

Est-ce que

~~Comment~~ la QFR peut changer la pratique de la physiologie

FFR – QFR: même combat?

Xve CARDIORUN, 28 Septembre 2023

Gilles Rioufol MD, PhD

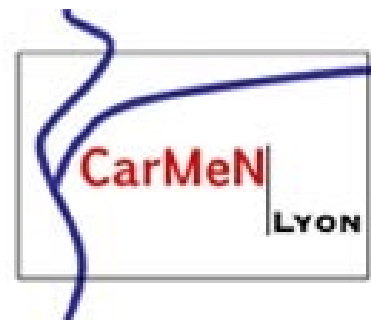
**Interventional cardiology dpt
Cardiovascular Hospital - Lyon - France**



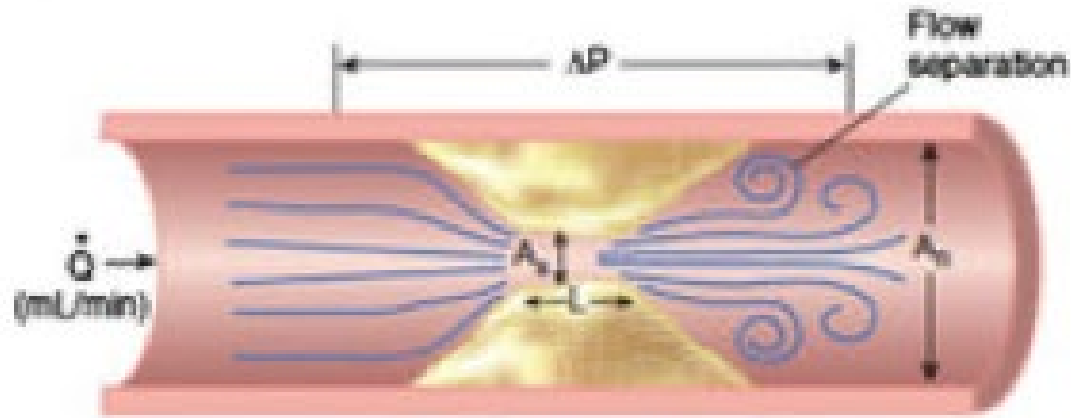
Inserm

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INSERM U1060



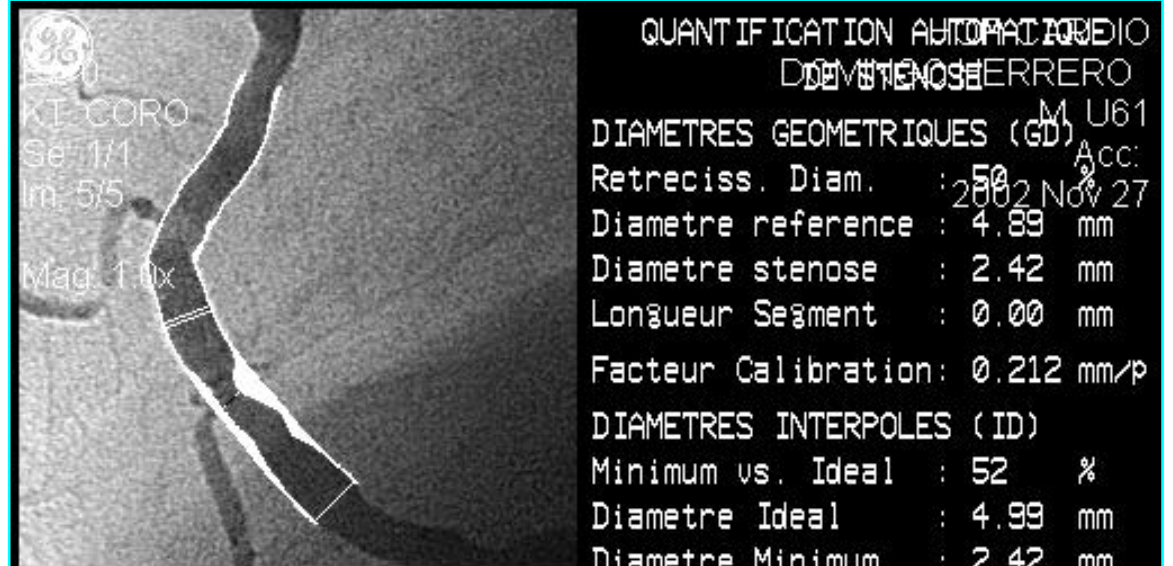
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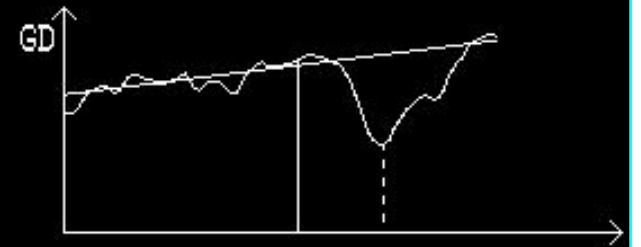
$$\Delta P = \frac{f_1 \dot{Q}}{\text{VISCOUS}} + \frac{f_2 \dot{Q}^2}{\text{SEPARATION}}$$

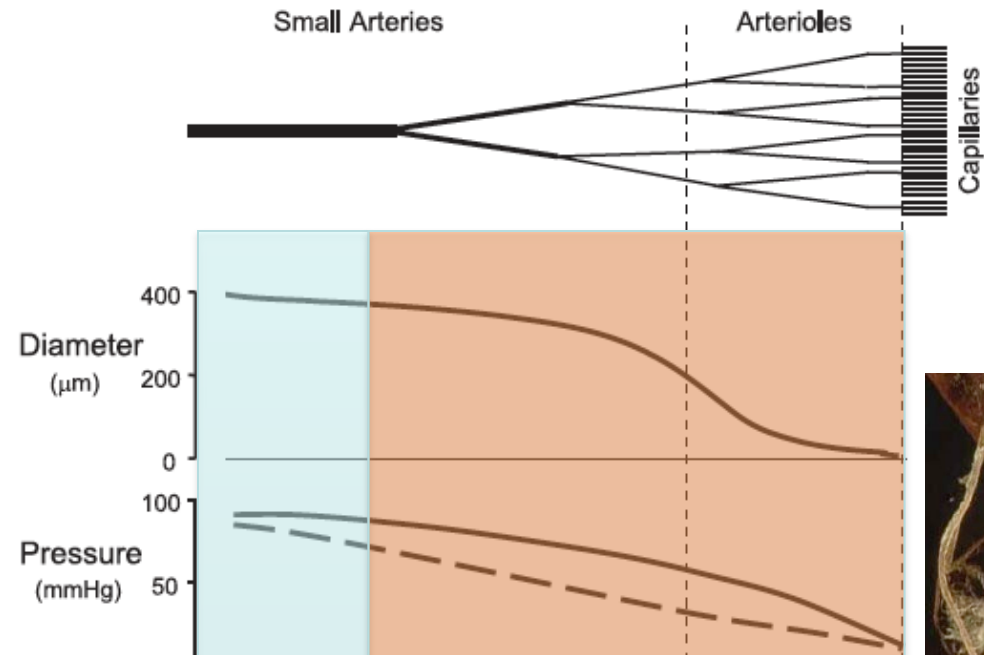
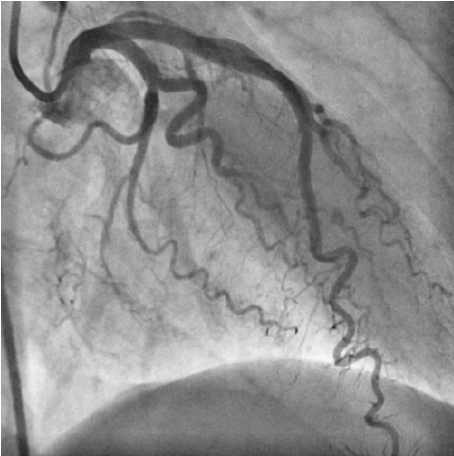
$$f_1 = \frac{8\eta L}{A_1^3}$$

