Chronic Occlusion: When and Why to perform angioplasty?

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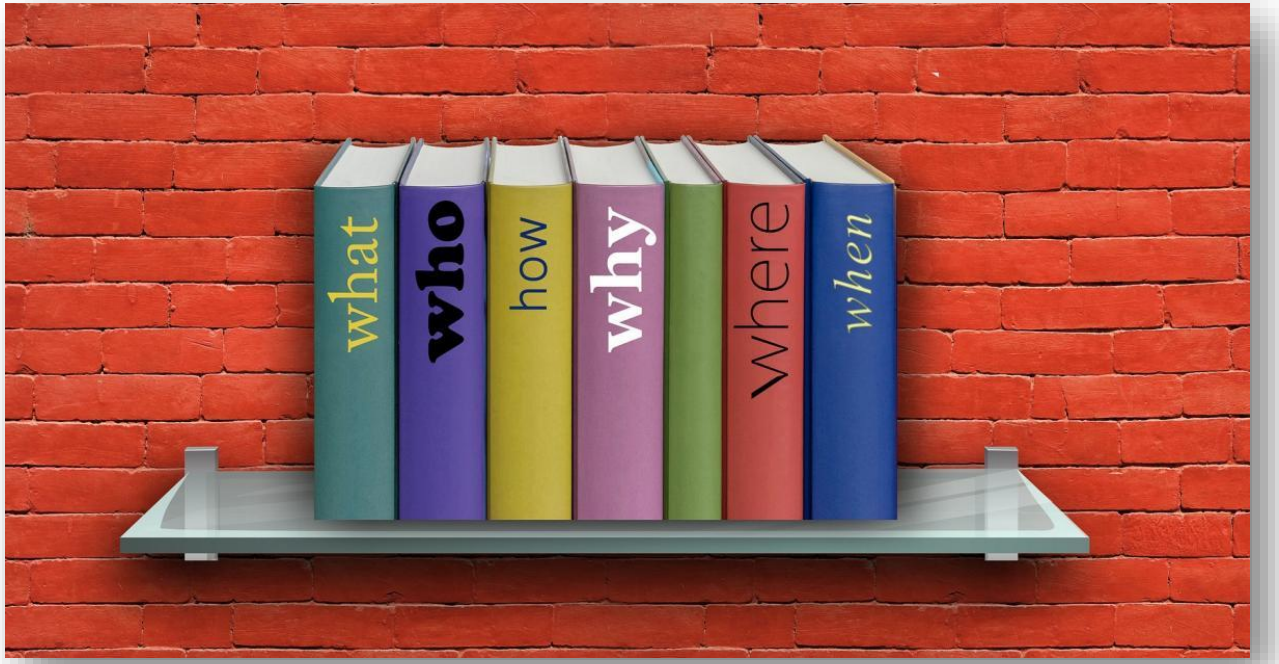
WHY ?

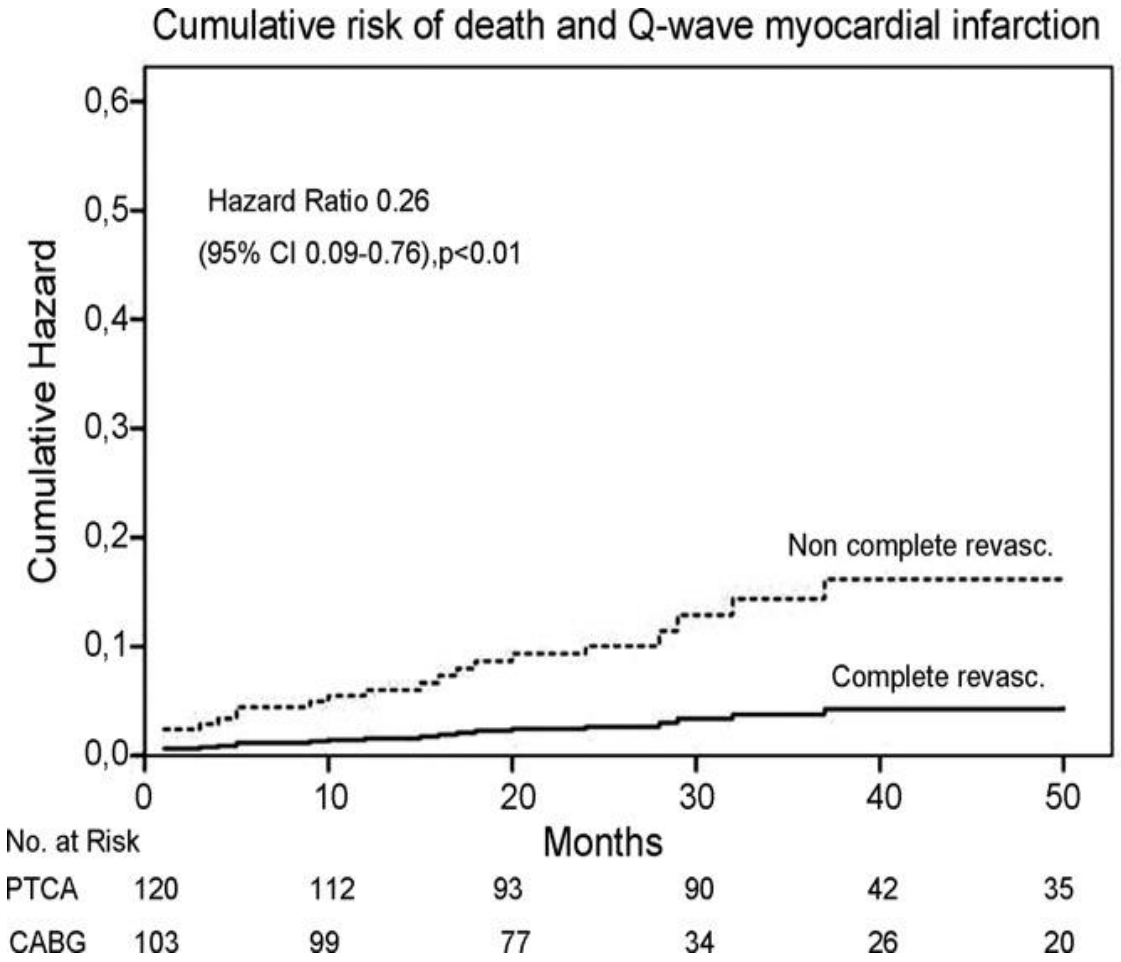


Why We Should Try to Reopen CTO's

- ✓ To follow the surgical dogma of complete revascularization?

