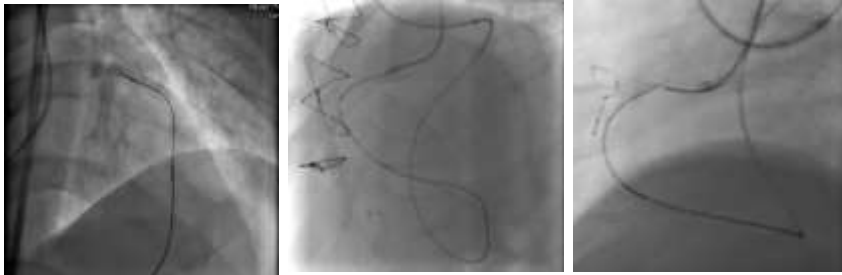


Alhyatt LIVE 2019

Aswan Heart Centre CTO Program

Ahmed M. ElGuindy, MD, FRCP, FACC, FSCAI



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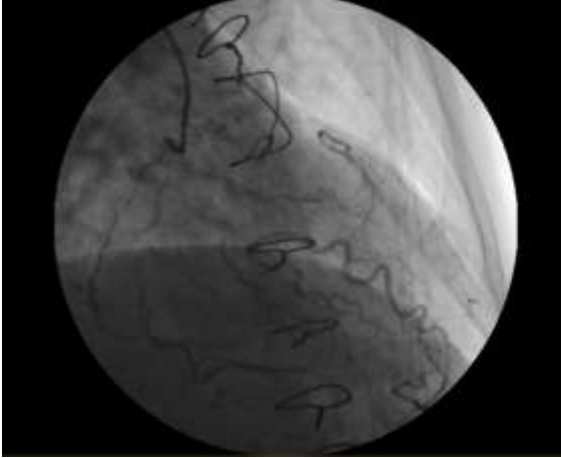


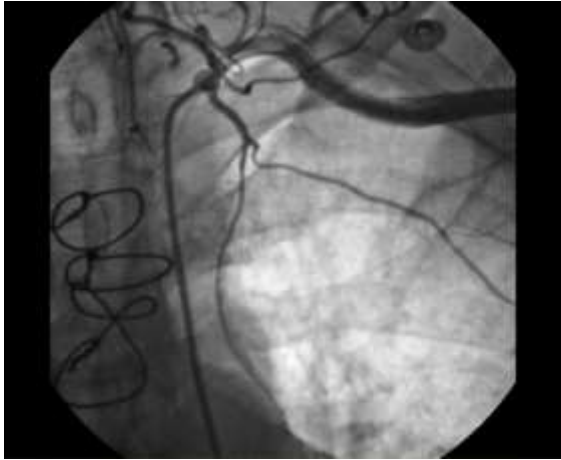
- 55 year-old gentleman
- Smoker, hypertensive, DM, CKD (eGFR: 43 ml/min/1.73m²)
- S/P CABG X3 6 years earlier
- Angina CCS III
- EF = 40% Not in CHF
- MSCT: occluded LIMA-to-LAD, occluded SVG to RCA, occluded SVG to OM
- CMR: viable myocardium – all territories

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Diagnostic angio (15 months earlier)



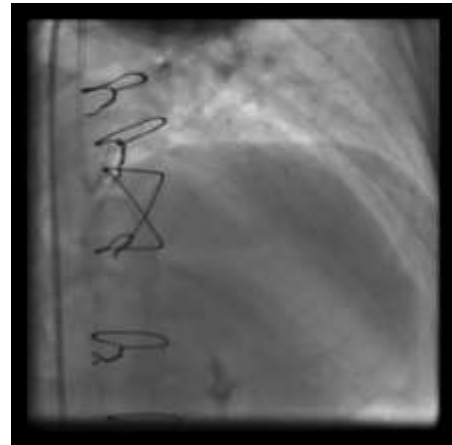
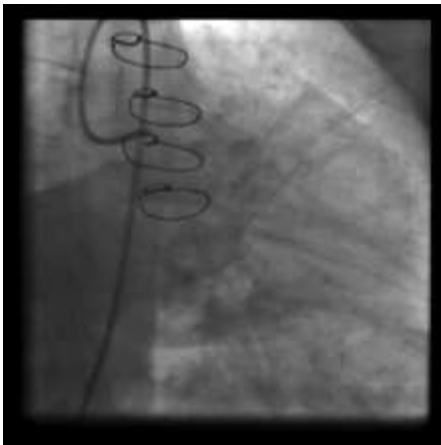


- Continued to suffer from chest pain on minimal effort
- On sick leave
- Under the impression that the only solution is high-risk redo surgery .