$$f_2 = P/2 [1/A_1 - 1/A_2]^2$$



HOP CARDIO
 HERRERO ,DOMING
 Image 34 de Seq. 6
 Id: U61
 Date naissance: 07-JUL-1930
 Traitement : 27-NOV-2002
 Examen : 27-NOV-2002
 Medecin : PR FINET







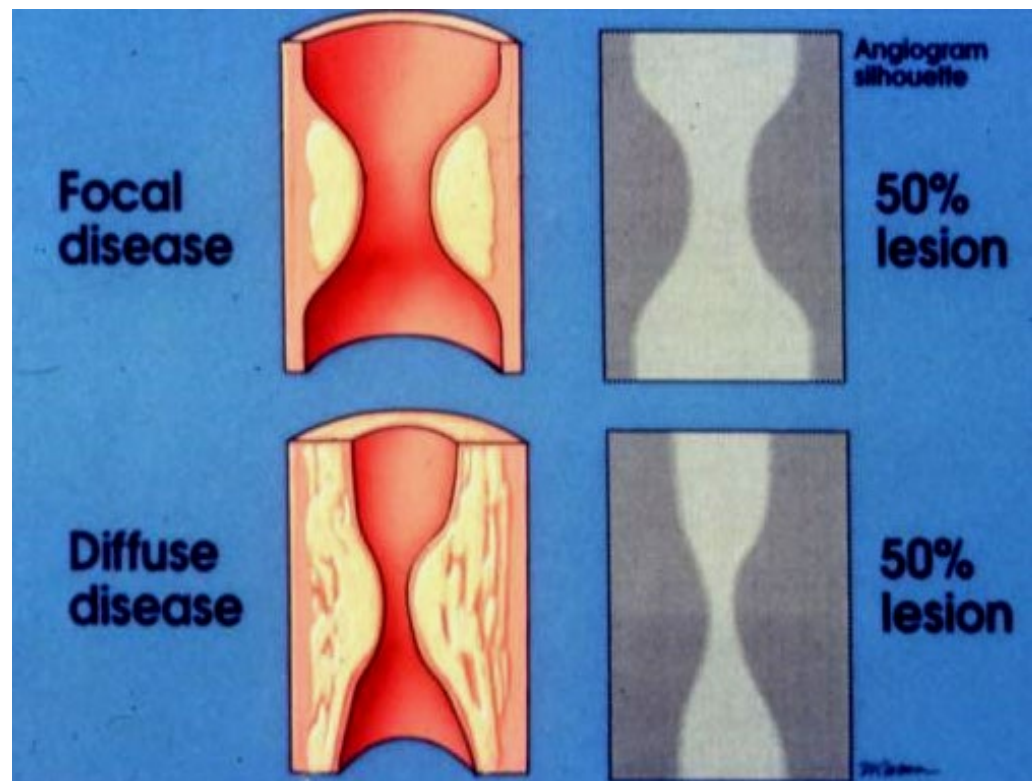
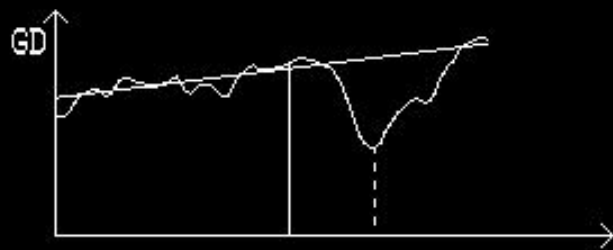
QUANTIFICATION AUTOMATISEE DE LA STENOSE

