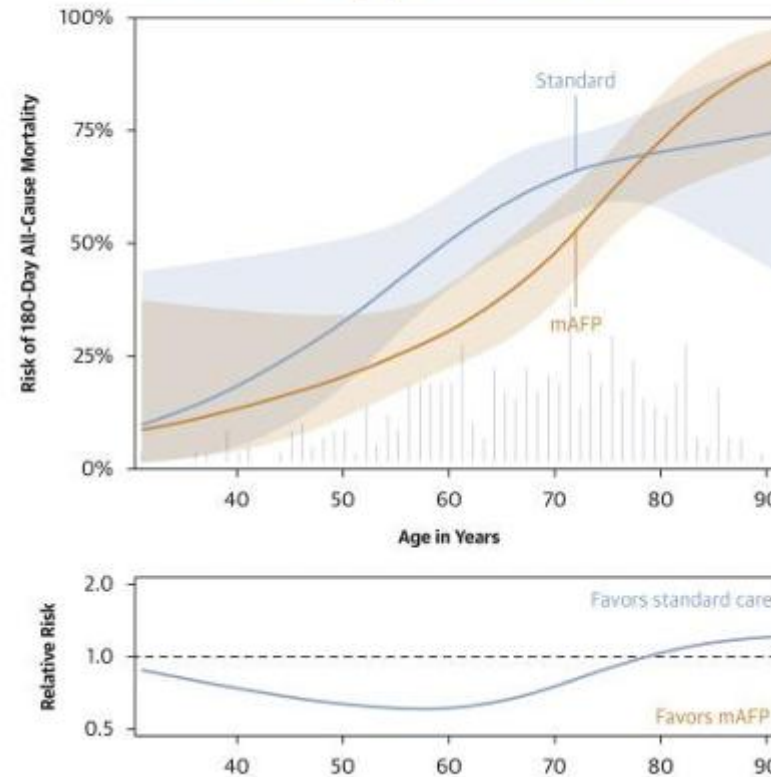


JACC in press <https://doi.org/10.1016/j.jacc.2024.11.003>



**Higher risk
≠
Higher reward**

Does age matter?

