



CTO/CHIP Toolbox and Technique: What Is Trend and New in 2018?

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Conflict of interest



- I, Gerald S. Werner, MD, have the following conflict of interest to declare with regard to the following presentation:
 - Speaker fees for Abbott Vascular, ASAHI, Boston Scientific, IMDS, Orbus-Neich, Terumo



What you need to treat a CTO (complex lesion)



- Guiding catheters
- Microcatheters
- Guide wires
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- Balloon catheters
- Guideliner/Guidezilla
- Rotablator (Laser)
- Stents
- IVUS
- Hemodynamic support



Radial access increasing even in CTO PCI



Radial to the LCA – Femoral to the RCA



Controlled (CTO) wiring requires a dedicated microcatheter

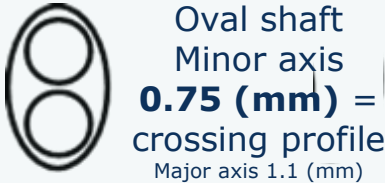



- Microcatheter selection:
 - **Finecross**: sleek profile, hard tip
 - **Corsair**: provides additional support for the guide
 - **Caravel**: sleek profile with tapered tip
 - Others to mention: Nhancer, Turnpike (Spiral)

Dual lumen catheter frequently used

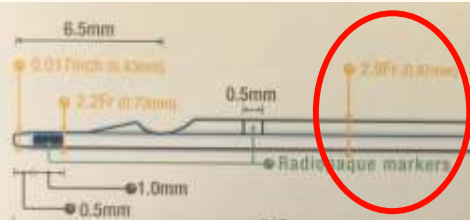
Crossing profile comparison of dual lumen micro catheters

NHANCER RX
Current design dated 2016






FineDuo
Multifunctional Dual Lumen Microcatheter

Crusade
Current design dated 2011

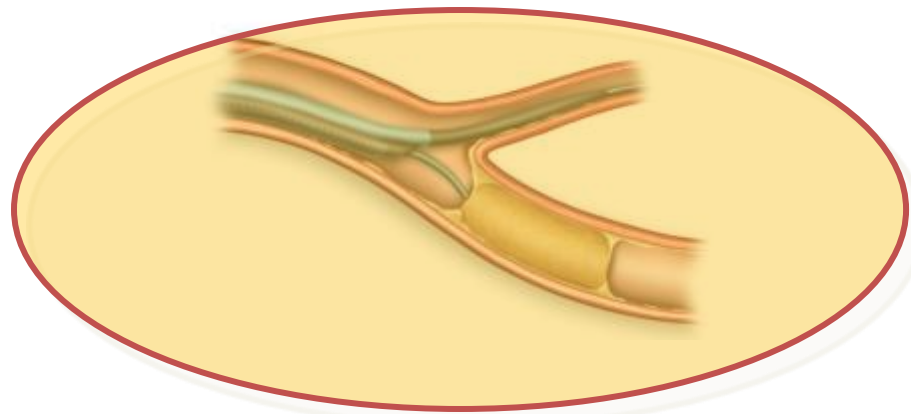
Twin-Pass TORQUE
dual access catheter

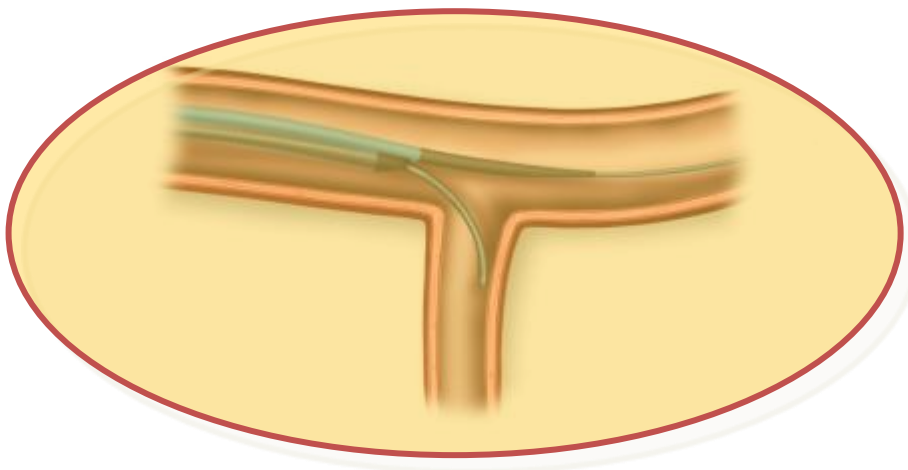
Model	Description	Dual-Lumen O.D.	Distal Tip O.D.
5200	Twin-Pass	3.4F x 2.7F (1.14mm / 0.045" x 0.91mm / 0.036")	2F (0.66mm / 0.026")
5201	Twin-Pass Torque	3.5F x 3.5F (1.17mm / 0.046")	2.1F (0.71mm / 0.028")