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15 months later



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LAD lesion

- Ambiguous proximal cap
- Mildly diseased distal vessel
- Tortuous epicardial ipsilateral collaterals (focal lesion in donor vessel)
- Lesion length \approx 60mm

RCA lesion

- Proximal cap: +/-
- Distal cap at a bifurcation
- Tortuous epicardial collateral from LCx
- Lesion length \approx 60mm

**Plan**

- Staged procedure: LCx and LAD first followed by RCA after 6-8 weeks
- LAD: primary retrograde (r-CART) via epicardial collateral
- RCA: primary retrograde (distal bifurcation)
 - Evaluate collateral circulation after LAD recanalization



Procedure #1

LCx direct stenting (3.5 X 18mm) and retrograde access



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SAWAN REHABI CENTRE
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ROBIN HARRIS CENTER
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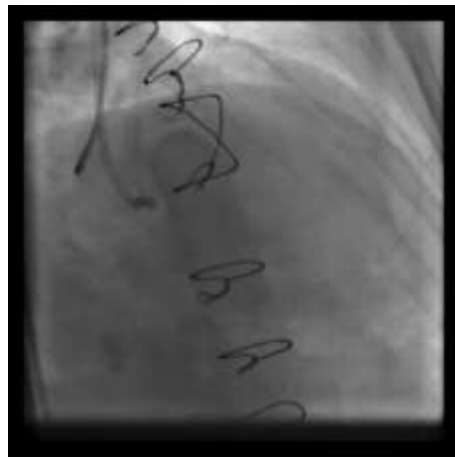
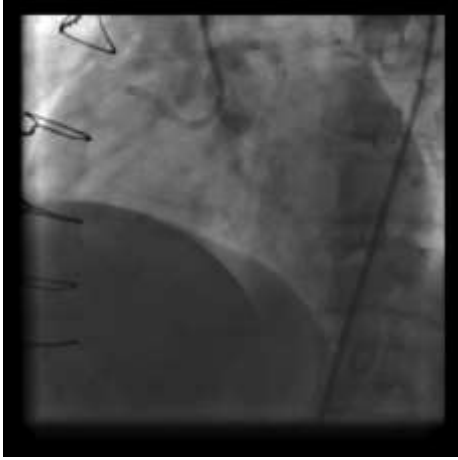
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- Procedure time: 90 minutes
- Radiation: 3.2 Gy
- Contrast volume: 220 cc

Two months later

Procedure #2



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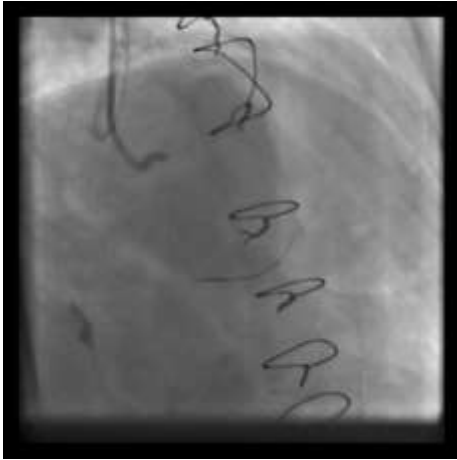