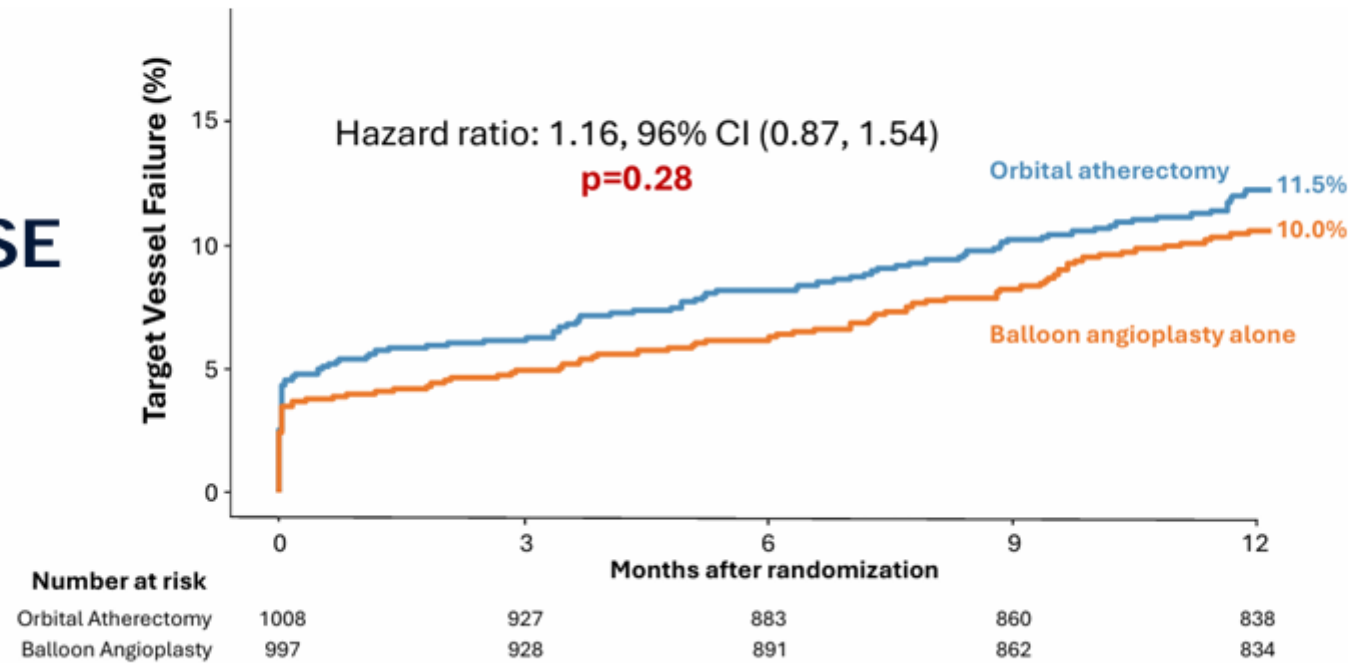




Calcium = CHIPtonite

To drill or not to drill

ECLIPSE



TVF at 1
year

Kirtane AJ. ECLIPSE. TCT 2024.

Minimal Stent Area

	Orbital atherectomy	Balloon angioplasty
Number of lesions	286	292
Median	7.44	7.05
[25 th , 75 th percentiles]	[6.03, 8.94]	[5.78, 8.66]
Mean $\pm$ S.D.	7.67 $\pm$ 2.27	7.42 $\pm$ 2.54
Difference (99% CI)	0.26 (-0.31, 0.82) mm ²	
P-value	0.08	

Not all calcium is created equal

- Severe calcification - same same, but different
- Upfront implementation versus escalation
- Assess Ca^{++} through IVI

Rethinking severe calcium

JACC: CARDIOVASCULAR INTERVENTIONS

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VOL. 17, NO. 10, 2024

EXPERT TOPIC REVIEW

Calcified Nodule in Percutaneous Coronary Intervention

Therapeutic Challenges



Doosup Shin, MD,^{a,*} Keyvan Karimi Galougahi, MD, PhD,^{a,*} James C. Spratt, MBSB, MD,^b Akiko Maehara, MD,^{c,d} Carlos Collet, MD, PhD,^e Emanuele Barbato, MD, PhD,^f Flavio L. Ribichini, MD,^g Nieves Gonzalo, MD, PhD,^h Koshiro Sakai, MD, PhD,^{a,e} Gary S. Mintz, MD,^c Gregg W. Stone, MD,ⁱ Evan Shlofmitz, DO,^a Richard A. Shlofmitz, MD,^a Allen Jeremias, MD, MSc,^{a,c} Ziad A. Ali, MD, DPHIL^{a,c,j}

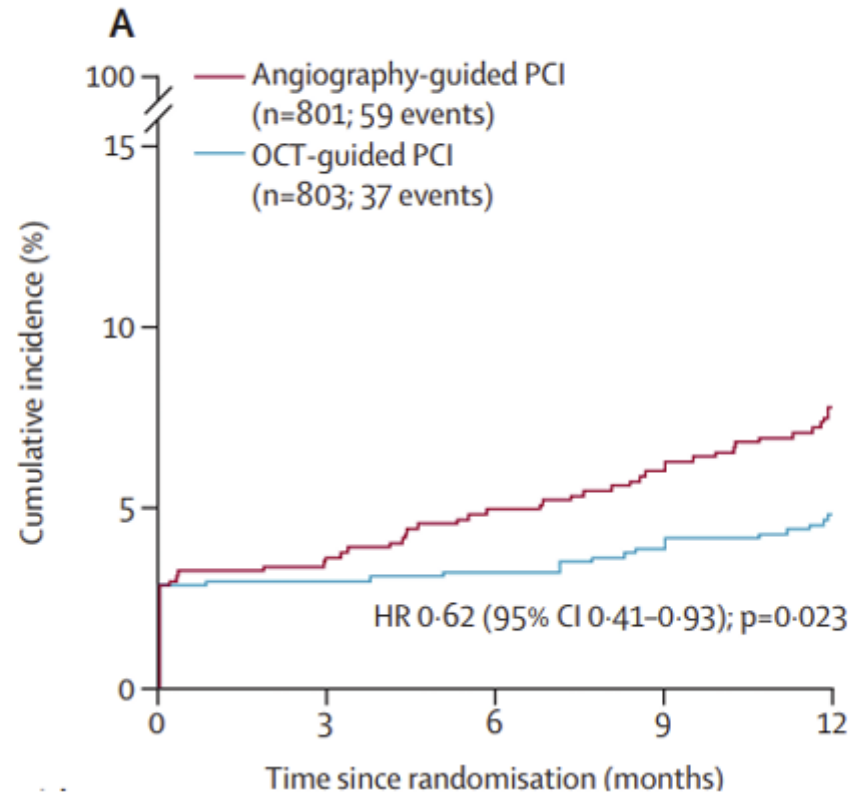
J Am Coll Cardiol Interv. 2024 May, 17 (10) 1187–1199