Dual lumen applications

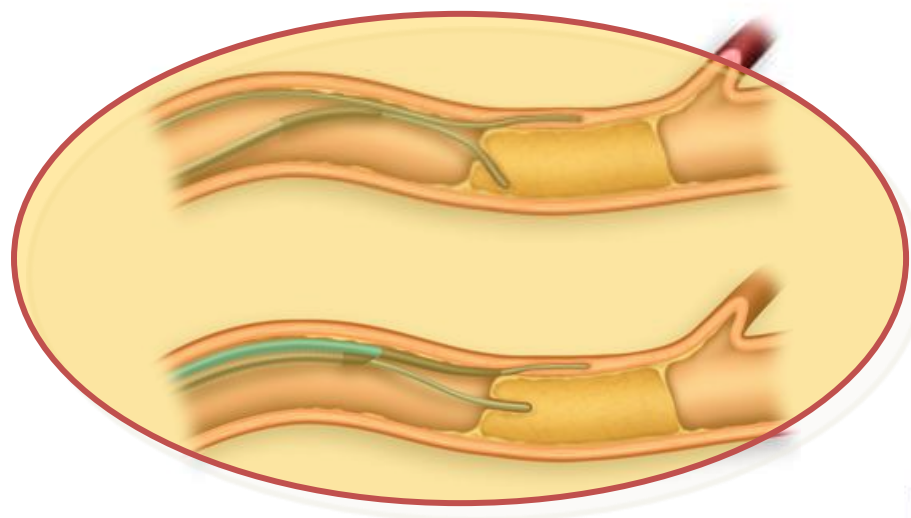
Bifurcation CTO wiring



Wiring acute angulated bifurcations

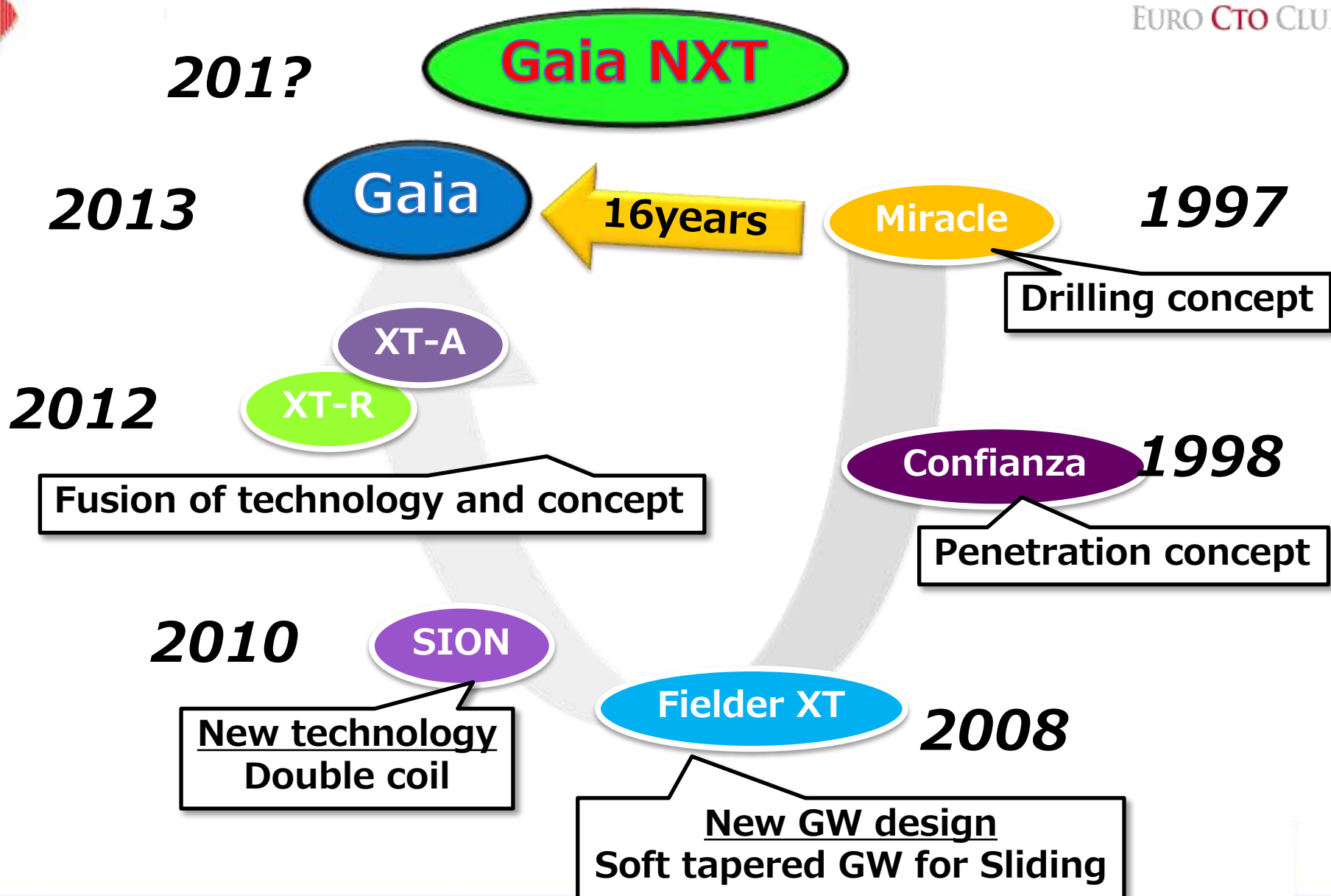


Parallel wiring technique





The (R)evolution of CTO guide wires





Wire selection: what stage which wire



- **Antegrade approach**
 - Fielder XT, XT-A, XT-R
 - Ultimate 3, Miracle 12, Pro 12, Progress 200T, Hornet 14
 - Pilot 200, Gladius
 - Gaia 1, Gaia 2, Gaia 3
- **Collateral approach**
 - Sion, Sion Black, Fielder XT-R, Suoh03
- **Retrograde approach**
 - Gaia 3, Ultimate 3
 - Any antegrade wire