Revascularization strategy in patients with MVD and a major vessel chronically occluded; from the CABRI trial

Complete revascularization impacts on prognosis

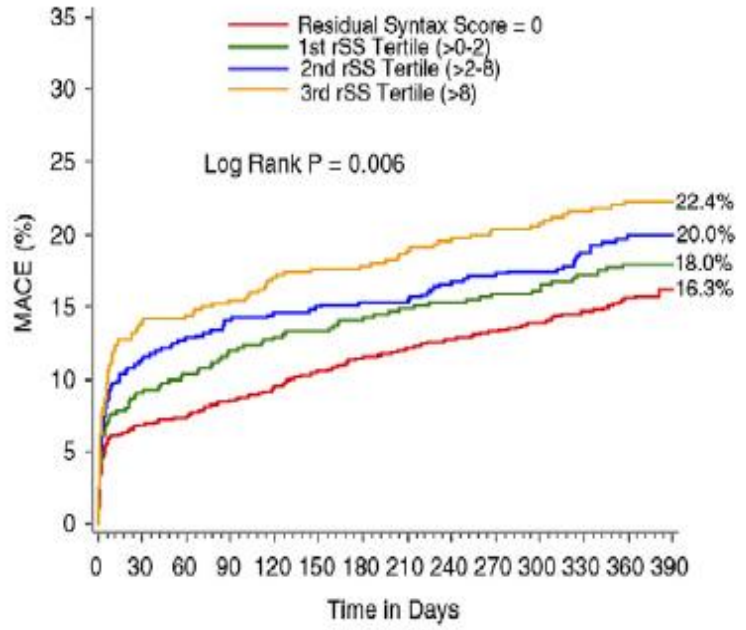


Martuscelli Eur J Cardiothorac Surg 2008;33:4-8

“Residual Syntax Score”, a new predictor of outcomes

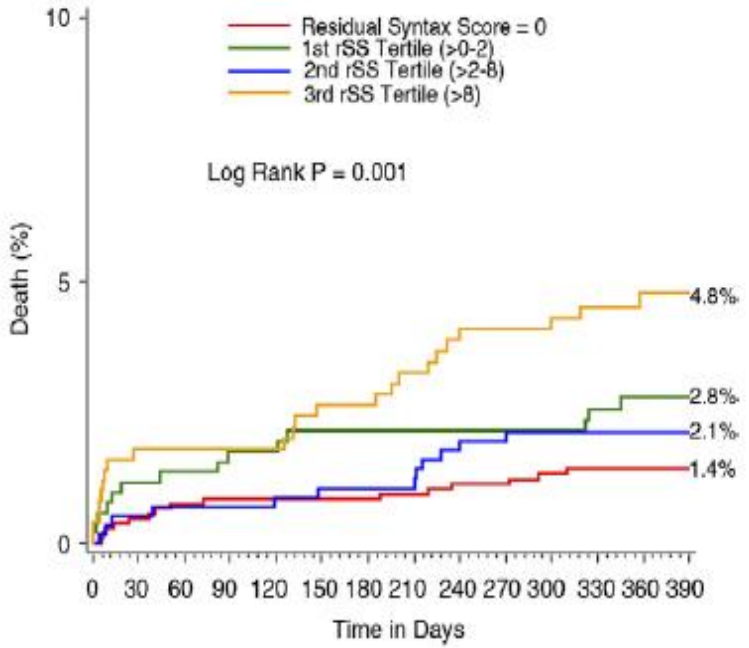
Relation between residual Syntax score and MACEs

A



Number at Risk:					
rSS = 0	1084	966	931	909	649
1st rSS Tertile	523	445	433	422	304
2nd rSS Tertile	578	482	474	463	330
3rd rSS Tertile	501	408	396	382	275

B



Number at Risk:					
rSS = 0	1084	1047	1044	1038	756
1st rSS Tertile	523	494	490	488	355
2nd rSS Tertile	578	558	555	549	408
3rd rSS Tertile	501	473	469	460	330