Imaging
(*archi*typal tragic hero)

Imaging is necessary in complex PCI

OCCUPI



Lancet 2024; 404: 1029–39

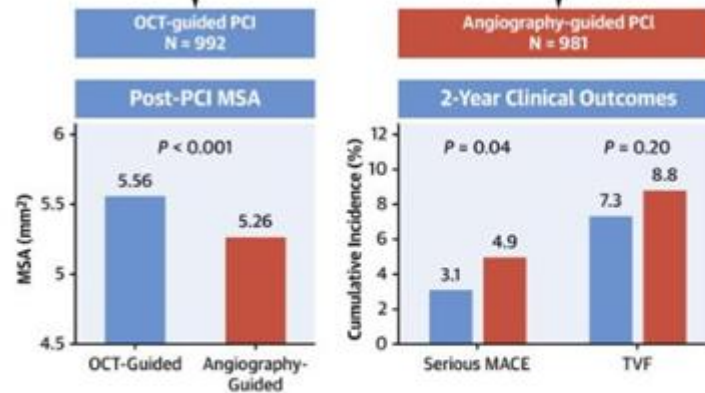
Imaging – Superiority Complex

ILUMIEN IV- substudy

CENTRAL ILLUSTRATION: Optical Coherence Tomography-Guided vs Angiography-Guided Percutaneous Coronary Intervention in Complex Lesions: An ILUMIEN IV Substudy

1,973 Patients With Complex Lesions in ILUMIEN IV: OPTIMAL PCI

1. Long or multiple lesion (stent ≥ 28 mm)
2. 2-stent bifurcation lesion
3. Severely calcified lesion
4. Chronic total occlusion
5. In-stent restenosis



Ali ZA, et al. J Am Coll Cardiol. 2024;84(4):368-378.