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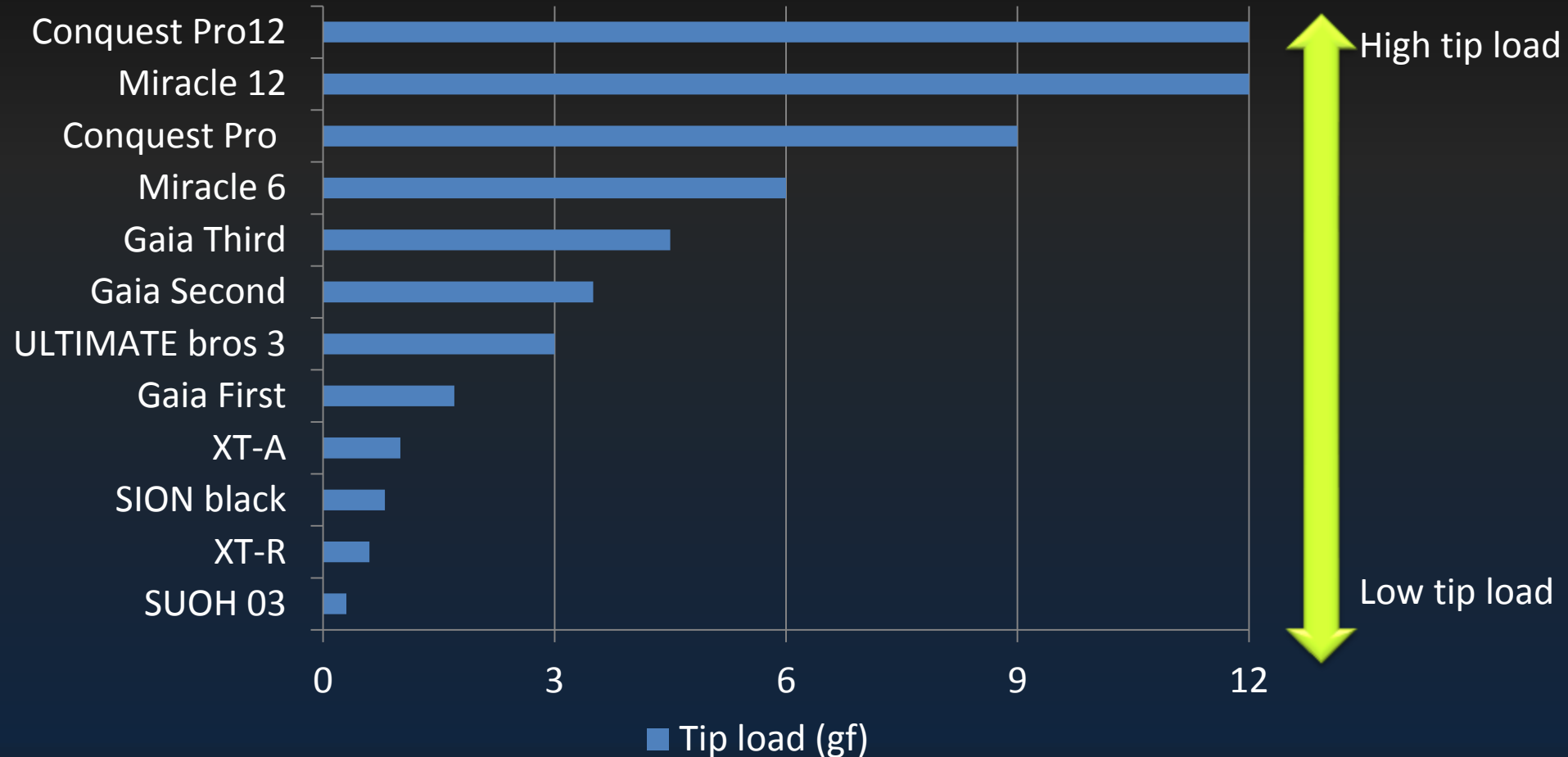
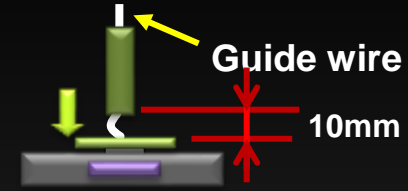
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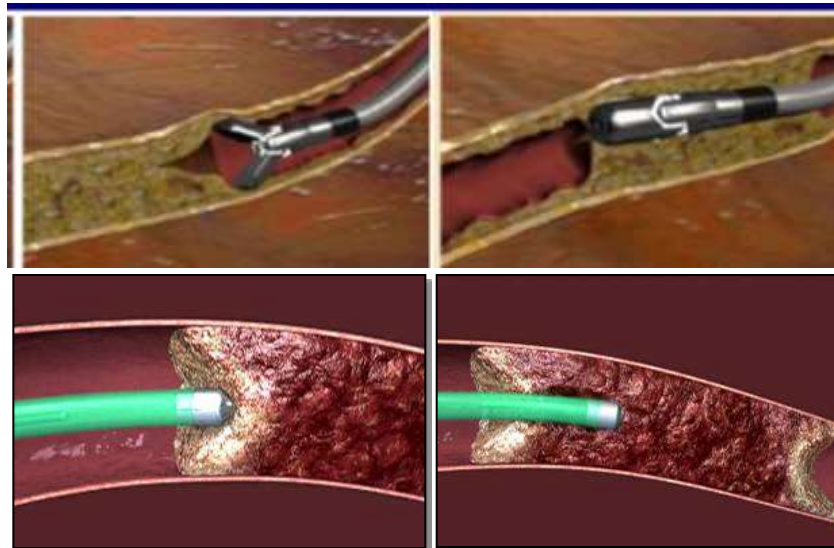
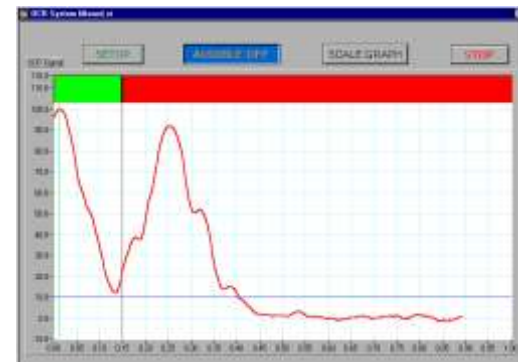
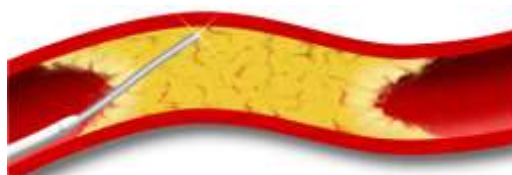
Understanding the characteristics of guide wires

- Tip load

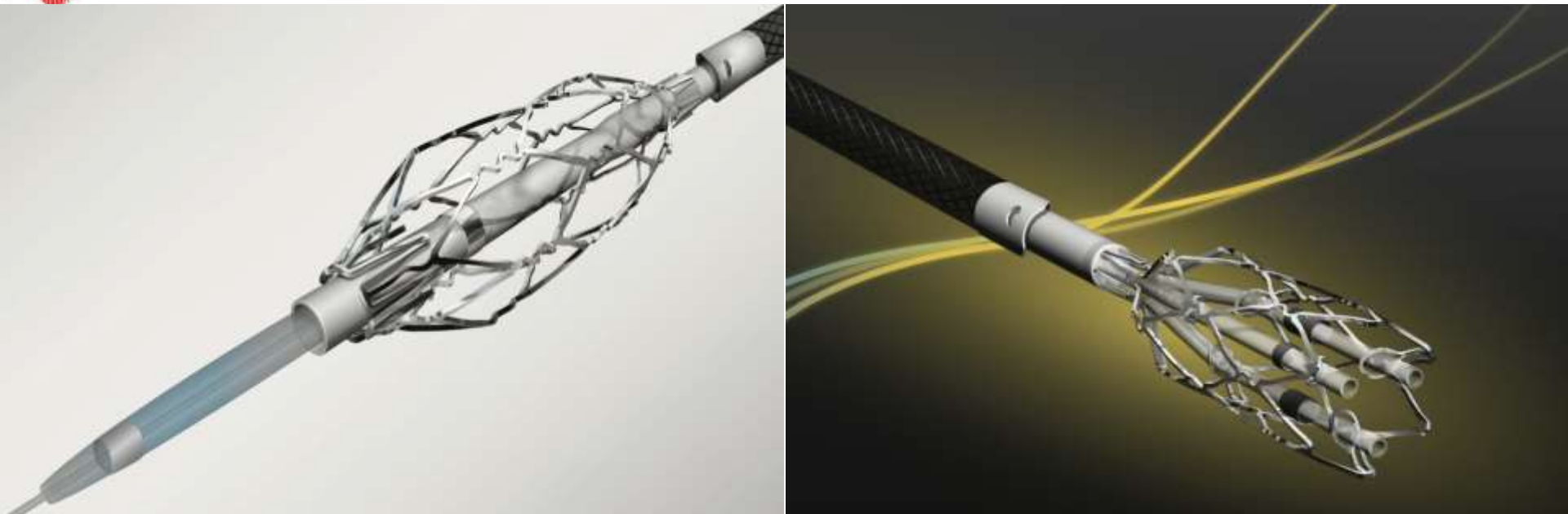


Did new technologies get you through a CTO ?