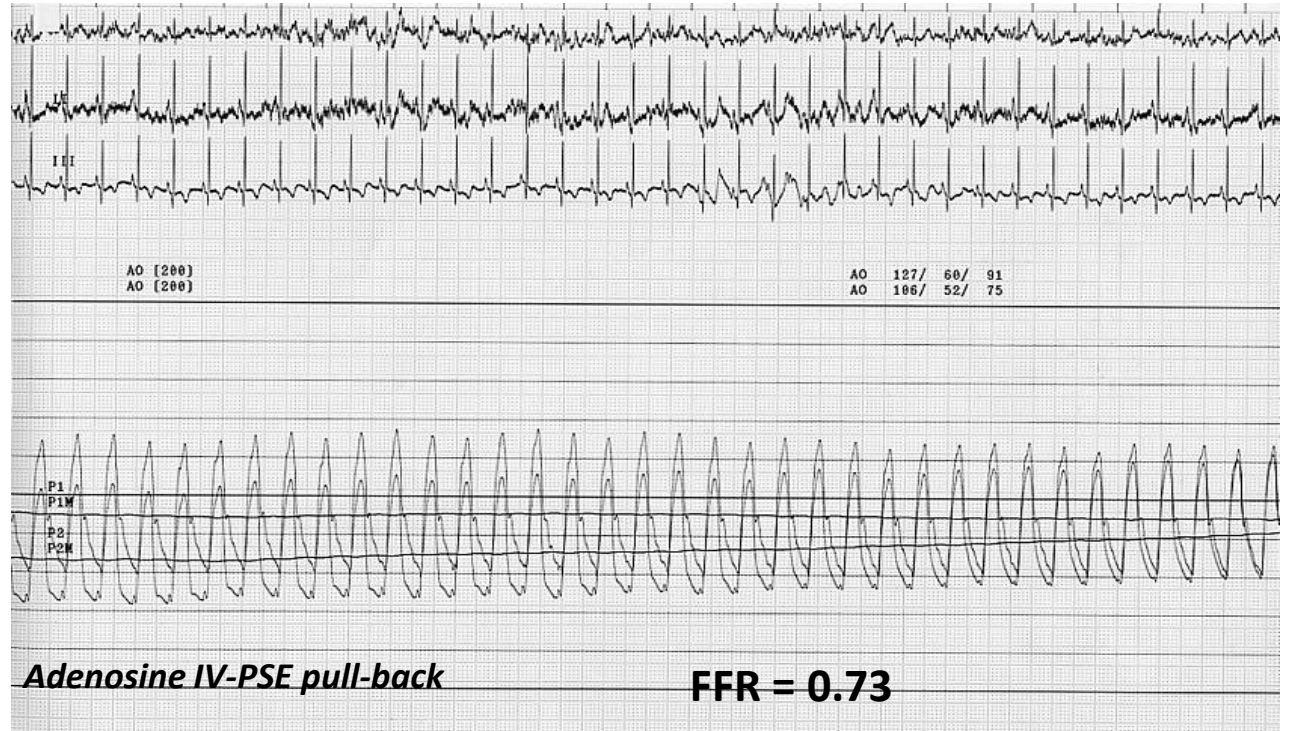
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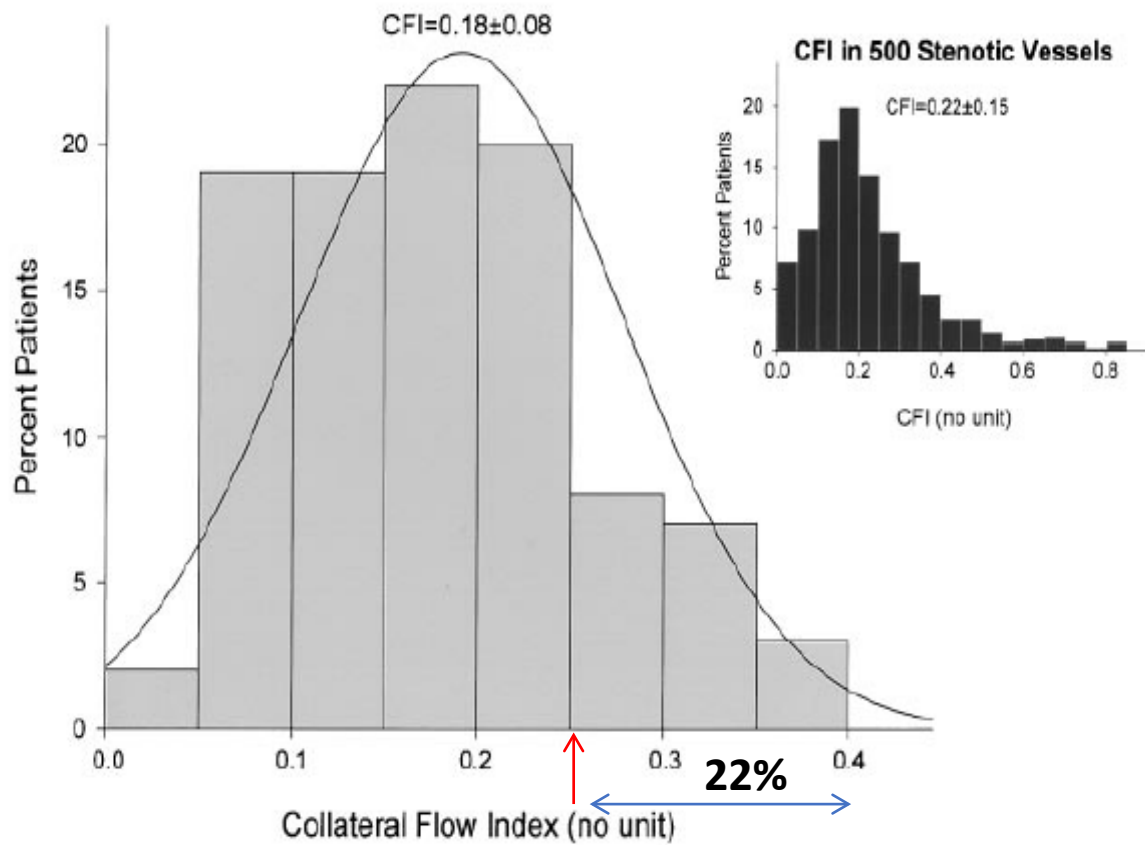
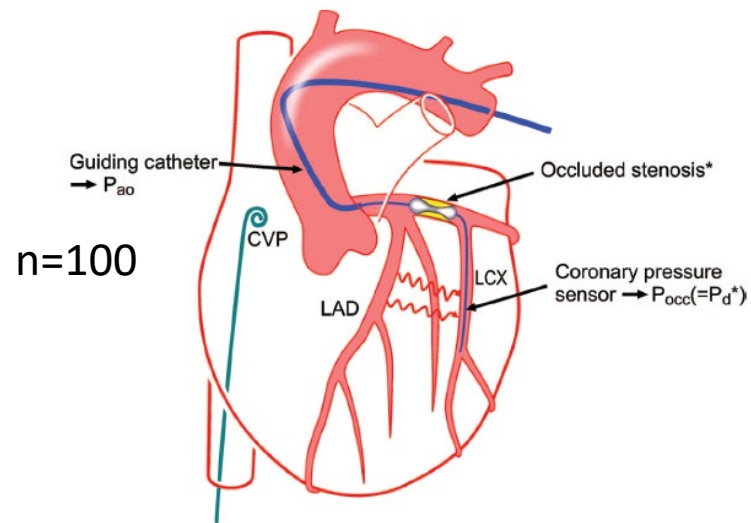
M U61
 Acc: 2002 Nov 27

DIAMETRES GEOMETRIQUES (GD)
 Retreciss. Diam. : 50 %
 Diametre reference : 4.89 mm
 Diametre stenose : 2.42 mm
 Longueur Segment : 0.00 mm
 Facteur Calibration: 0.212 mm/p