Good septal collateral now available
Distal LAD ISR

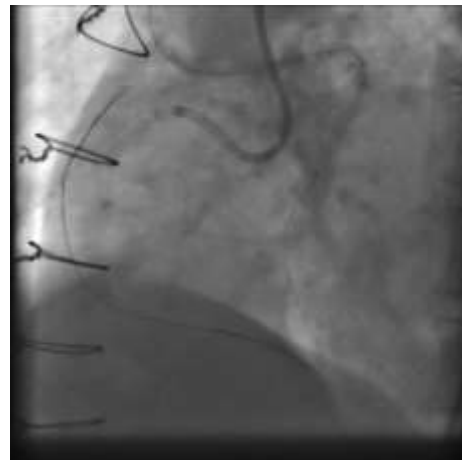
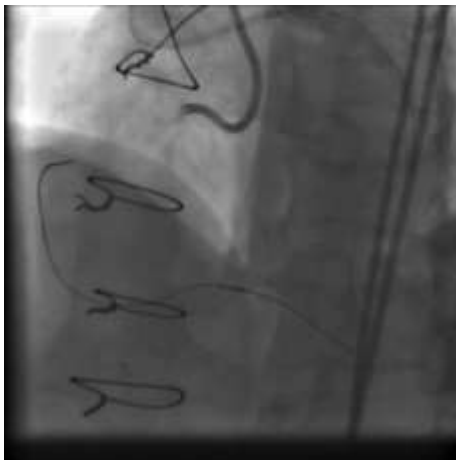


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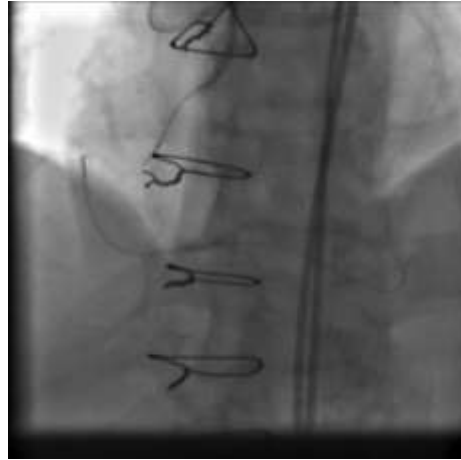




Funny course?



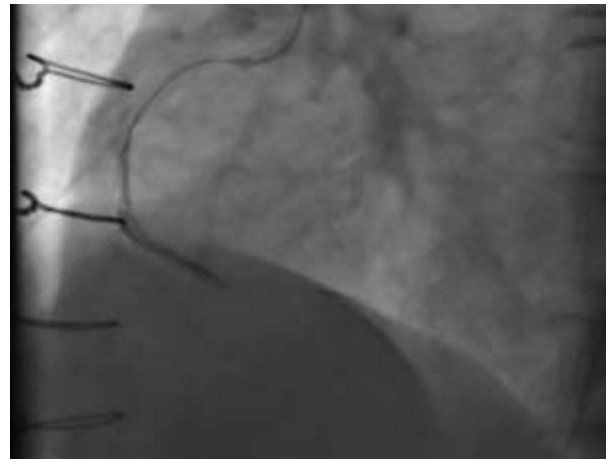
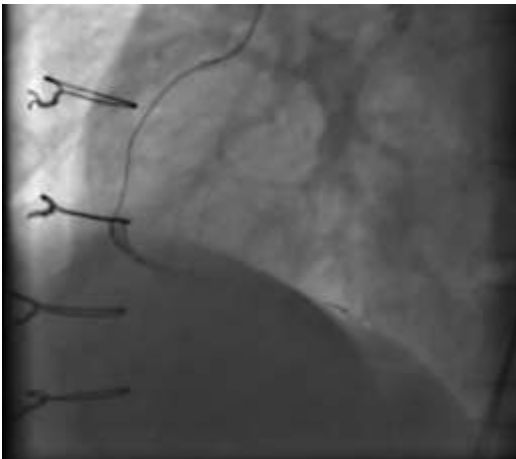
Knuckle repeatedly advances into SVG
Shifted to antegrade (AL1 changed to JR)



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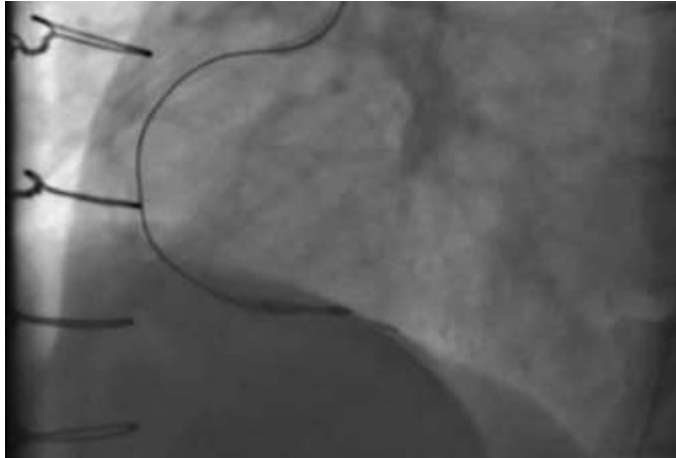