- Early ideas: Magnum wire, ROTACS
- Safecross
OCR and RF
- Frontrunner
mechanical
- Crosser vibration

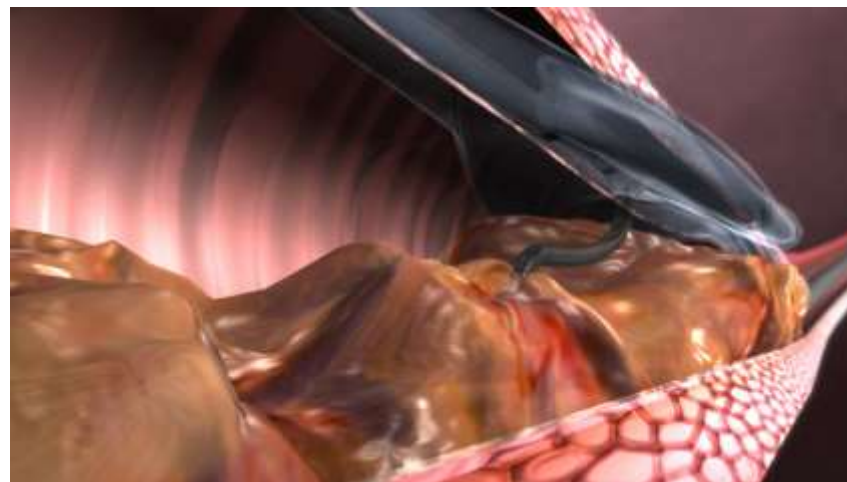
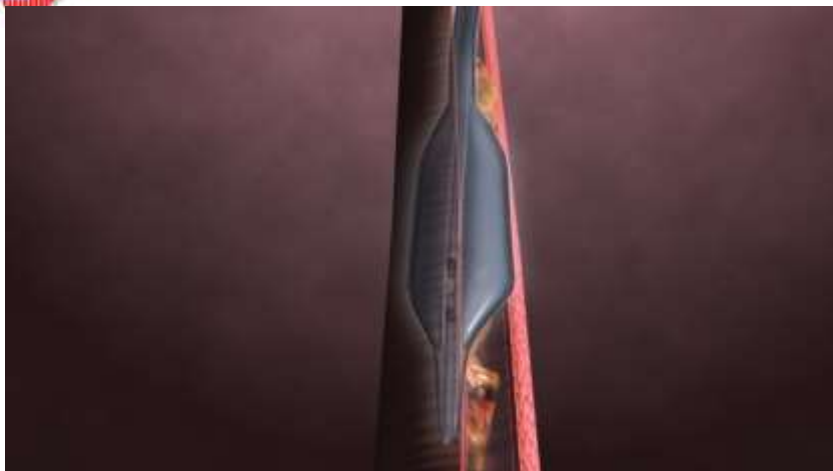


Facilitating the proximal cap penetration



CenterCross and MultiCross Devices

One Device to Stay: StingRay Reentry System





"Collateral Connection Size" (CC)