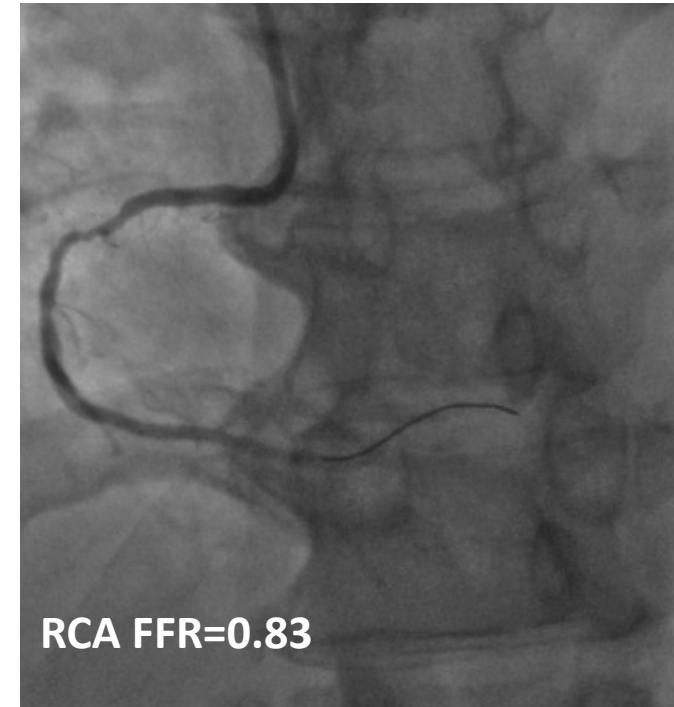
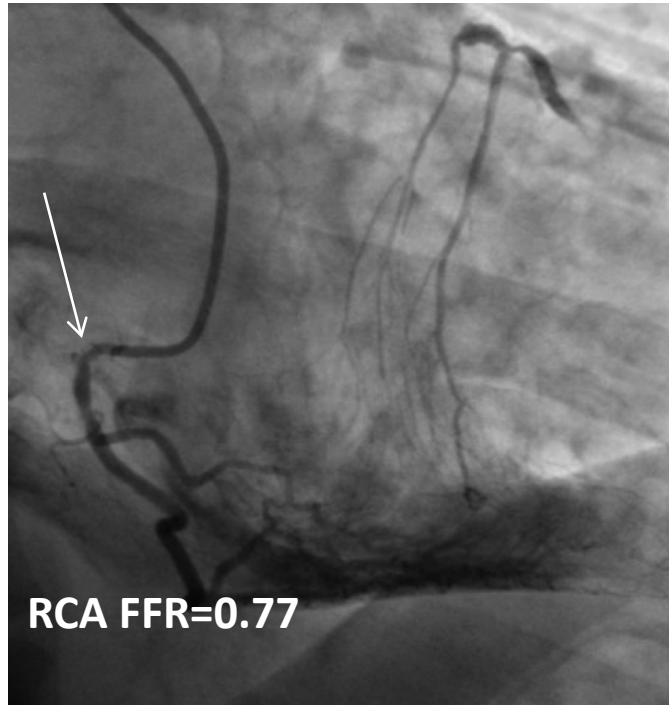
DIAMETRES INTERPOLES (ID)
 Minimum vs. Ideal : 52 %
 Diametre Ideal : 4.99 mm
 Diametre Minimum : 2.42 mm
 Longueur Lesion : 21.92 mm







Myocardial ischaemia assesement : why myocardial mass is the main criteria?



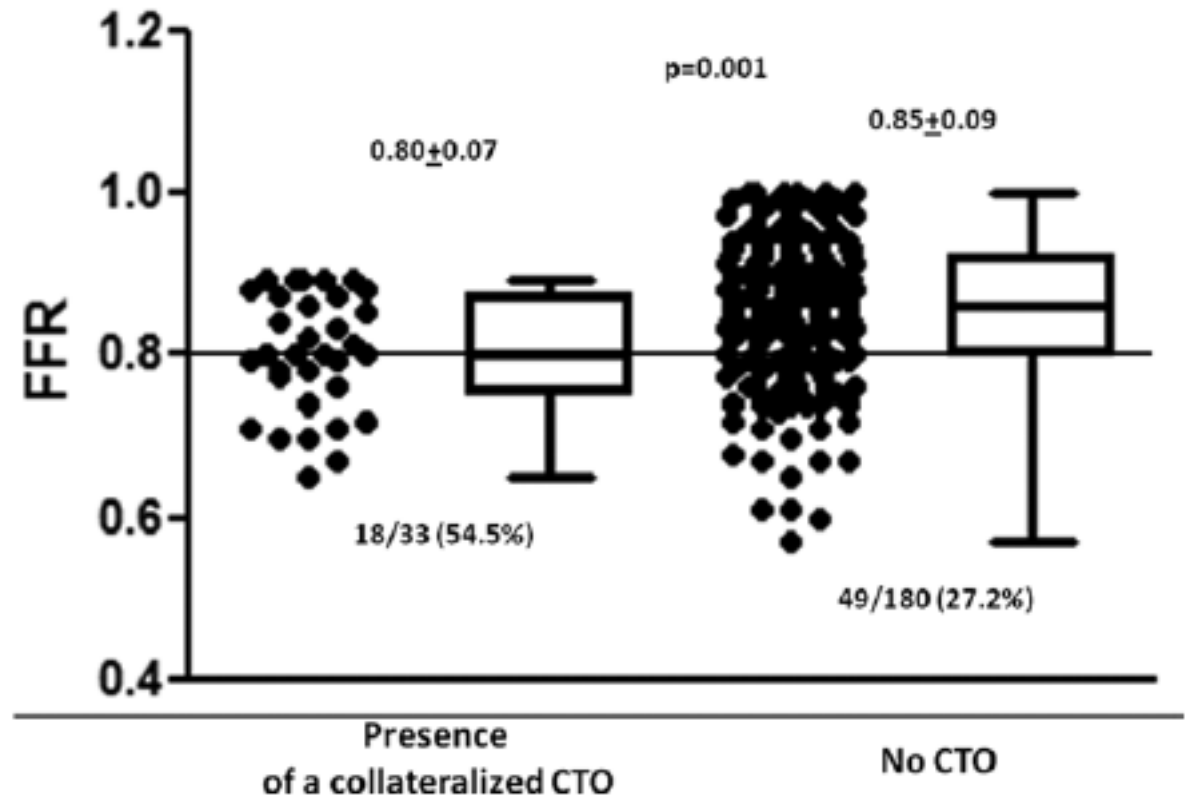
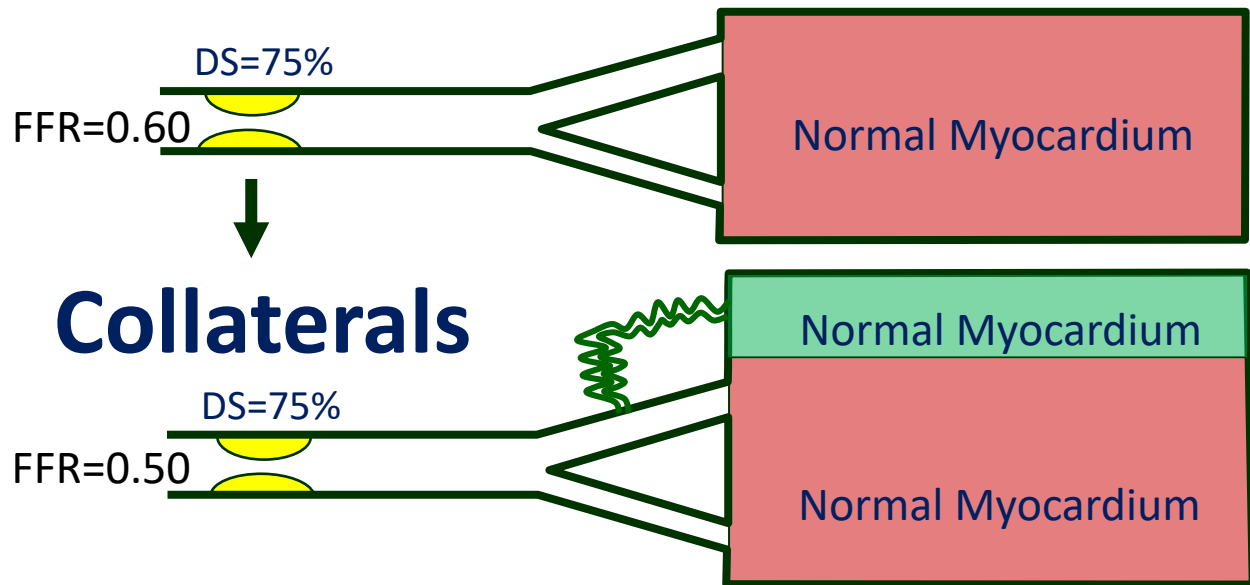
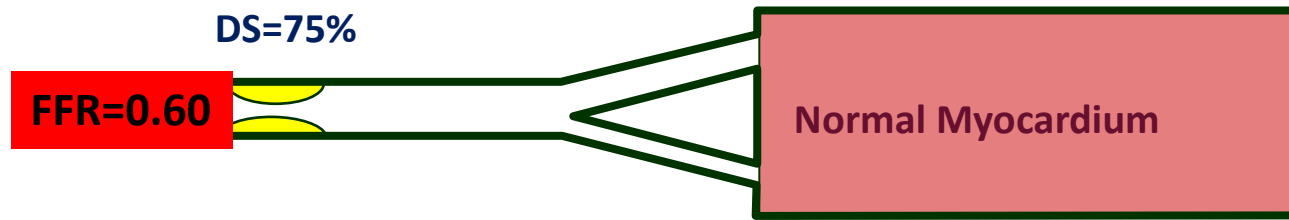