Antegrade knuckle: unable to advance → Carlino



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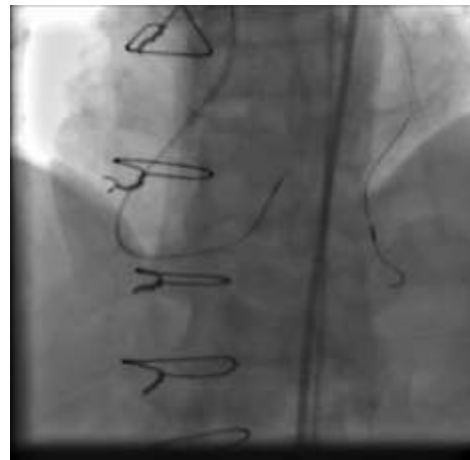
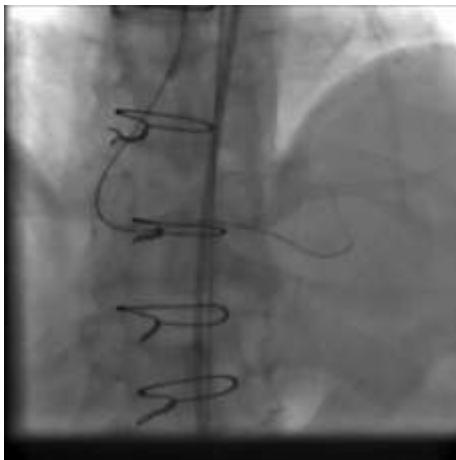




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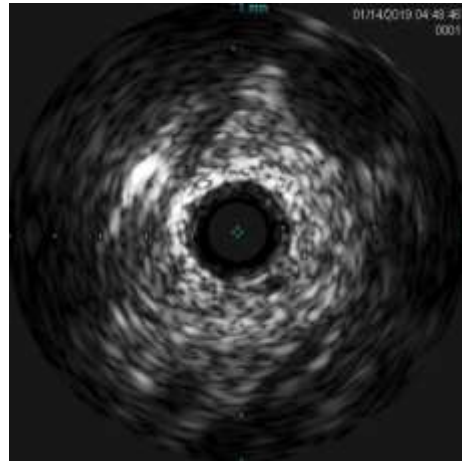


Re-entry (wire-based into PDA and STAR into PLA)
PLA POBA



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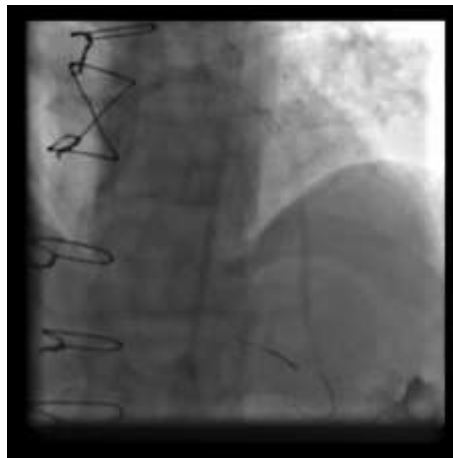