JACC 2024; 84(4):368-78

Imaging is necessary but not sufficient

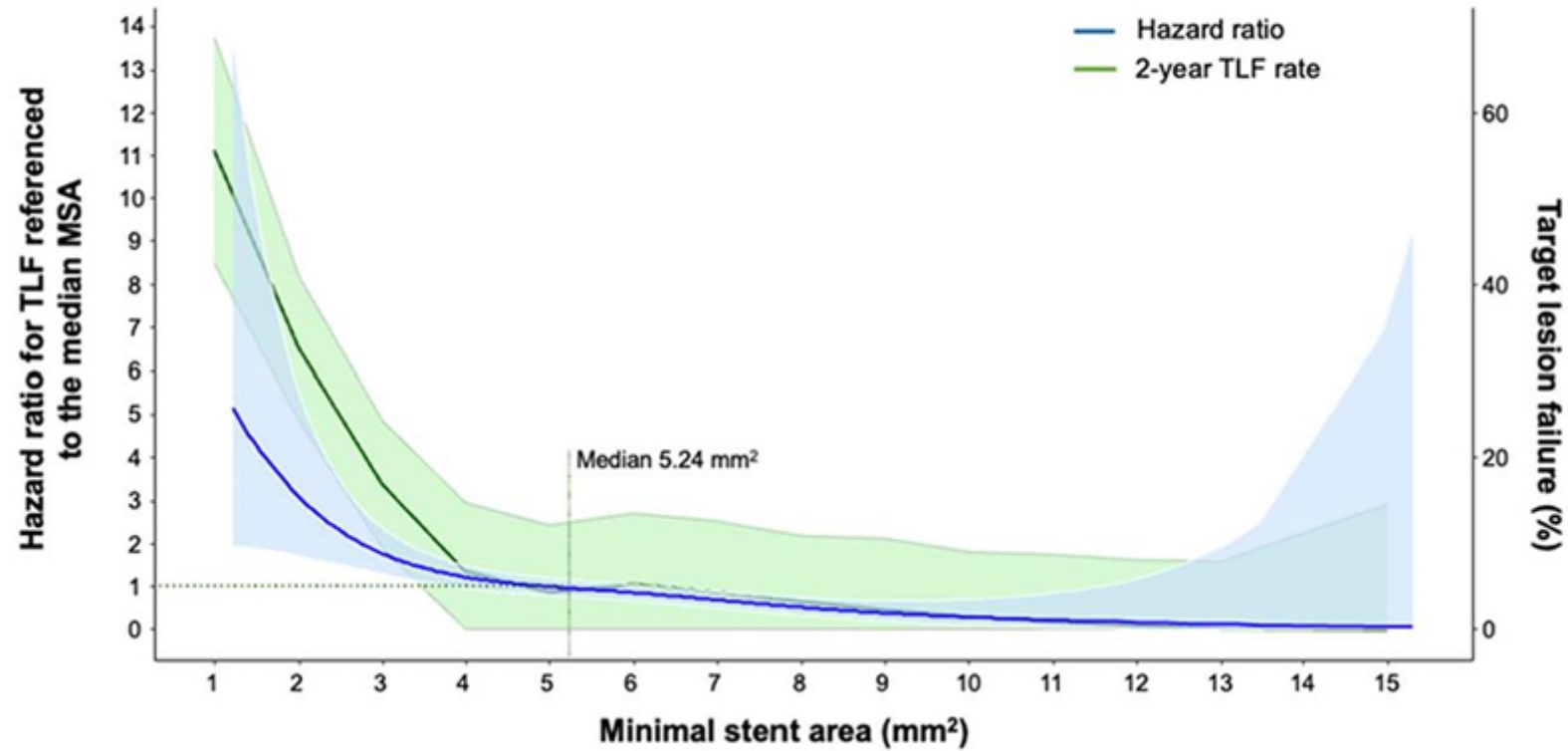
Table 6 Optical coherence tomography findings independently associated with clinical endpoints (adjusted analysis)

Outcome	N	OCT variable	Hazard ratio (95% CI)	P-value
Target lesion failure	1997	Minimal stent area, per 1 mm ²	0.76 (0.68–0.86)	<.0001
		Proximal edge dissection, any	1.77 (1.20–2.62)	.004
Cardiac death or TV-MI	1997	Stent length, per 5 mm	0.70 (0.70–0.95)	.009
		Stent length, per 5 mm	1.08 (1.02–1.15)	.009
Ischaemia-driven TLR	1997	Intra-stent flow area, per 1 mm ²	0.72 (0.62–0.84)	<.0001
		Proximal edge dissection, any	1.88 (1.16–3.03)	.01
		Plaque or thrombus protrusion, major	1.95 (0.97–3.92)	.06
Stent thrombosis	2128	Minimal stent expansion, per 10%	0.71 (0.55–0.93)	.01

N, the number of patients included in each analysis model.

CI, confidence interval; OCT, optical coherence tomography; ref, reference; TLR, target lesion revascularization; TV-MI, target vessel myocardial infarction.