Figure 5. Impact of the presence of a collateralized chronic total occlusion (CTO) on fractional flow reserve (FFR).

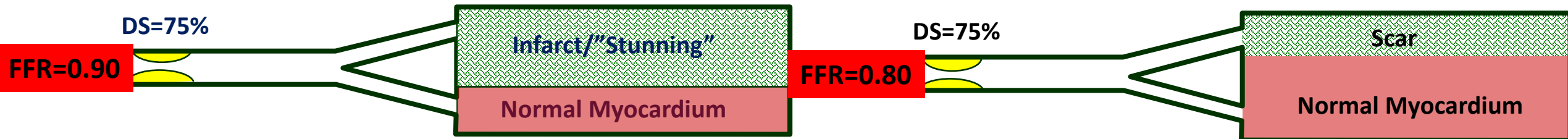
Hyperhemia and what's below the epicardial artery (I)



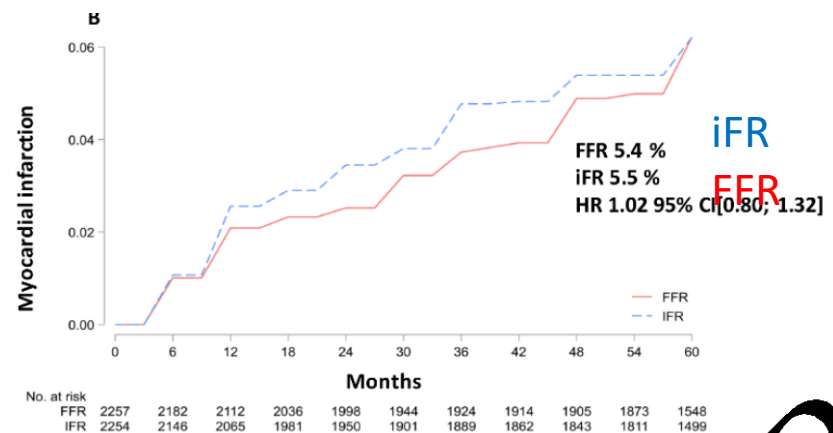
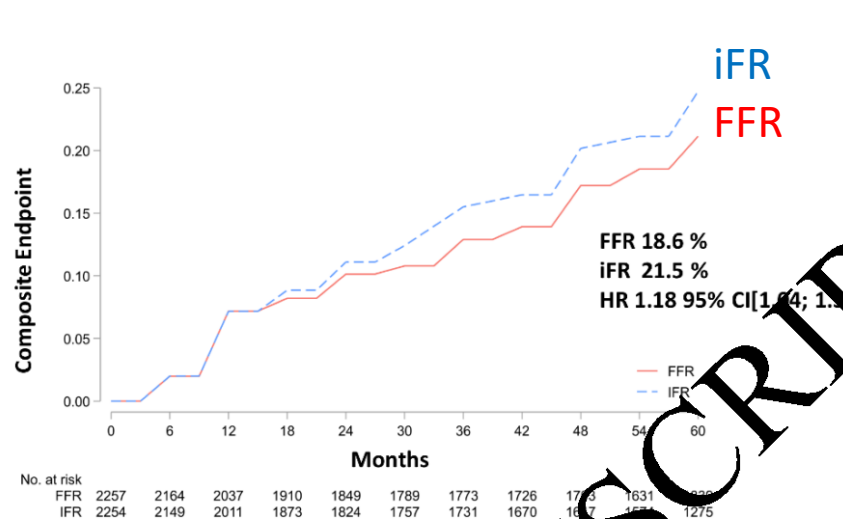
Acute Myocardial Infarction