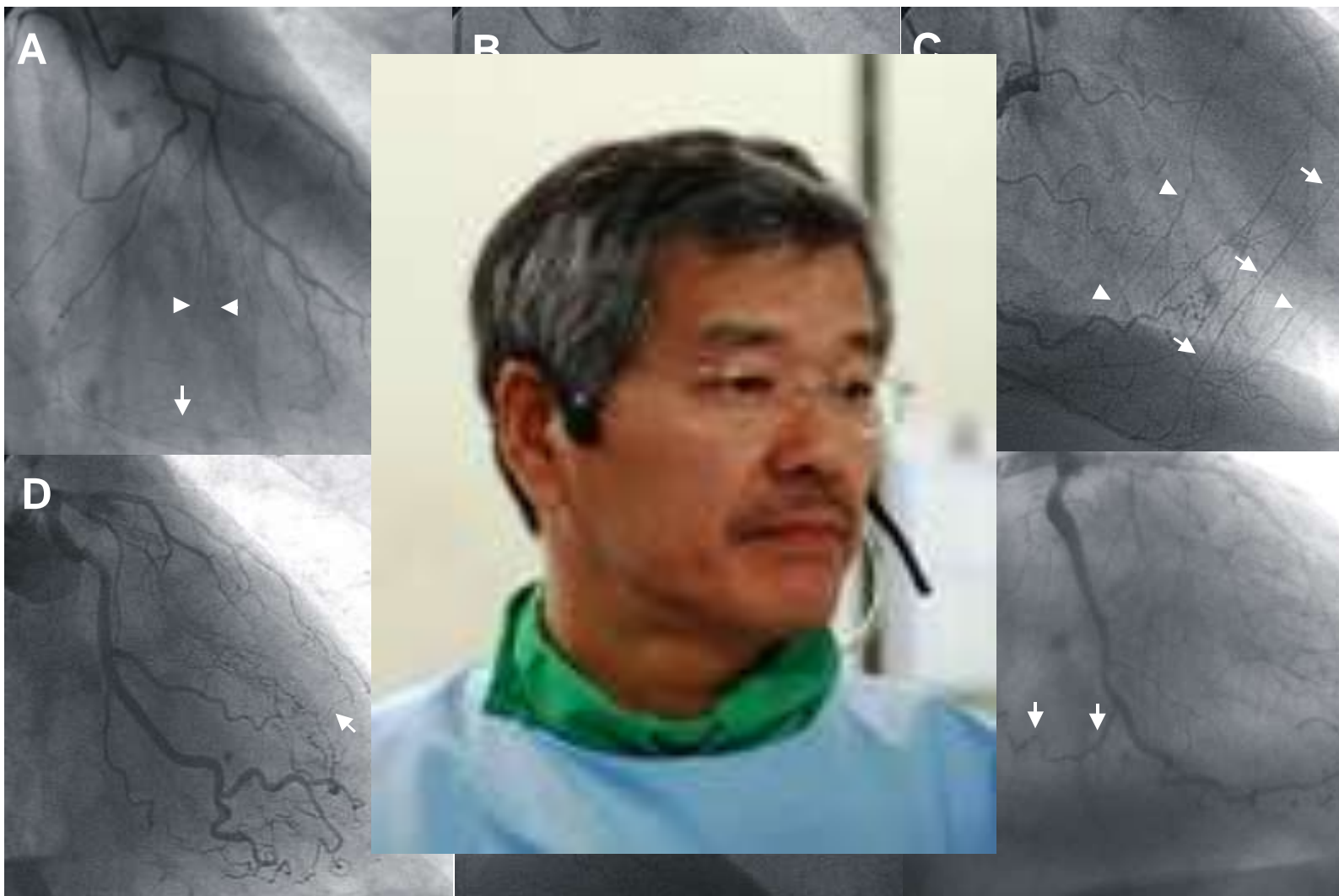
CC0 14%

CC1 51%

CC2 35%



EURO CTO CLUB

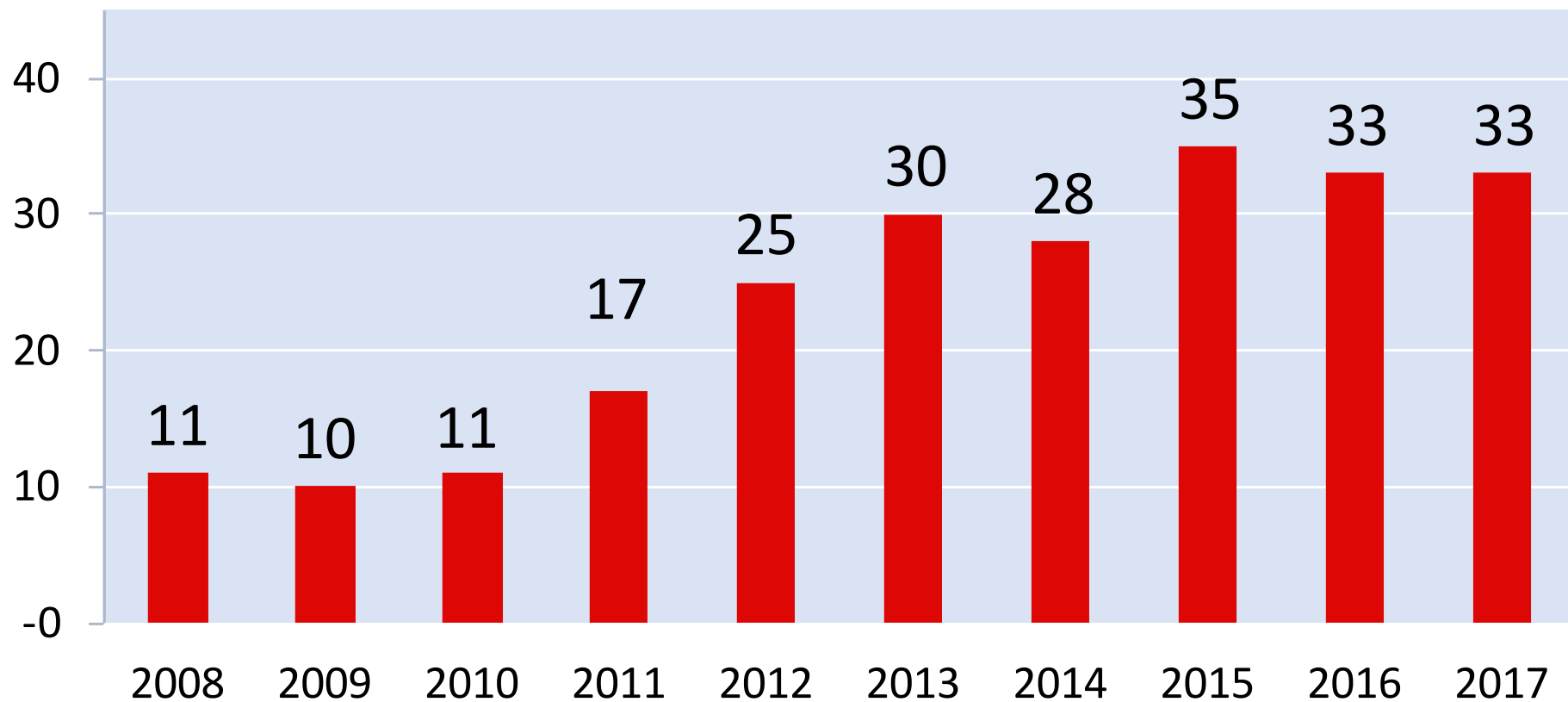




Retrograde Approach/all CTO



of all CTO %



ERCTO registry interim analysis: range between 0 and 56%



The collateral channel crossing remains a challenge, but we shall push the boundaries



ASAHI SUOH 03



- Tip load 0.3 gf
- Tip radiopacity 3 cm
- SLIP-COAT® coating 52 cm

Flexible shaft provides superb trackability and crossability in severe tortuosity. The long radiopaque segment provides good visualization.

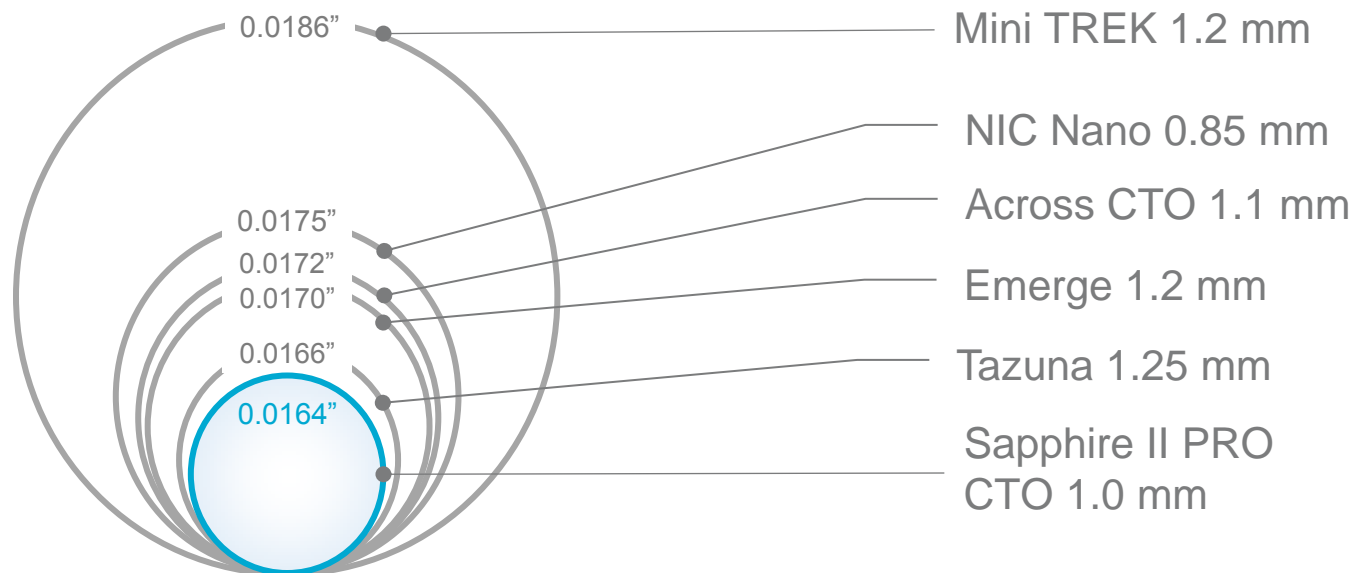


What you need to treat a CTO (complex lesion)



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Speciality balloons

Abbott VascularSIS MEDICAL
Dive in Interventional SystemsAcrostak
Envision the Interventional SystemBoston ScientificTERUMOOrbusNeich[™]
Dedicated to Percutaneous Coronary Intervention

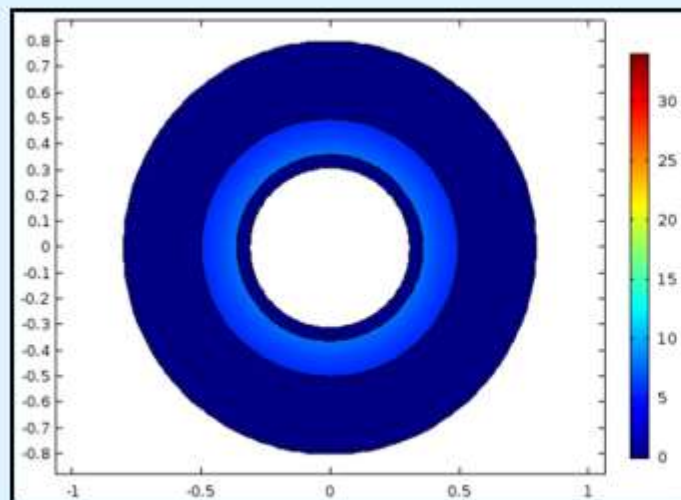
Getting even smaller...