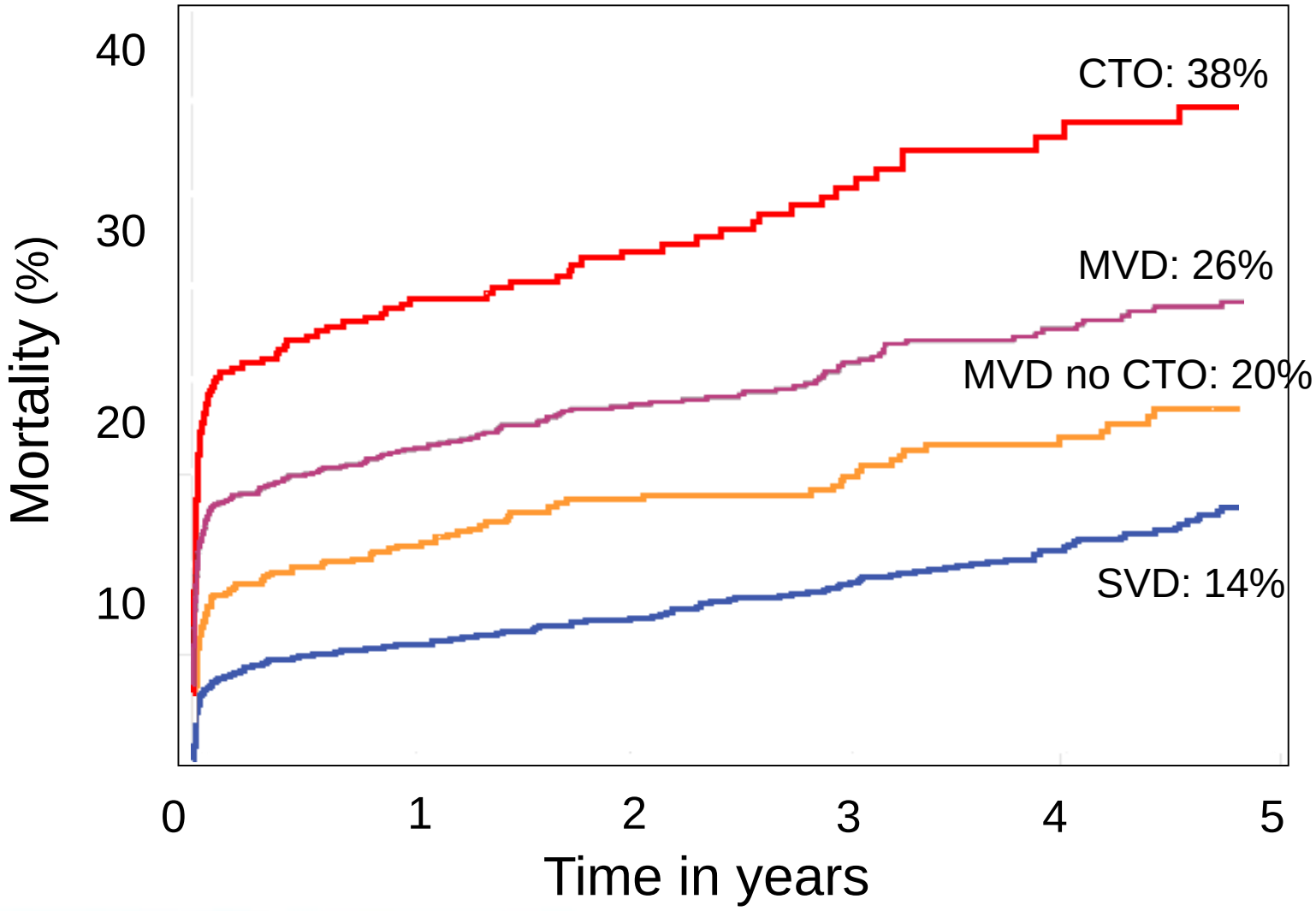
Genereux et al. JACC 2012; 59: 2165-74

Why We Should Try to Reopen CTO's

- ✓ To follow the surgical dogma of complete revascularization?
- ✓ To improve survival and prevent hard events ?

Impact of a CTO in STEMI (n=3277)

In STEMI pts CTO and MVD impacts on Prognosis



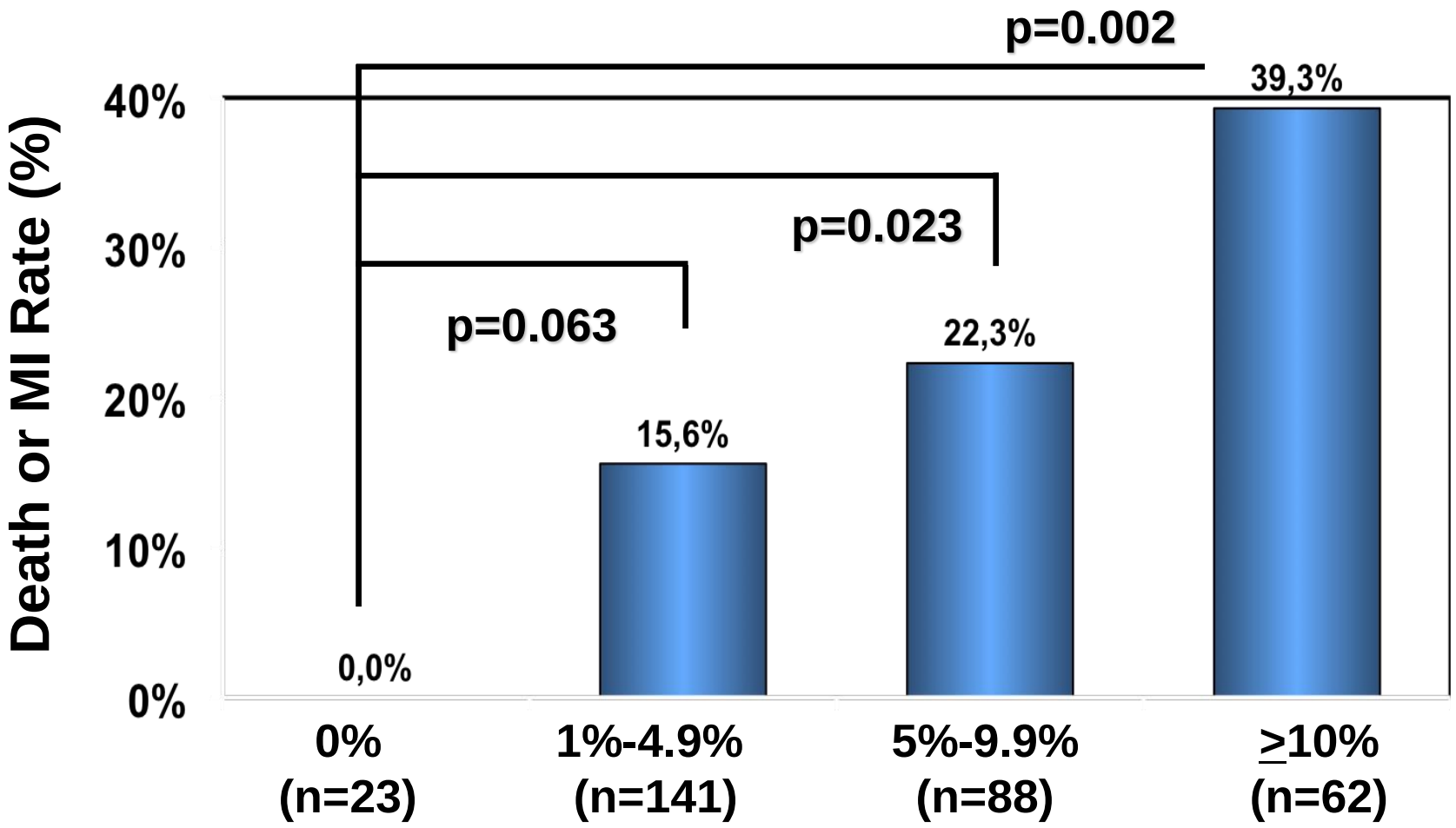
Claessen, van der Schaaf, Henriques et al, AHA 2008

Why We Should Try to Reopen CTO's

- ✓ To follow the surgical dogma of complete revascularization?
- ✓ To improve survival and prevent hard events ?
- ✓ To treat symptoms and/or ischemia ?
- ✓ To improve left ventricular function ?