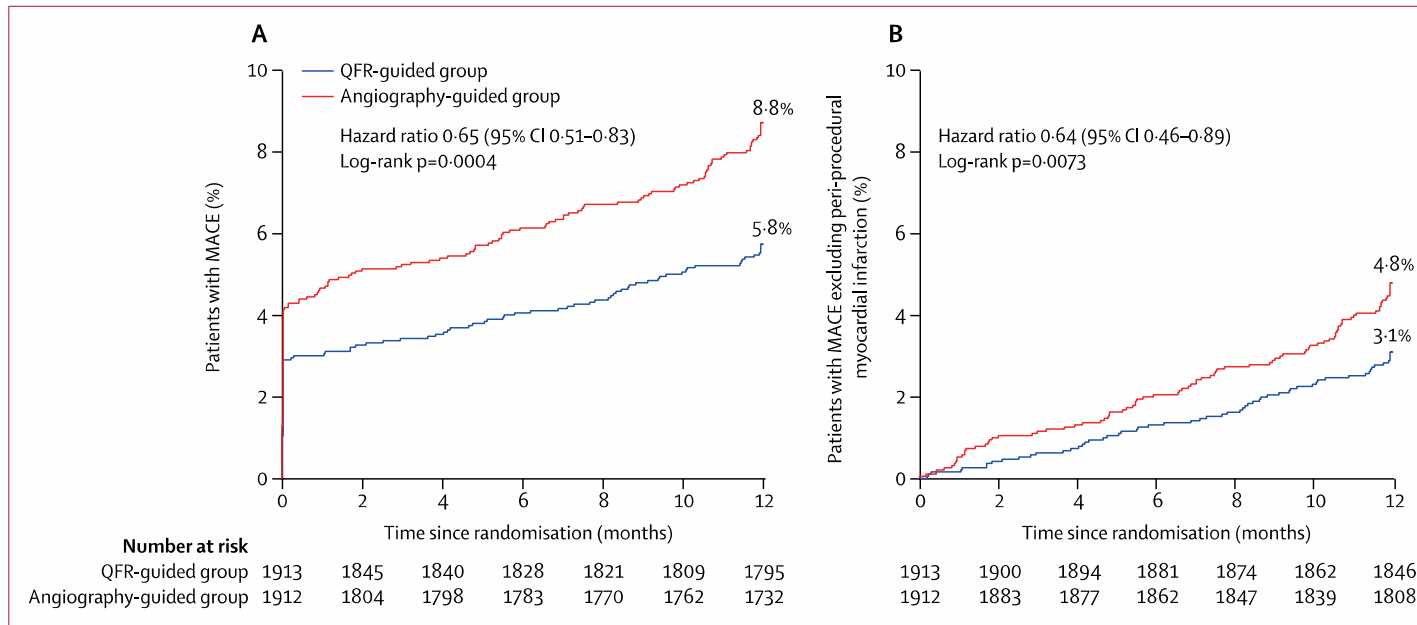


Old Myocardial Infarction



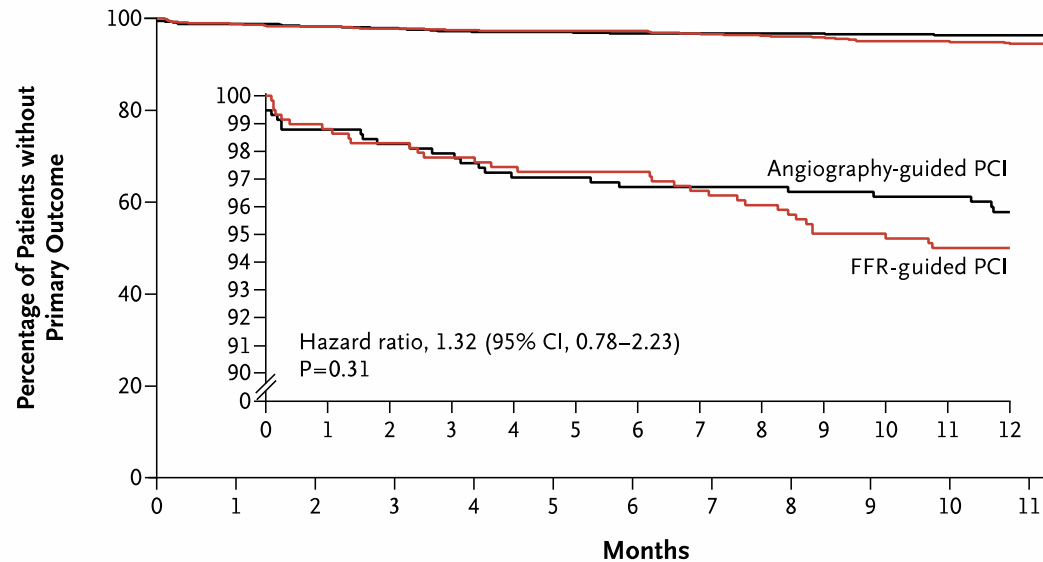
Pooled-analysis of iFR SWEDHEART & DEFINE-FLAIR



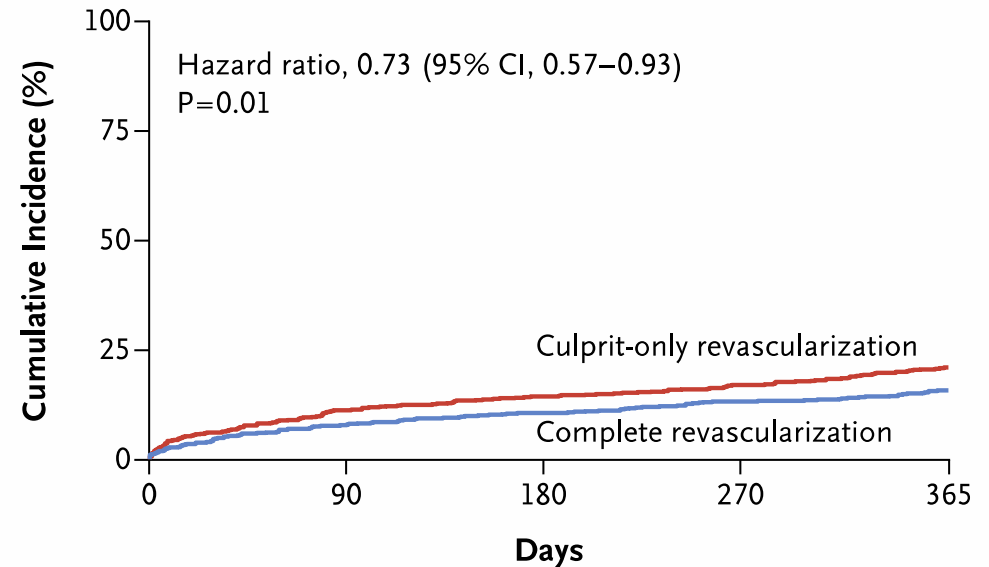


Xu Lancet 2021

A Death, Myocardial Infarction, Stroke, or Coronary Revascularization (Primary Outcome)