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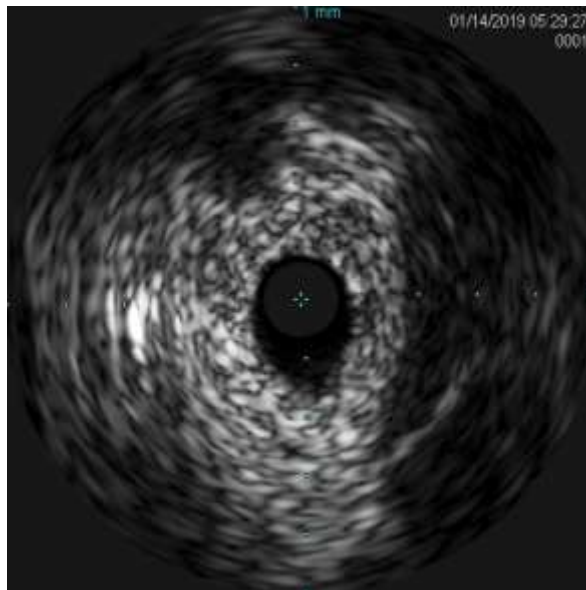
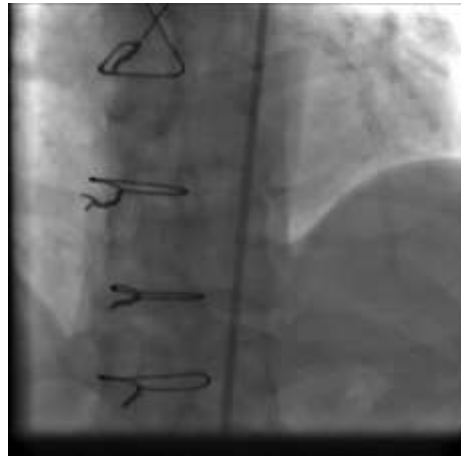
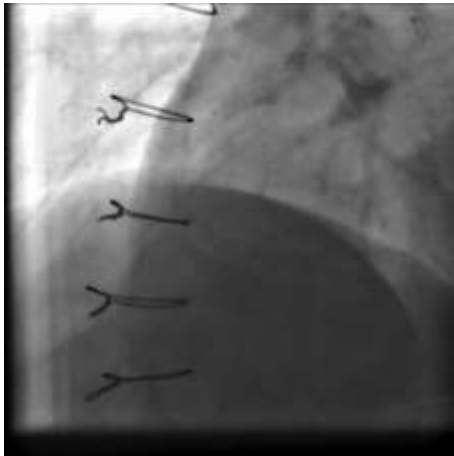
LAD fixed with a DCB



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Final result



Doing CHIP cases \neq having a CHIP PROGRAM

Why is CHIP here to stay?

DEMAND



Older, sicker patients

SUPPLY



Skilled interventional cardiologists willing to tackle previously untreatable lesions

Components of a CTO Program

- **Infrastructure**
 - Cath-lab(s)
 - Volume
 - Equipment
 - Bailout equipment
 - Cardiac surgery
- **Human Resources**
 - Operator
 - Team
- **Training and CME**
 - Proctorship
 - Self-teaching
 - Exchange experience (meetings and workshops, online communities)
 - Structured fellowship programs
- **Reporting outcomes and Audit**
- **Administration**



Components of a CHIP Program

- Patient screening and selection
- Standardized diagnostic/evaluation pathways
- Communication with patients and between team members (protected time)
- Coordination between different teams (coronary, structural, EP, HF, ICU)
- Patient education and counseling
- Periprocedural planning – including discharge
- Allocation of adequate resources (infrastructure, resources, time)
- Funding and administrative support
- Training and continuous education, structured CHIP fellowships
- Program evaluation for quality and outcomes
- Data entry and management
- Publication