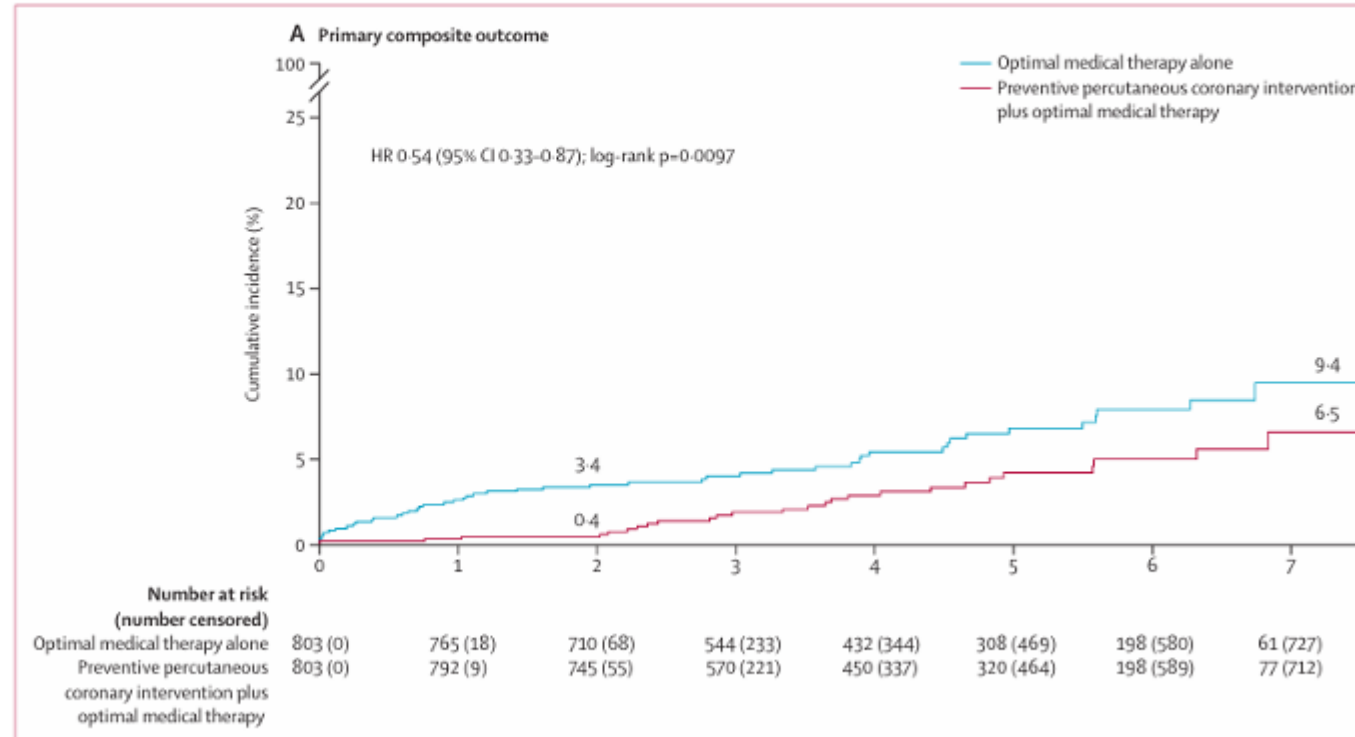
What is good enough?



European Heart Journal (2024) 45, 4630–4643

Reassessing definition of “complete”