COURAGE:Treating Ischemia Reduces Death and MI: Outcomes and Residual Ischemia with "OMT"

Death and MI are correlated to ischemia extension



Shaw for the COURAGE investigators Circ 2008 :117

jaa
Just accepted article

EuroIntervention

Title: **Percutaneous Recanalization of Chronic Total Occlusions: 2019 Consensus Document from the EuroCTO Club.**

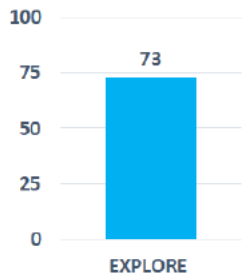
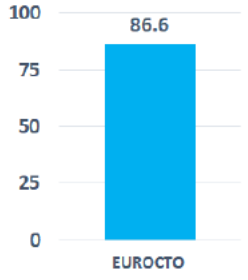
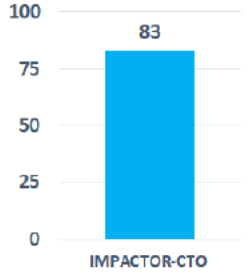
Percutaneous Recanalization of Chronic Total Occlusions: 2019 Consensus Document from the EuroCTO Club.

Alfredo R Galassi **MD**[1], Gerald S Werner **MD, PhD**[2], Marouane Boukhris **MD**[3], Lorenzo Azzalini **MD, PhD, MSc**[4], Kambis Mashayekhi **MD**[5], Mauro Carlino **MD**[4], Alexandre Avran **MD**[6], Nikolaos V Konstantinidis **MD, MSc**[7], Luca Grancini **MD**[8], Leszek Bryniarski **MD, PhD**[9], Roberto Garbo **MD**[10], Nenad Bozinovic **MD**[11], Antony H Gershlick **MD**[12], Sudhir Rathore **MD**[13], Carlo Di Mario **MD, PhD**[14], Yves Louvard **MD**[15], Nicolaus Reifart **MD, PhD**[16], Georgios Sianos **MD, PhD**[7]; **on behalf of the EuroCTO Club**.

jaa Just accepted article

EuroIntervention

Title: **Percutaneous Recanalization of Chronic Total Occlusions: 2019 Consensus Document from the EuroCTO Club.**

	EXPLORE	EUROCTO	IMPACTOR-CTO
Success Rate			
Positive/Negative RCT			
Major Findings			

	PCI	OMT
MACE	No difference	
QoL	N/A	
Ischemia reduction	N/A	
LVEF and LVEDV	No difference	
	PCI of a CTO located in the LAD may improve LVEF and clinical outcome	

	PCI	OMT
MACE	No difference	
QoL	Better	
Ischemia reduction	N/A	
LVEF and LVEDV	N/A	

	PCI	OMT
MACE	No difference	
QoL	Better	
Ischemia reduction	Better	
LVEF and LVEDV	N/A	

Crystal Clear Indication

Summary for a good indication to improve symptomes, QoL and LEVF

- ✓ Diastolic wall thickness > 7 mm
- ✓ Transmural extent of infarction < 50%
- ✓ Ischemic myocardium > 10%

Why We Should Try to Reopen CTO's

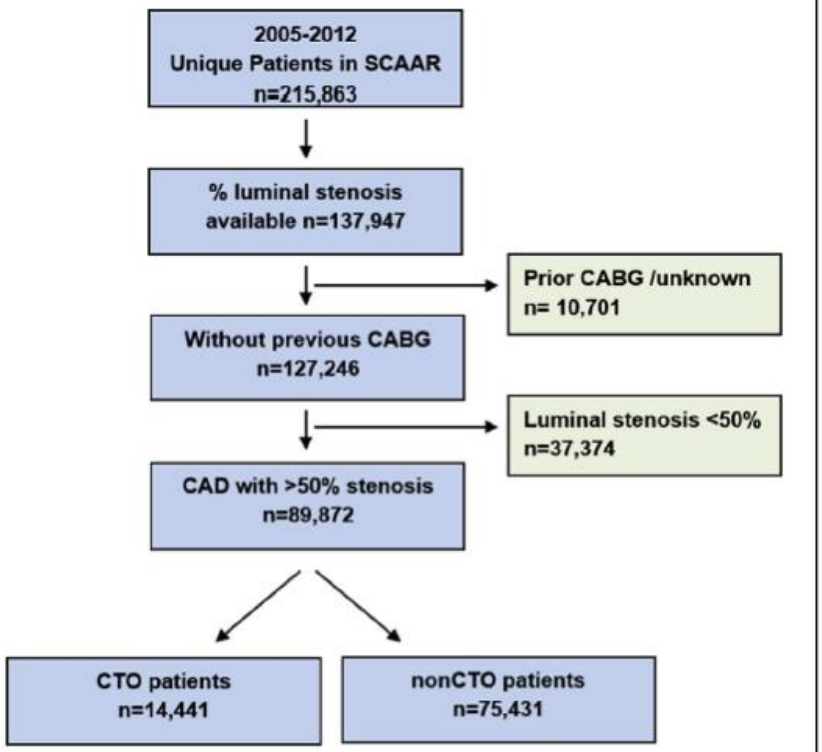
- ✓ To follow the surgical dogma of complete revascularization?
- ✓ To improve survival and prevent hard events ?
- ✓ To treat symptoms and/or ischemia ?
- ✓ To improve left ventricular function ?
- ✓ To improve prognosis ?