BLIMP

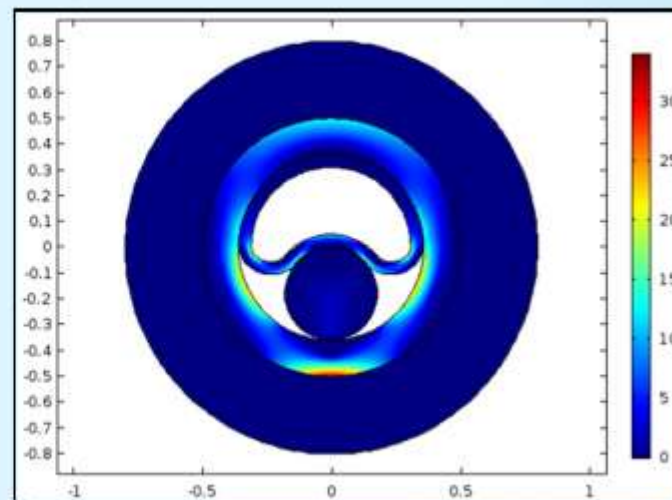
0.6mm



Surface: Principal stress (atm) to Vessel Wall

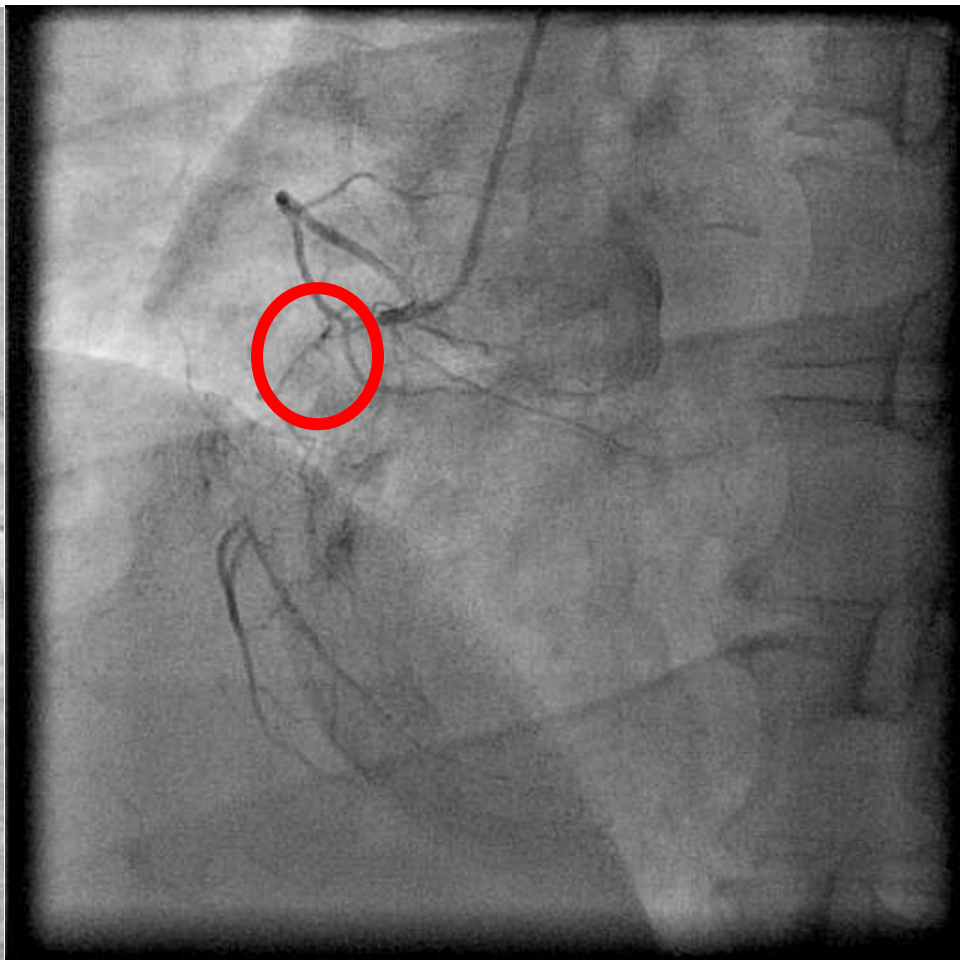
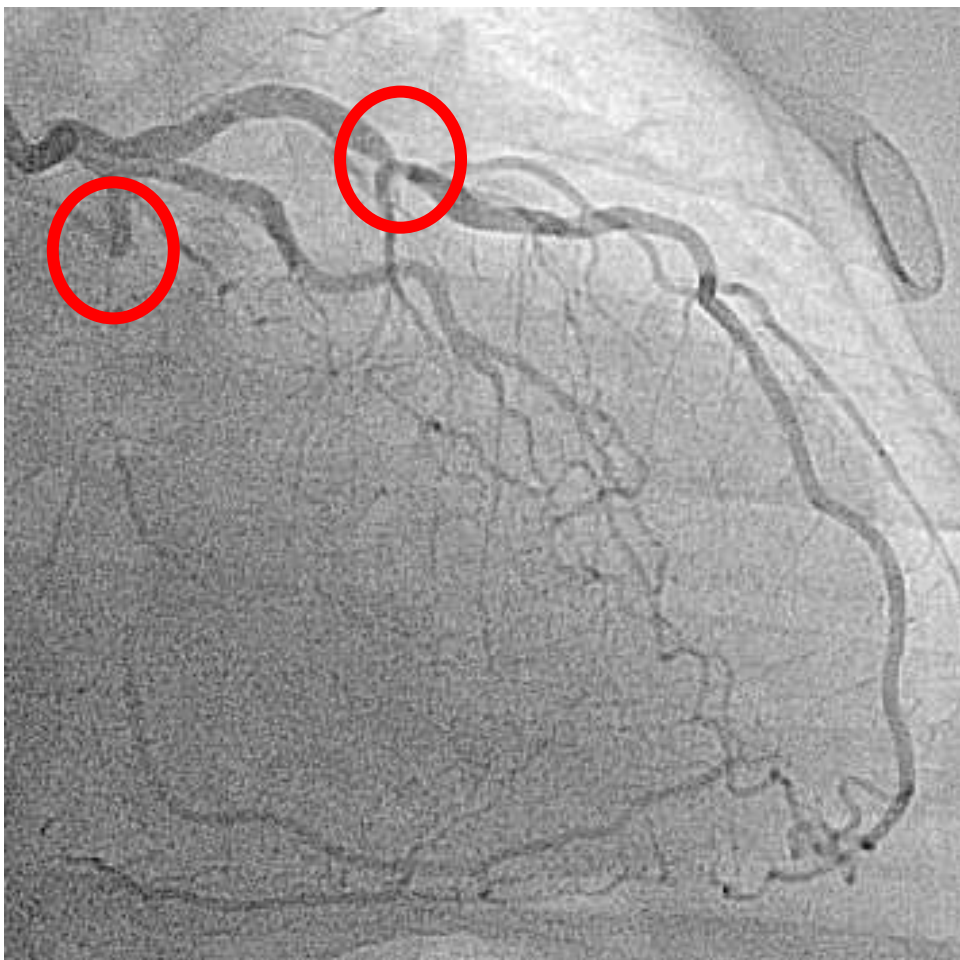