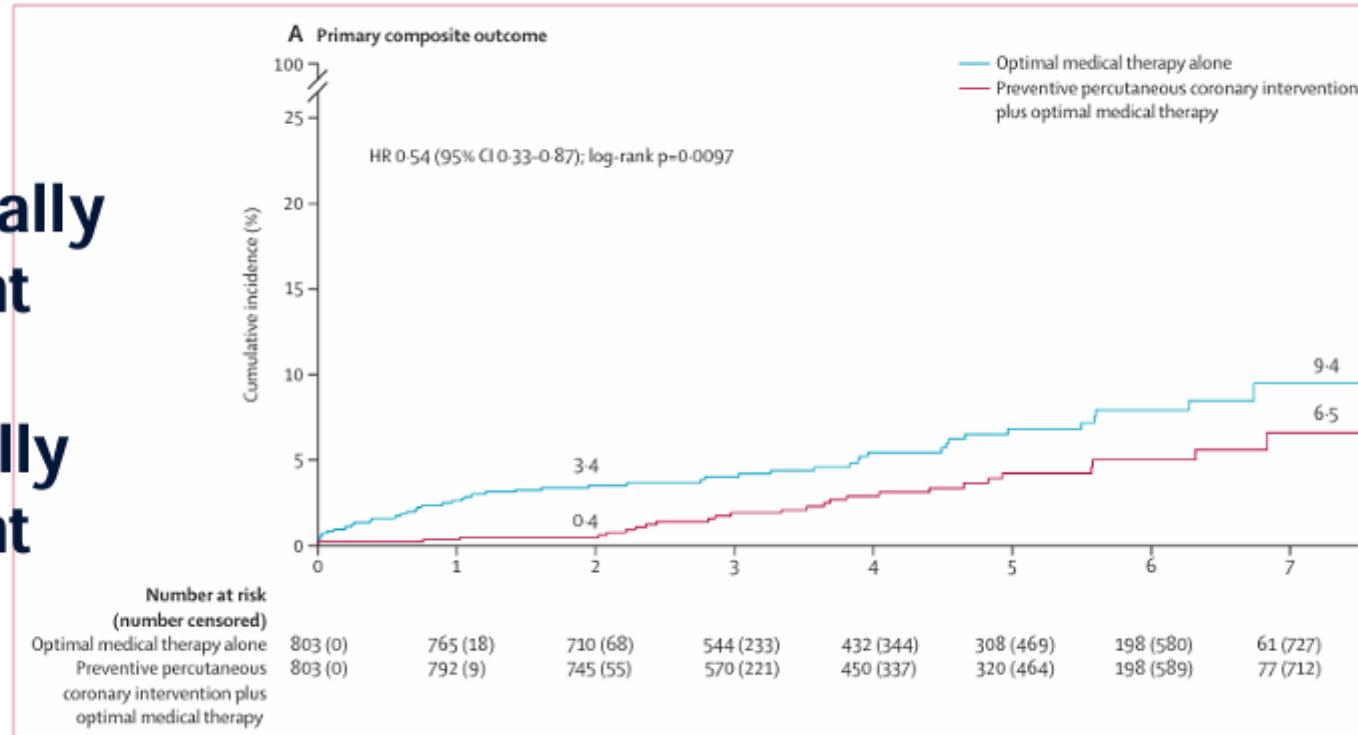
PREVENT

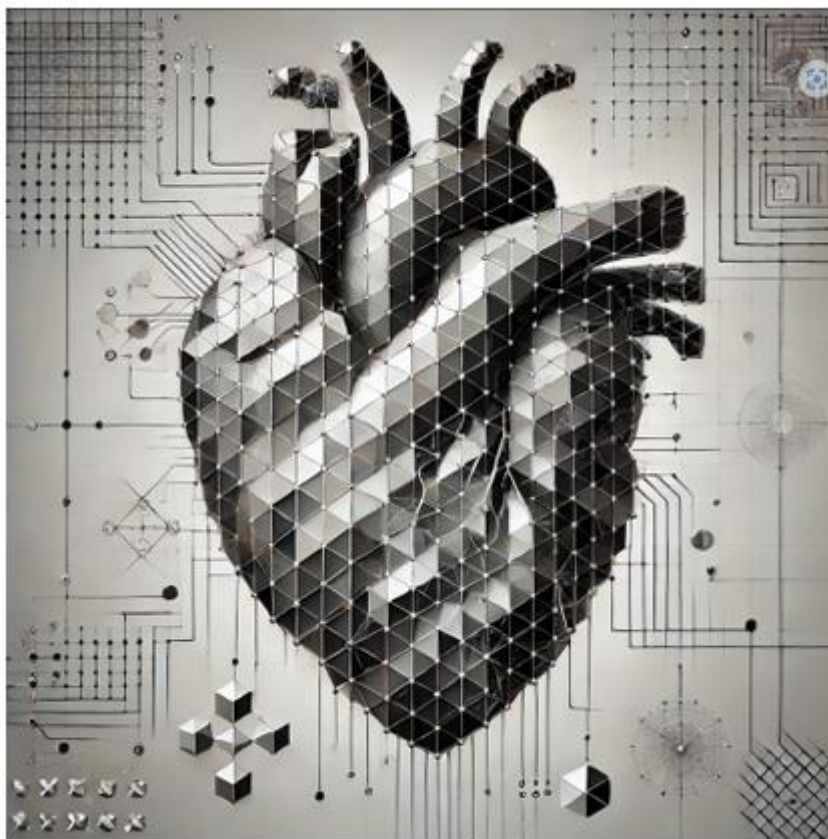


PREVENT. Lancet. 403(10438):1753-1765, 2024

Reassessing definition of “complete”