Prognostic Impact of Chronic Total Occlusions

A Report From SCAAR (Swedish Coronary Angiography and Angioplasty Registry)

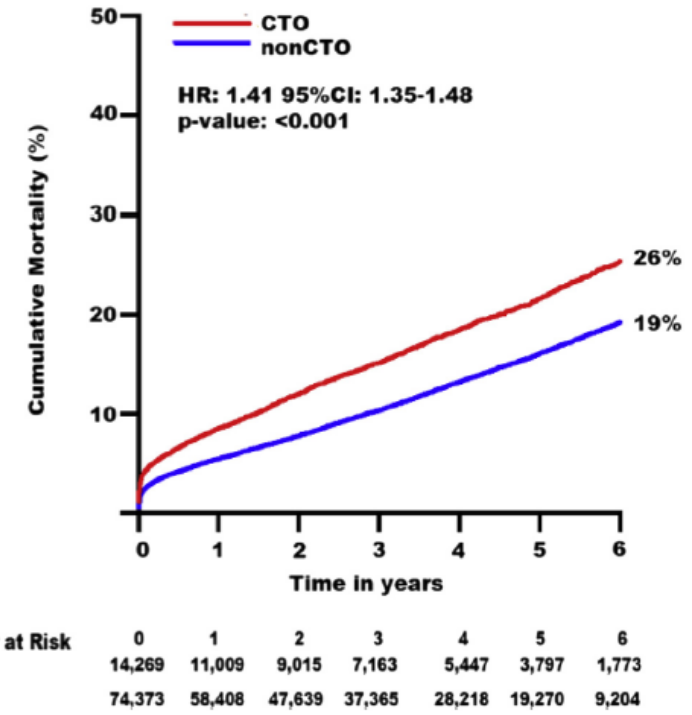
In a large unselected population

FIGURE 1 Flowchart for Patient Inclusion



CABG = coronary artery bypass grafting; CAD = coronary artery disease; CTO = chronic total occlusion; SCAAR = Swedish Coronary Angiography and Angioplasty Registry.

FIGURE 2 Crude Kaplan-Meier Curves for Long-Term Mortality in Patients With and Those Without Chronic Total Occlusion in the Swedish Coronary Angiography and Angioplasty Registry



Number at Risk	0	1	2	3	4	5	6
CTO	14,269	11,009	9,015	7,163	5,447	3,797	1,773
non CTO	74,373	58,408	47,639	37,365	28,218	19,270	9,204

CI = confidence interval; CTO = chronic total occlusion; HR = hazard ratio.

T. Ramunddal *et al*. J Am Coll Cardiol Intv 2016;9:1535–44

Prognostic Impact of Chronic Total Occlusions

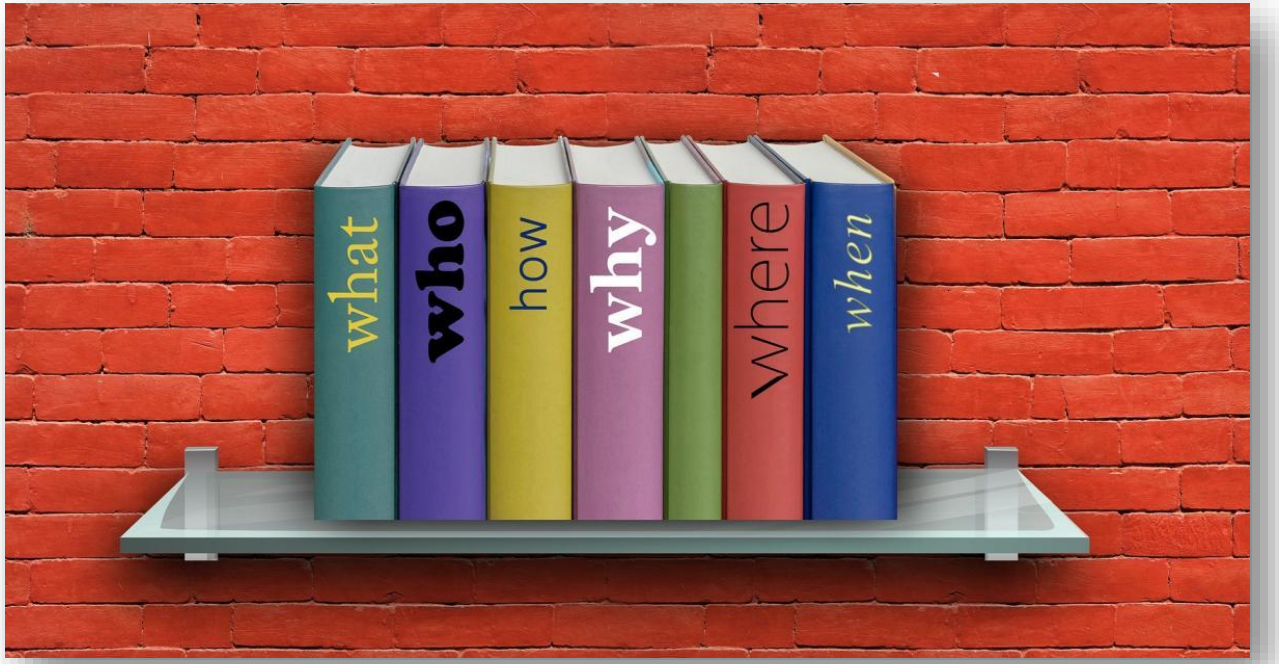
A Report From SCAAR (Swedish Coronary Angiography and Angioplasty Registry)

In a large unselected population
Impact of CTO opening

FIGURE 5 Crude Kaplan-Meier Curves for Long-Term Mortality in Patients With Chronic Total Occlusion After Successful Versus Failed Percutaneous Coronary Intervention

T. Ramunddal *et al*. J Am Coll Cardiol Intv 2016;9:1535–44

WHEN ?