Conventional Balloon at 30 atm



Blimp CTO Scoring Balloon at 30 atm

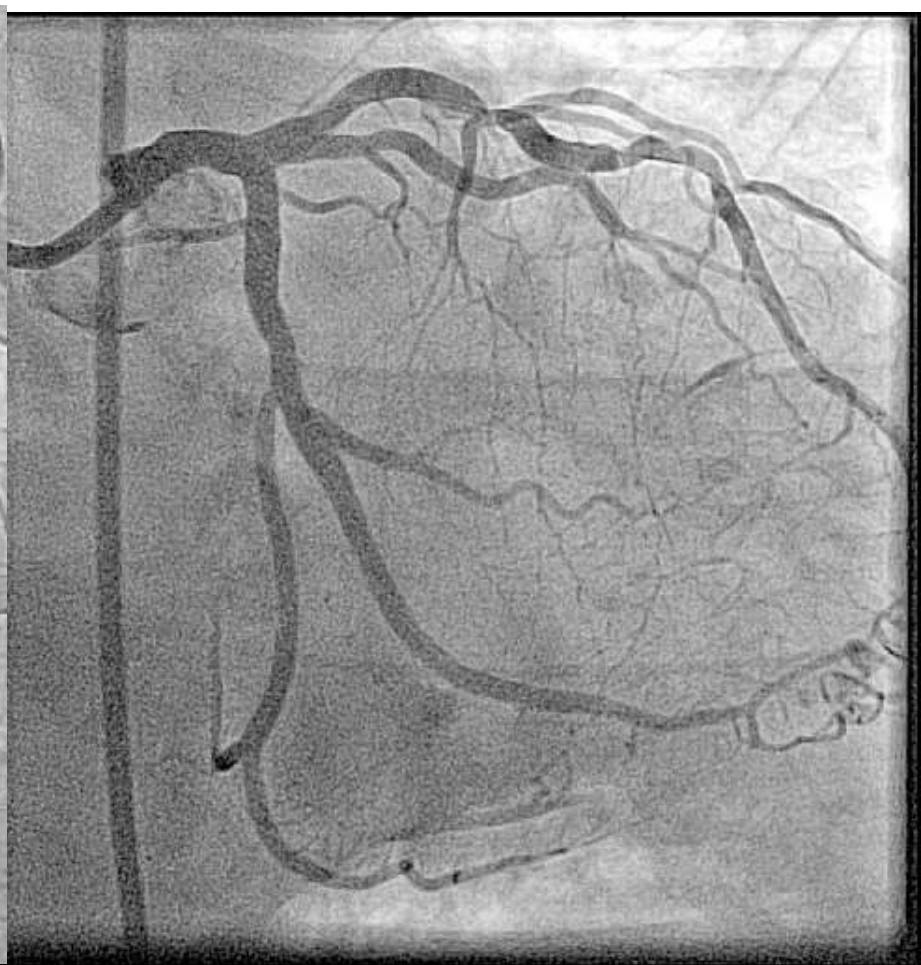
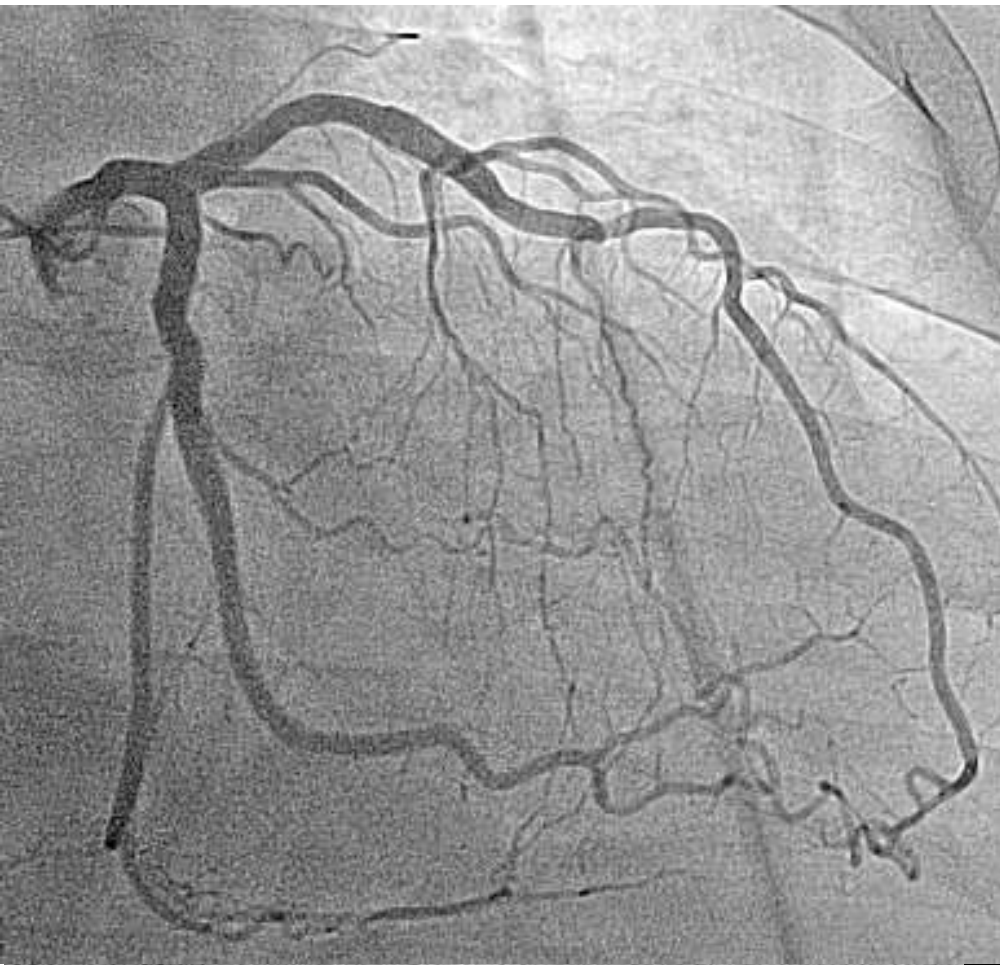
47 years, male: PCI or CABG ?