CHIP operator skillset

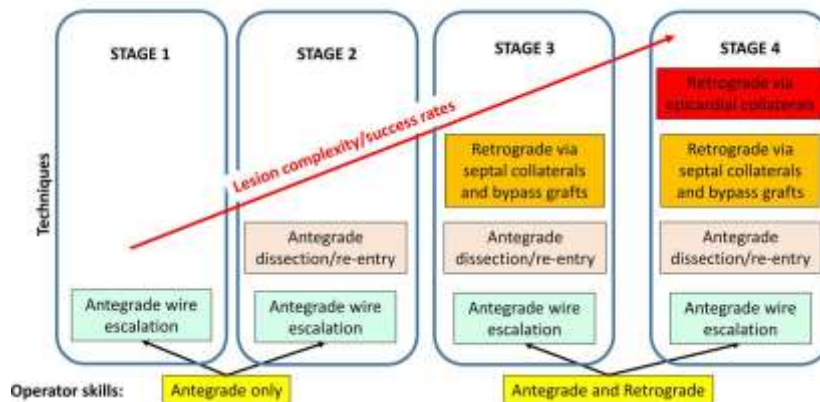
Arterial access	<ul style="list-style-type: none"> Large-bore sheaths Radial access Bilateral femoral access Advanced techniques (percutaneous aortic/bi-axial)
CTO	<ul style="list-style-type: none"> Antegrade wire escalation Antegrade dissection re-entry Retrograde
Left main	<ul style="list-style-type: none"> Distal-proximal strategies Two-stent techniques (double-kissing, crush, culotte)
Advanced imaging	<ul style="list-style-type: none"> Proficiency with IVUS/OCT
Calcific disease	<ul style="list-style-type: none"> Rotational atherectomy/orbital atherectomy
Renal/vascular support	<ul style="list-style-type: none"> Inpella 25/30 for protected PCI treatment of calcific stenosis Vita-arterial balloon counterpulsation Endovascular medicine augmentation
Complication management	<ul style="list-style-type: none"> Coronary perforation management techniques (covered stents, coils, embolization) Access site complications (peripheral stents/covered stent deployment) Repair of coronary dissection Emergency pericardiocentesis

- Commitment and passion
- Procedural volume
- Continuous development
- Communication
- Sharing experience

- *Failure*
- *Futility*

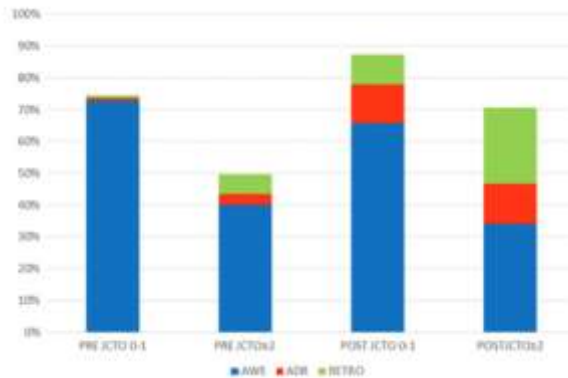


Evolution of a CTO operator



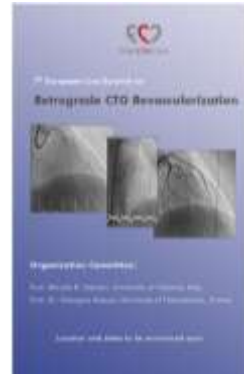
Training and continuous education

- Willing to go through a training/proctorship phase

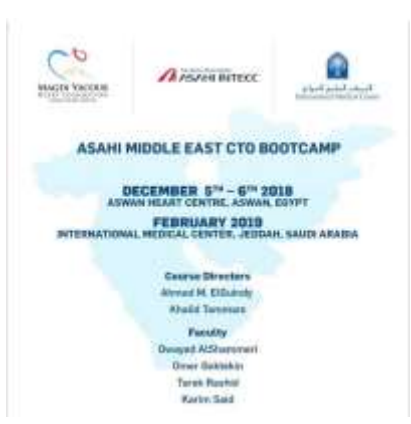


Self-learning and online education





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Career stage

- Mid-career seems to be optimal.
- Solid experience in complex PCI
- More likely to be able to learn new skills and “unlearn” older habits.
Can be lengthy and physically-demanding procedures
- Partnership with a colleague
- Passion and commitment

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Leadership

- Team-building: Able to build a team, motivate members and improve their skills
- Build the necessary infrastructure
- Communicate effectively with management
- Audit



Procedural volume

- Operator volume correlates with outcomes
- >50 CTO PCI procedures/year required

Dunning-Kruger Effect

Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments
Kruger, J., & Dunning, D. (1999)



Audit and improving outcomes

- Fundamental component of any program
- Only method to identify weaknesses and improve outcomes
- Failures and complications will happen! Learn from them and move forward
- Regional/international registries: benchmarking and exchange of expertise

Audit and improving outcomes

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- Regional/international registries: benchmarking and exchange of expertise

06/22/2017

06/22/2017

Patient Information (do not complete if 2nd CTO) - rez

06/22/2017

Procedure ID: _____

Procedure Information:

Procedure Name: _____

Procedure Date: _____

Procedure Location: _____

Procedure Type: _____

Procedure Status: _____

Procedure Category: _____

Procedure Subcategory: _____

Procedure Code: _____

Procedure Description: _____

Procedure Notes: _____

Procedure Results: _____

Procedure Complications: _____

Procedure Outcomes: _____

Procedure Follow-up: _____

Procedure Review: _____

Procedure Approval: _____

Procedure Rejection: _____

Procedure Cancellation: _____

Procedure Rescheduling: _____

Procedure Extension: _____

Procedure Termination: _____

Procedure Suspension: _____

Procedure Revocation: _____

Procedure Withdrawal: _____

Procedure Withdrawal Reason: _____

Procedure Withdrawal Date: _____

Procedure Withdrawal Status: _____

Procedure Withdrawal Code: _____

Procedure Withdrawal Description: _____

Procedure Withdrawal Notes: _____

Procedure Withdrawal Results: _____

Procedure Withdrawal Outcomes: _____

Procedure Withdrawal Follow-up: _____

Procedure Withdrawal Review: _____

Procedure Withdrawal Approval: _____

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Procedure Withdrawal Withdrawal Notes: _____

Procedure Withdrawal Withdrawal Results: _____

Procedure Withdrawal Withdrawal Outcomes: _____

Procedure Withdrawal Withdrawal Follow-up: _____

Procedure Withdrawal Withdrawal Review: _____

Procedure Withdrawal Withdrawal Approval: _____

Procedure Withdrawal Withdrawal Rejection: _____

Procedure Withdrawal Withdrawal Cancellation: _____

Procedure Withdrawal Withdrawal Rescheduling: _____

Procedure Withdrawal Withdrawal Extension: _____

Procedure Withdrawal Withdrawal Termination: _____

Procedure Withdrawal Withdrawal Suspension: _____

Procedure Withdrawal Withdrawal Revocation: _____

Procedure Withdrawal Withdrawal Withdrawal: _____

Do the right things for patients. There has been too much focus on success and showing off. That era has now ended. With PROGRESS, UK Hybrid, Euro CTO, Japanese Expert Registry, and OPEN CTO all showing success rates between 88% and 92%, it is clear that if you put in the time and effort you can be highly successful at CTO PCI.


I offer you a different thought as you read through the following pages. Think less about success and more about how to improve. A successful procedure is different than a successful therapy. When you have a technical success but it took more than 2 h, reflect on why. When you watch live case demonstrations,

Foreword by William Lombardi
In Manual of CTO Interventions, 2nd ed

Rewards

- Serve more patients safely and efficiently
- Enhance technical skills and overall competence (including non-CTO)
- Team and institutional gains
- ~~Boosting your ego~~
- ~~Generating income~~

Percutaneous Management of a Giant Left Anterior Descending Artery Aneurysm via the Retrograde Approach

Amir Samaan , Alaaeldin Amin, Kerolos Wagdy Shaker, Ahmed Osman, Wesam El Mozy and Ahmed ElGuindy

Originally published 20 Aug 2018 |
 Circulation: Cardiovascular Interventions. 2018;11:e006967

[Circulation: Cardiovascular Interventions](#)

CASE REPORTS IN INTERVENTIONAL CARDIOLOGY

	AHC – Q1/2 2019 N=53	AHC – 2018 n=96	AHC – 2017 n=72	PROGRESS CTO n=2100	NCDR
Procedural success	92%	87%	85%	88%	59%
Mortality	0	1%	0	0.4%	0.4%
Tamponade	0	1%	1.4%	0.7%	0.3%
MI	?	?	?	1%	2.7%
Emergency CABG	0	0	0	0	0.8%
Contrast volume	290	320	300*	260 cc	244 cc
Fluoroscopy time	49	53.8 min	52.8 min*	46 min	30 min
Retrograde	30%	21%	16%	28%	??

**Data available for only half the patients*



PROGRESS-CTO

Prospective Global Registry for the Study of Chronic Total Occlusion Intervention



Conclusion

- Growing need for CHIP programs
- Leadership and collaboration are key to success
- Audit and continuous improvement are mission critical
- Managing expectations (patients and staff)