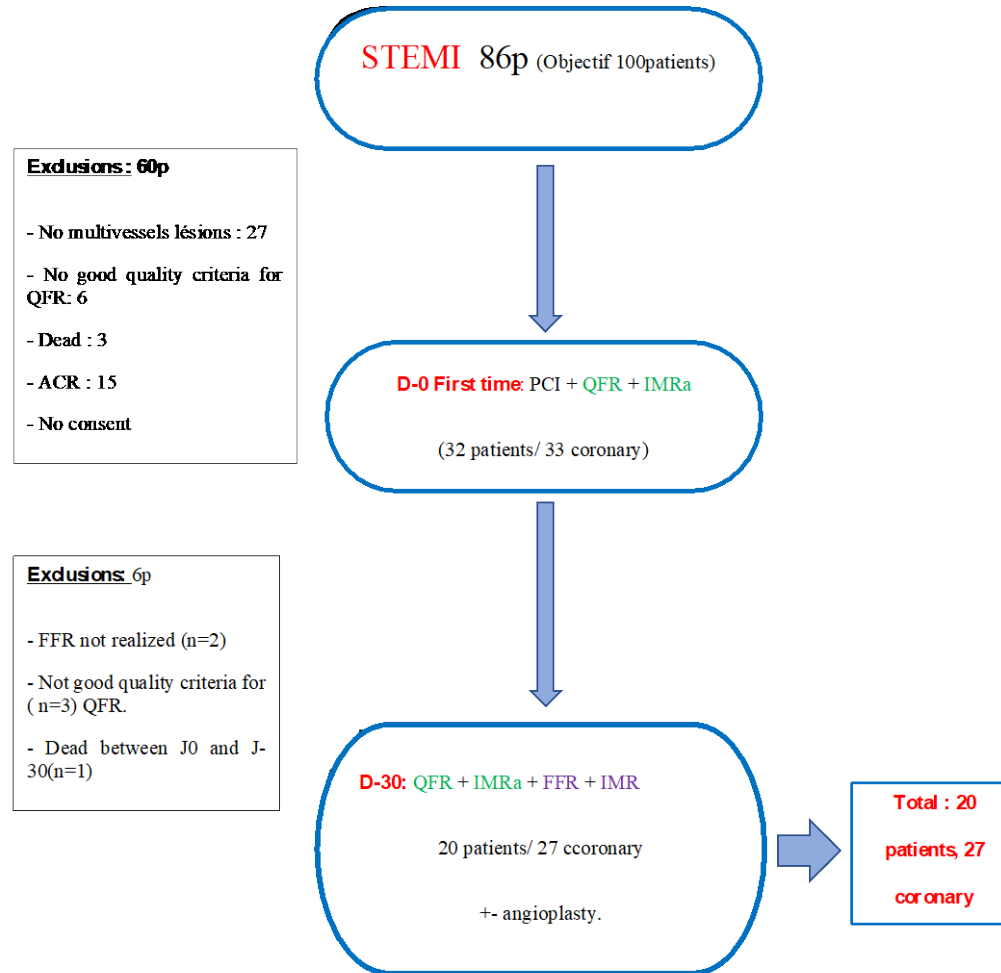
Puymirat NEJM 2021



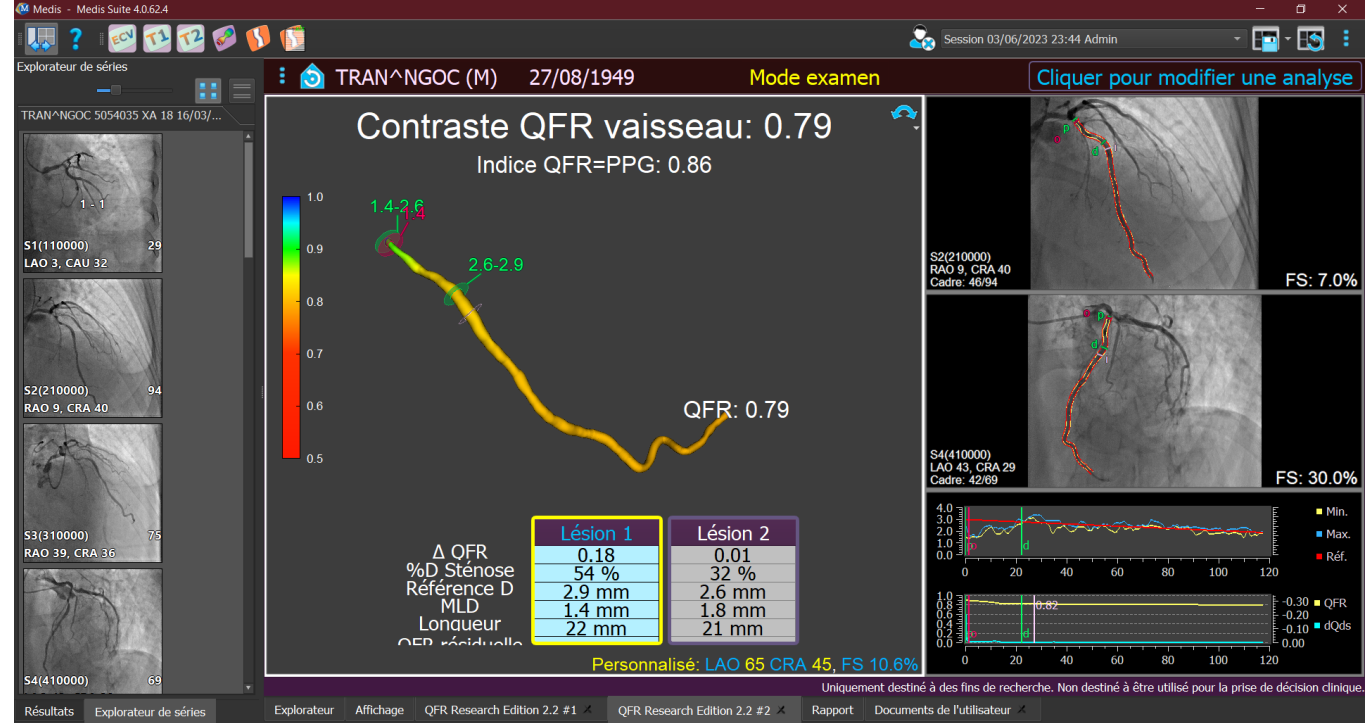
Biscaglia NEJM 2023

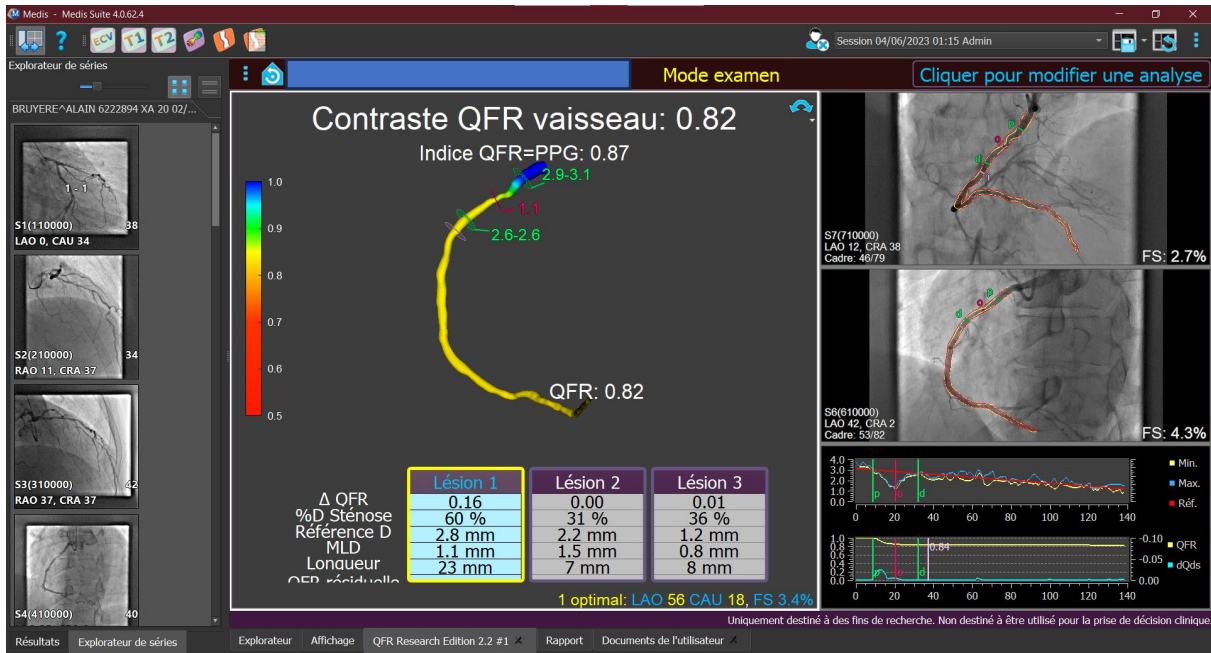
En phase aiguë de STEMI pluritronculaire

Est-ce que la QFR peut éviter des coronarographies + FFR sur les lésions non coupables à J30?