Complex antegrade and retrograde



Anatomic Reconstruction as goal



RCA often underestimated by the surgeon

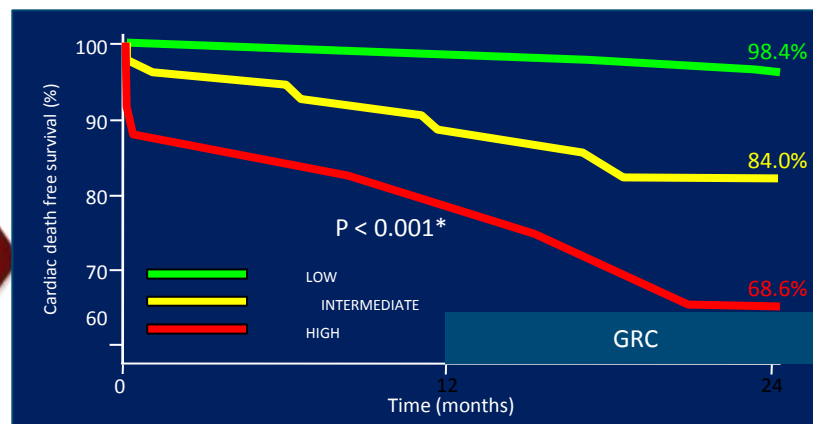
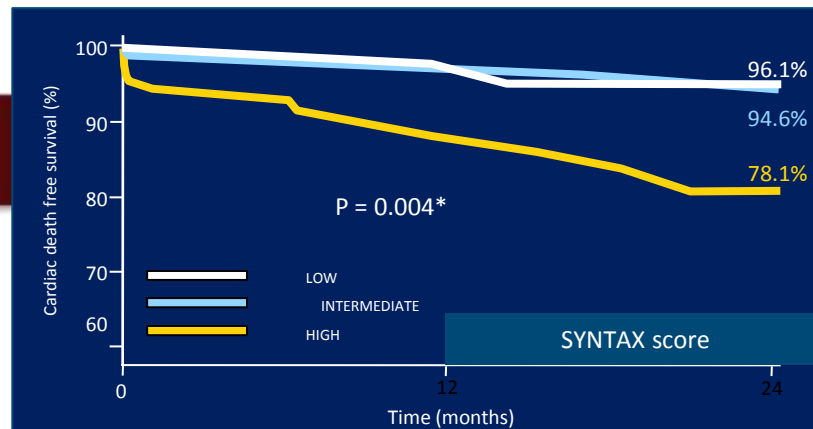




Clinical Morbidity Discriminates the Risk of PCI -> Complex & High Risk Interventional Procedure (CHIP)

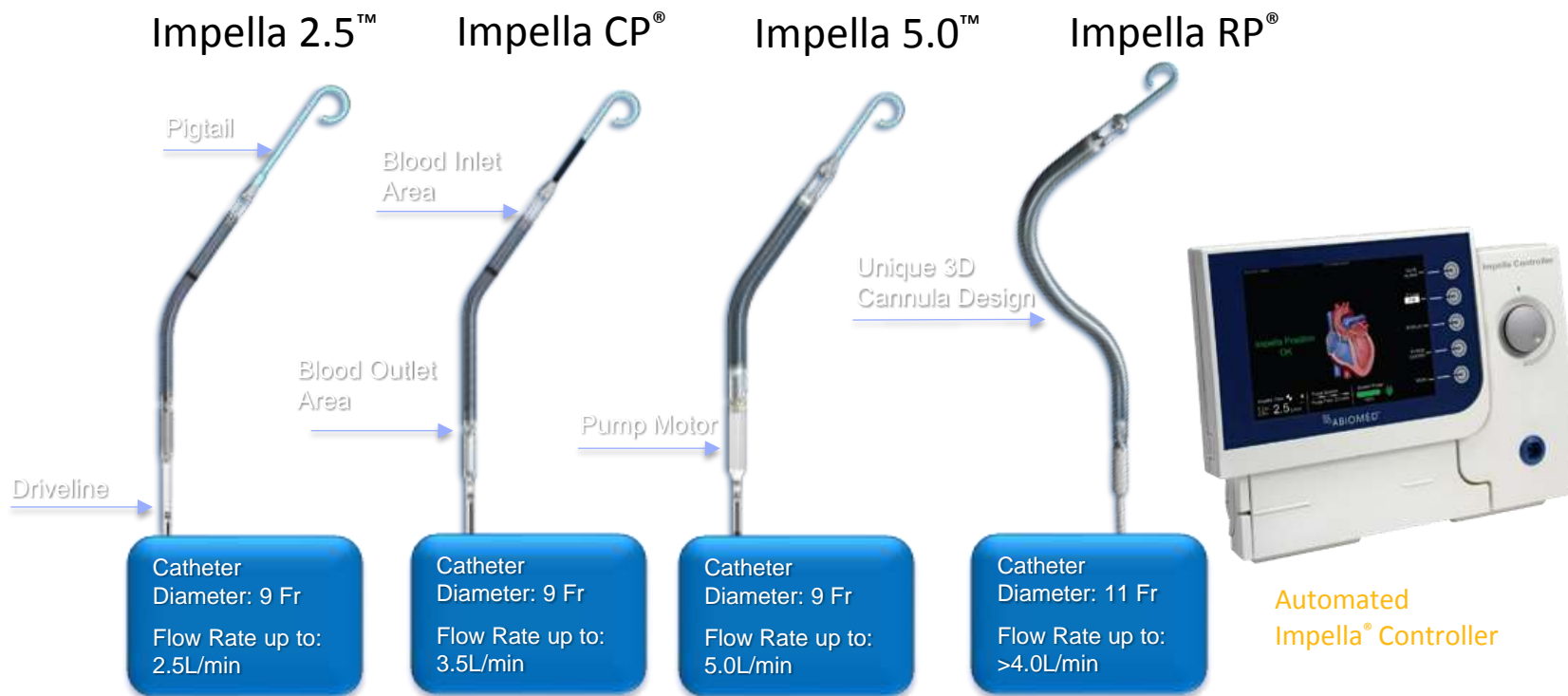


		SYNTAX score		
		< 19	19-27	> 27
EuroSCORE	0-2	L	L	I
	3-6	L	L	I
	> 6	I	I	H





Doing complex interventions in stable conditions





PCI in 2018 is not likely to get boring



- We are able to tackle even more complex situations not only regarding lesion anatomy but also hemodynamically compromised patients
- We need to keep an open mind to new devices, but also preserve what has worked in the past