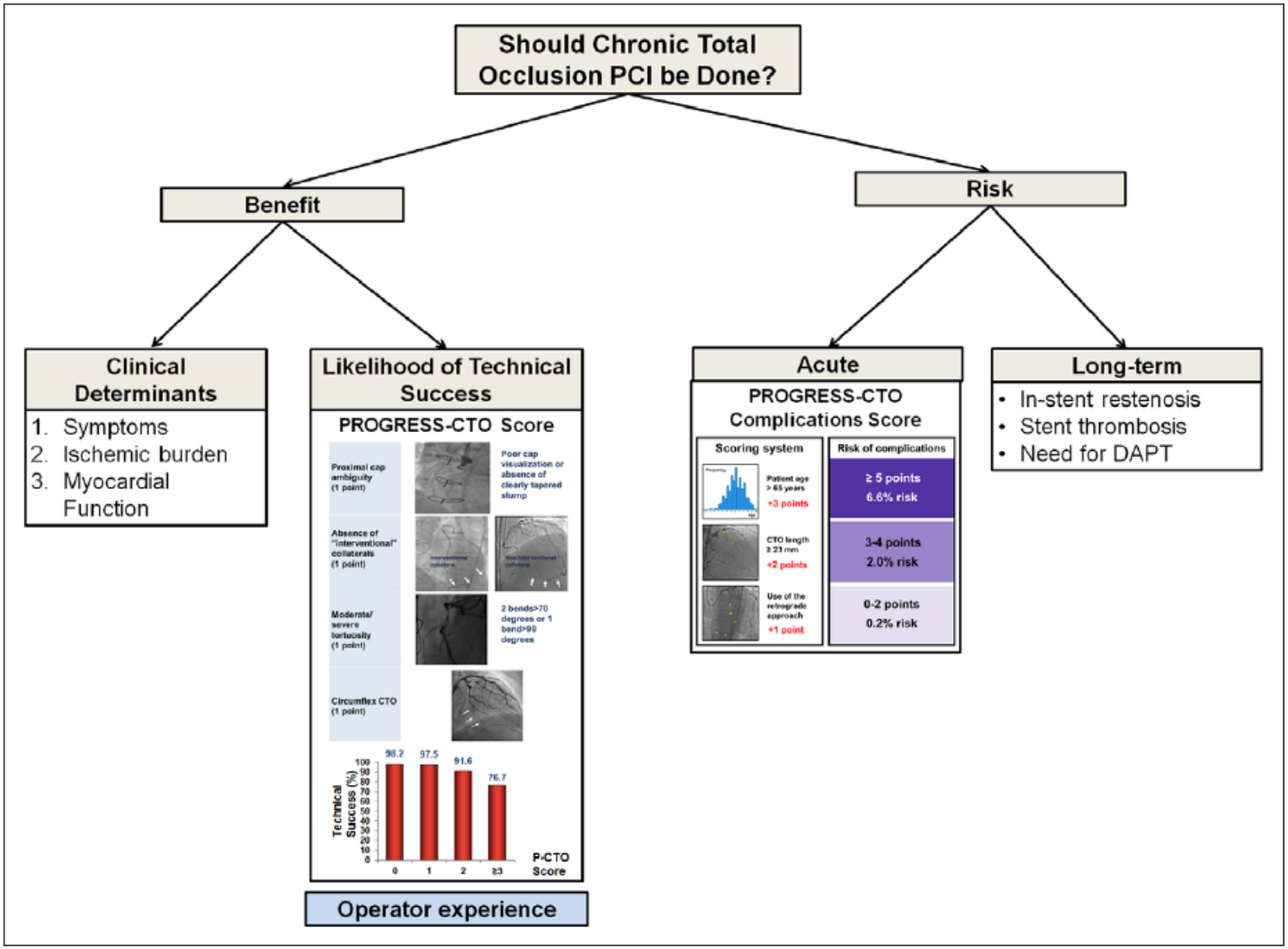


Figure. Overview of the potential risks and benefits of CTO PCI.
CTO indicates chronic total occlusion; DAPT, dual antiplatelet therapy; PCI, percutaneous coronary intervention; and PROGRESS- CTO, Prospective Global Registry for the Study of Chronic Total Occlusion Intervention.[15,16] Reproduced from Brilakis[17] with permission. Copyright © 2017, Elsevier.

WHEN YOU ARE READY?