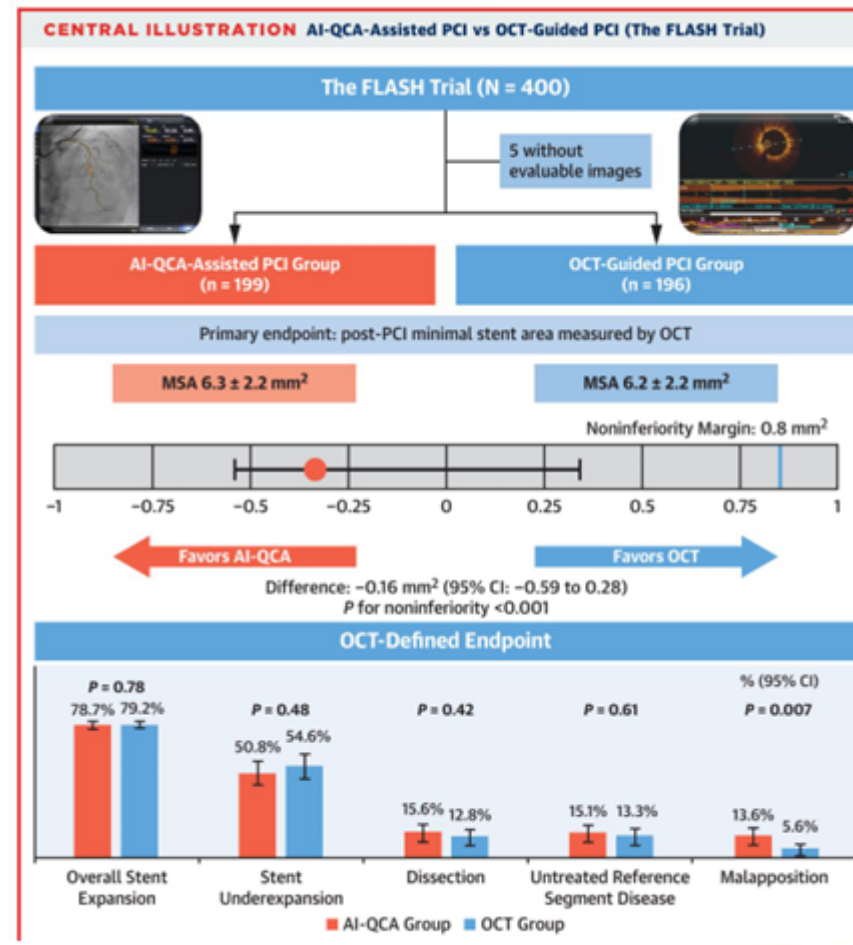
Not
physiologically
significant
≠
Not clinically
significant





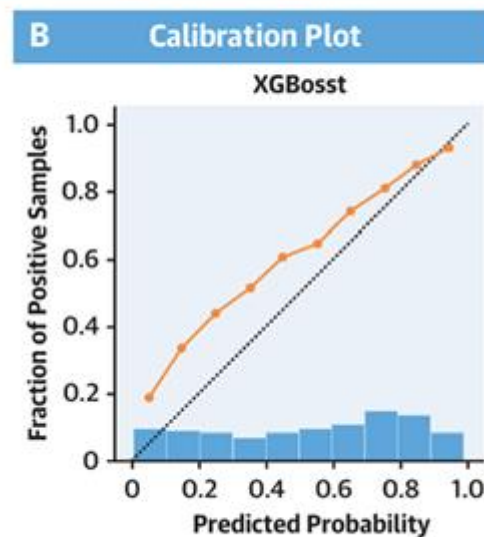
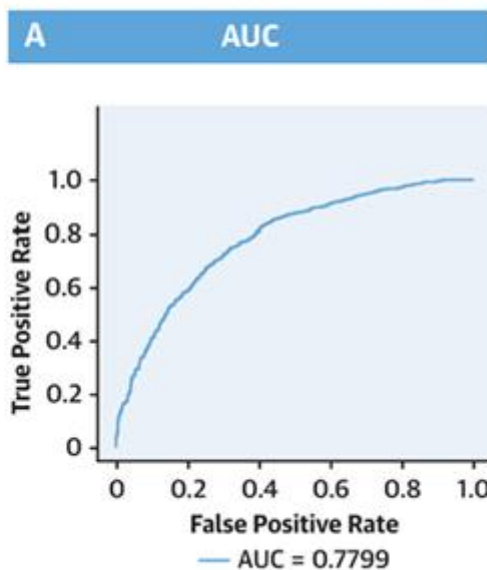
AI: the hype is real

FLASH: AI versus OCT:



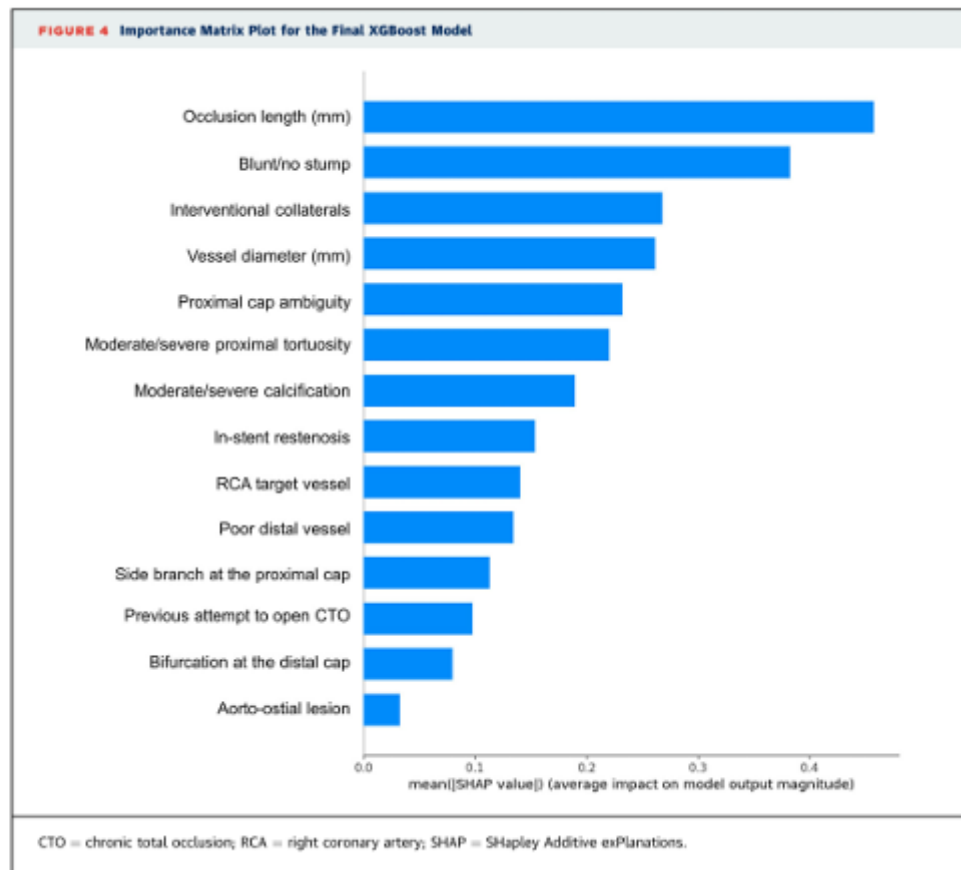
Antegrade Crossing Success

PROGRESS-AW: A 14-Feature Machine Learning Prognostic Model for Successful CTO Crossing Using Primary Antegrade Wiring



JACC: Cardiovascular Interventions 2024. 17(14):1707-1716

Antegrade Crossing Success



The year 0 AD in CHIP

- MCS can be lifesaving in the right patient
- Calcium modification escalation may be reasonable
- **Catheterization & Cardiovascular Interventions. 104(5):918-927, 2024**
- Meet PCI optimization targets
- Get acquainted with AI
- Stay humble

HydroDynamic contrast Recanalization (HDR): Description of a new crossing technique for coronary chronic total occlusions

Mauro Carlino MD¹  | Angelo Nascimbene MD² |
Emmanouil S. Brilakis MD, PhD³  | Akshitha Yarrabothula MD² |
Antonio Colombo MD⁴ | Sunao Nakamura MD⁵  |
Lorenzo Azzalini MD, PhD, MSc⁶  | Bashir Hanif MD⁷ | M. Bilal Iqbal MD, PhD⁸ |
Salman A. Arain MD² 

C Knuckle Guidewires to Create Dissections in Chronic Total Occlusion Percutaneous Coronary Intervention Position Statement



Stéphane Rinfret, MD, SM,^a Glen A. Henry, MD,^a Jaikirshan J. Khatri, MD,^b Kambis Mashayekhi, MD, PhD,^{c,d}
Khaldoon Alaswad, MD,^e Lorenzo Azzalini, MD, PhD, MSc,^f Luiz F. Ybarra, MD, PhD, MBA,^g
Ram Vijayaraghavan, MD,^{h,i} Jarrod D. Frizzell, MD,^j Alexandre Avran, MD,^k Margaret B. McEntegart, MD,^l
William L. Lombardi, MD,^f J. Aaron Grantham, MD,^m Emmanouil Brilakis, MDⁿ