- Selection
- Material
- Technique
- Experience

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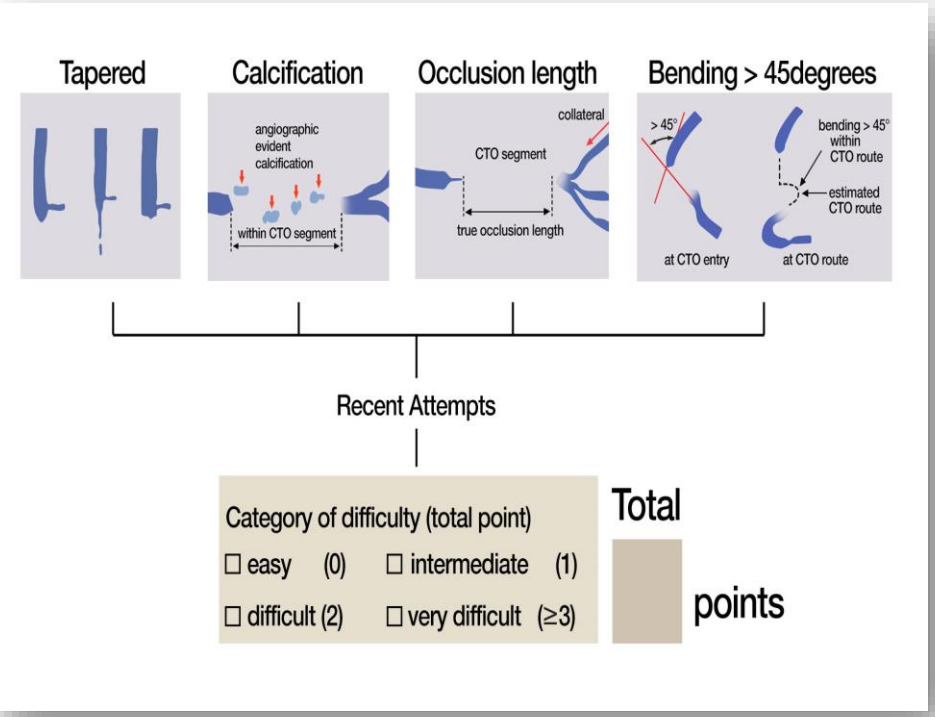
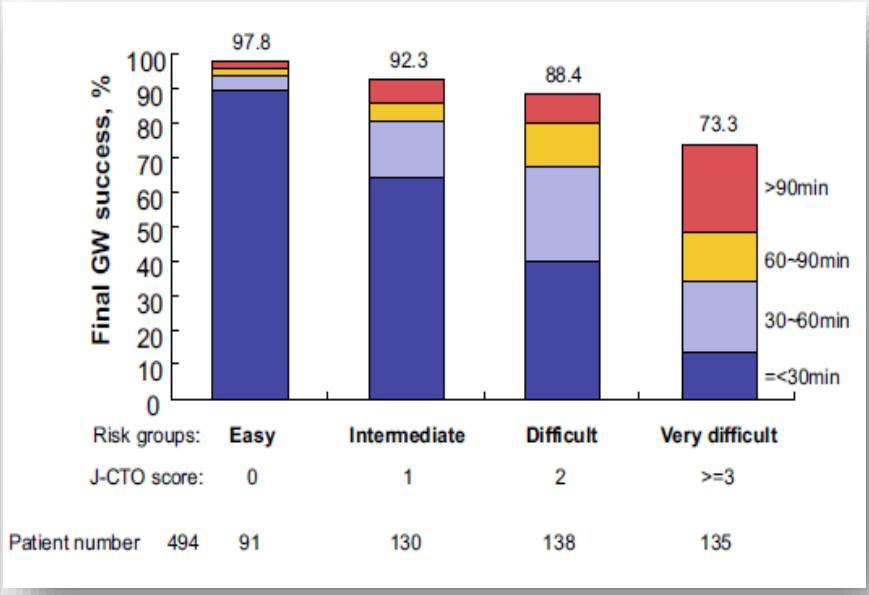
WHEN YOU ARE READY?
- Selection
- Material
- Technique
- Experience

PATIENT SELECTION

Complexity evaluation



Guidewire Crossing < 30 min.



Morino et al. JACC Interv 2011; 4: 213-221

WHEN YOU ARE READY?
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- Technique
- Experience

Material for CTO PCI

1. Guiding catheters
2. Guide wires (Dedicated)
3. Microcatheters (Dedicated)
4. Balloon catheters (Dedicated)
5. Stents (DES)
6. Others (Rota…)
7. For complications (kit pericardio…stent graft…)

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WHEN YOU ARE READY?
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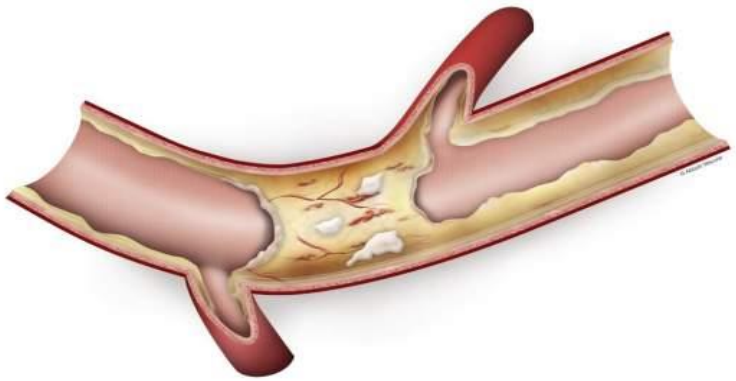
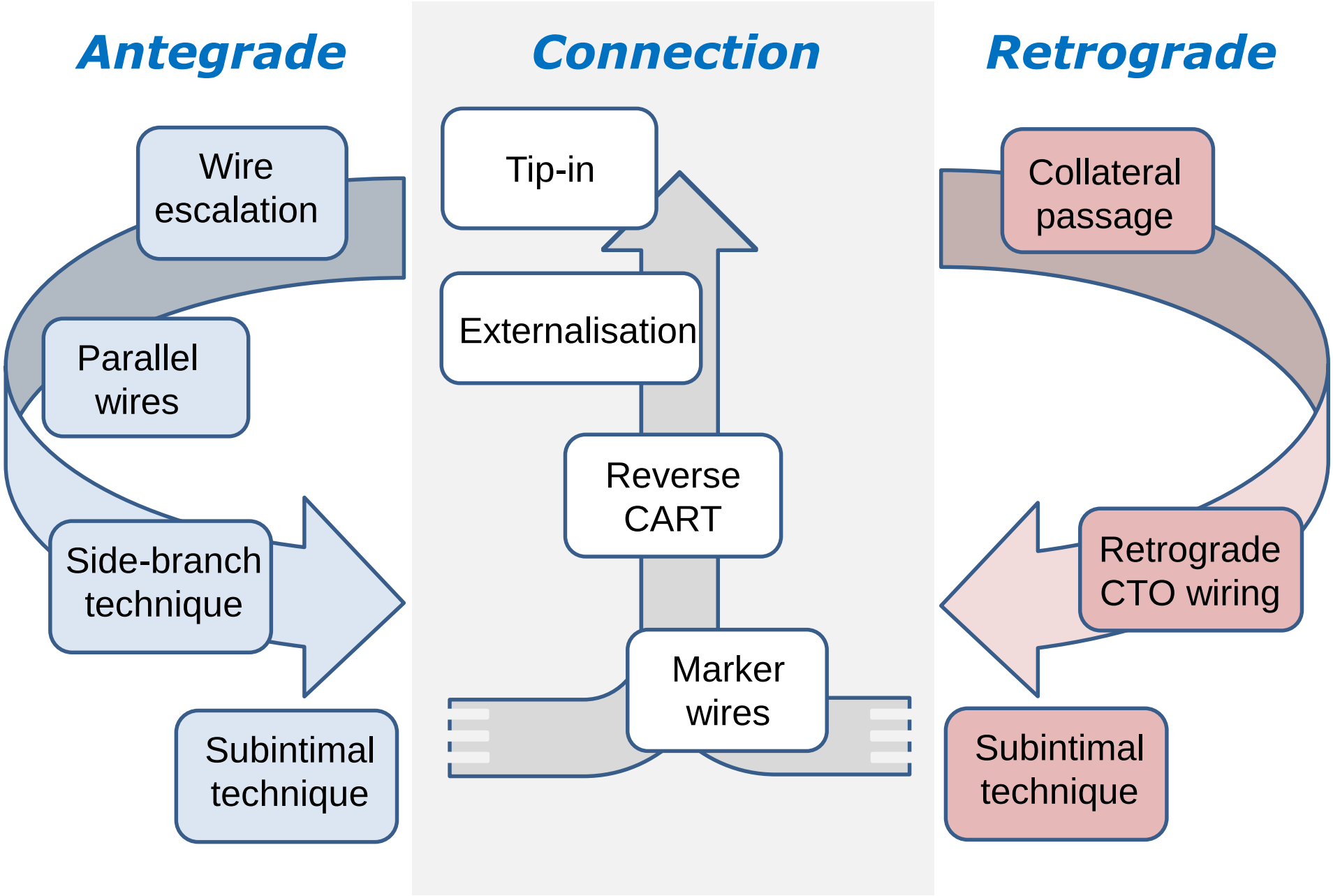
CTO EYE

To define the strategy



- ✓ Is it a CTO ?
- ✓ Proximal and distal ambiguity ?
- ✓ Lesion length ?
- ✓ Vessel course, Island ?
- ✓ Lesion calcification and tortuosity ?
- ✓ Distal run off ?
- ✓ Collaterals ?


Antegrade
Connection
Retrograde
Wire escalation
Parallel wires
Side-branch technique
Subintimal technique
Tip-in
Externalisation
Reverse CART
Marker wires
Collateral passage
Retrograde CTO wiring
Subintimal technique

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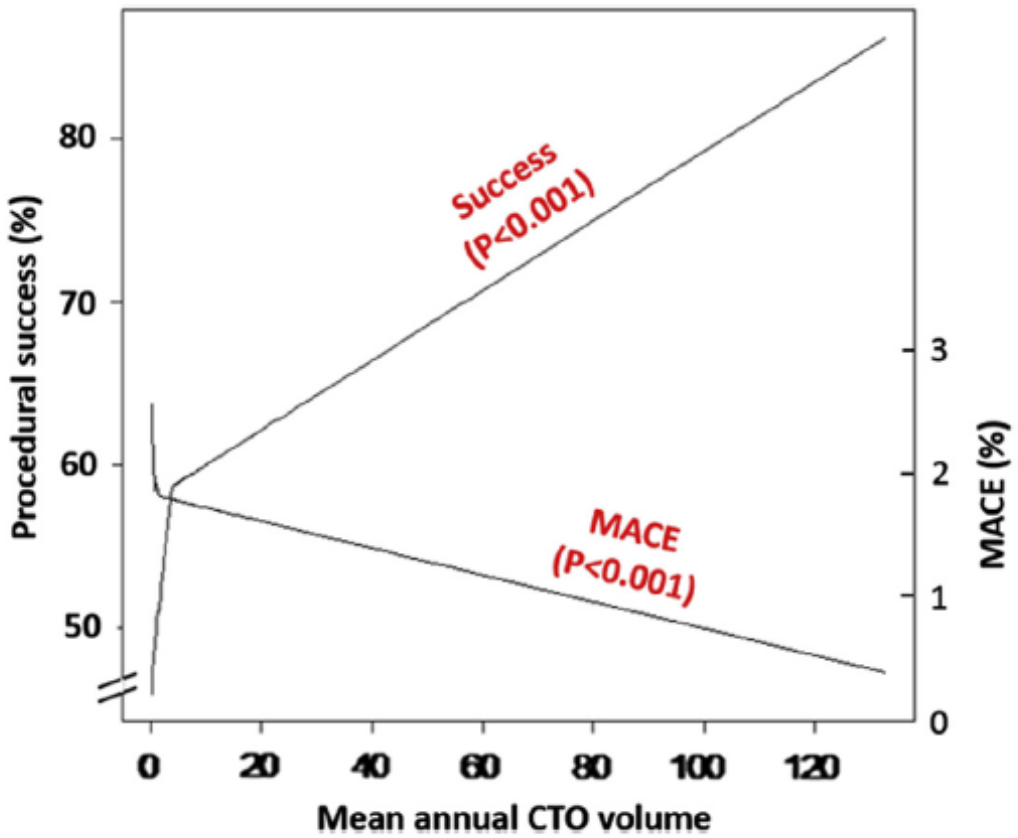
WHEN YOU ARE READY?
Selection
Material
Technique
Experience

Procedural Outcomes of Chronic To Percutaneo

A Report From th

Increase succes nber of pts/y.

FIGURE 4 Operator CTO PCI Volume Association With Procedural Success and Complications



Procedural success and major adverse cardiac event (MACE) rates as a function of annual operator chronic total occlusion percutaneous coronary (CTO PCI) volume.

TABLE 3 Pr

Outcome	CI Volume p Value
Procedural su	<0.001
MACE	0.050

Values are n (%

Abbreviations

E. Brilakis *et al*. J Am Coll Cardiol Intv 2015;8:245–53

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WHEN YOU ARE READY?
- Selection
- Material
- Technique
- Experience

Conclusions

- ✓ Successful PCI of CTO's improves **symptoms**, **ischemia,** and **left ventricular function**,
- ✓ Reduces need for **CABG** and may improve **survival**.
- ✓ The net **benefit** is strongly related to the **amount of myocardial ischemia**.
- ✓ **The balance between benefit** (amount of ischemia) **and risk** should always be assessed before taking the decision.
- ✓ **Experience** and **learning** are very important