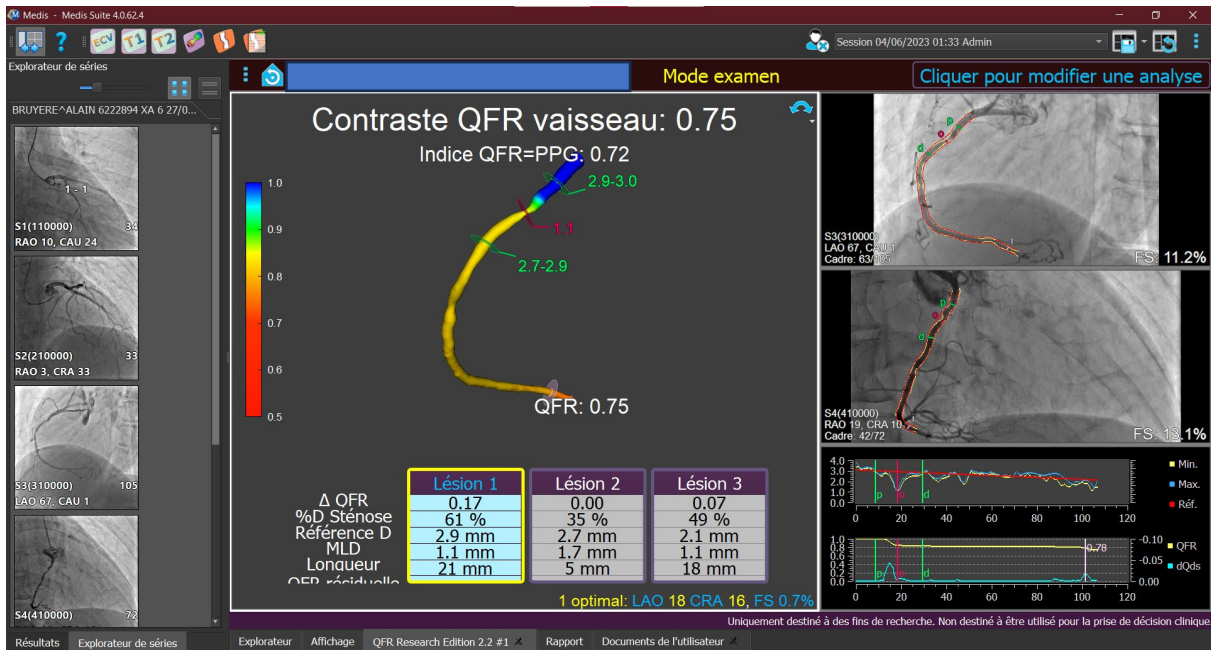








J30



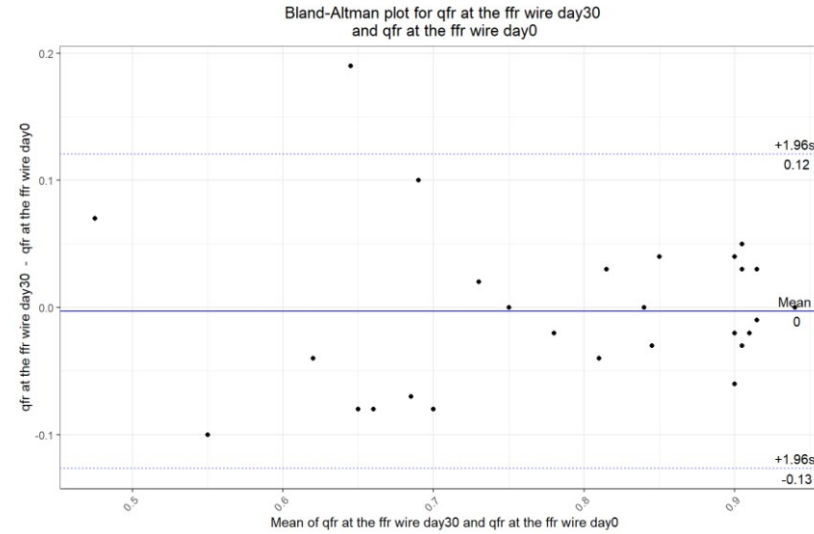
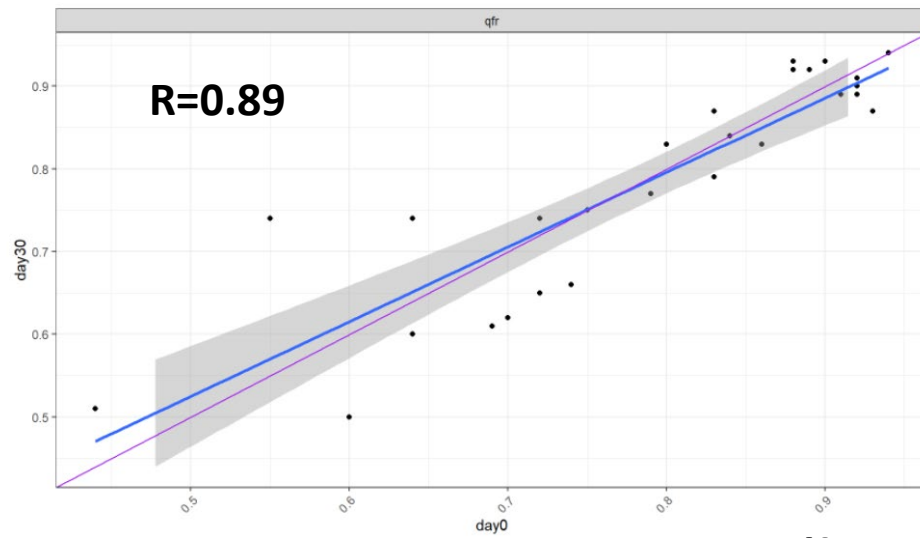
n=20

Baseline population characteristics (n=20)	Value
Age (years)	63,6
Male (%)	85%
Cardiovascular risk factor	
Hypertension	30%
Obesity	20%
Tobacco	60%
Dyslipidemia	70%
Diabetes	20%
Kidney disease (GFR <60 ml/min)	25%
Localisation STEMI	
Antérieur	30%
Inferior	60%
Lateral	10 %
Others characteristics :	
Délai moyen de prise en charge du STEMI	4,35h
Troponin level peak	53228 ng/l (N < 14 ng/l)
Killip > I	10%
3 vessels disease	35%
LVEF J-0	54%
LVEF J-30	57,7%
Table 1: GFR: Glomerular filtration rate, STEMI: ST Segment Elevation Myocardial Infarction, LVSF: Left ventricular systolic function.	

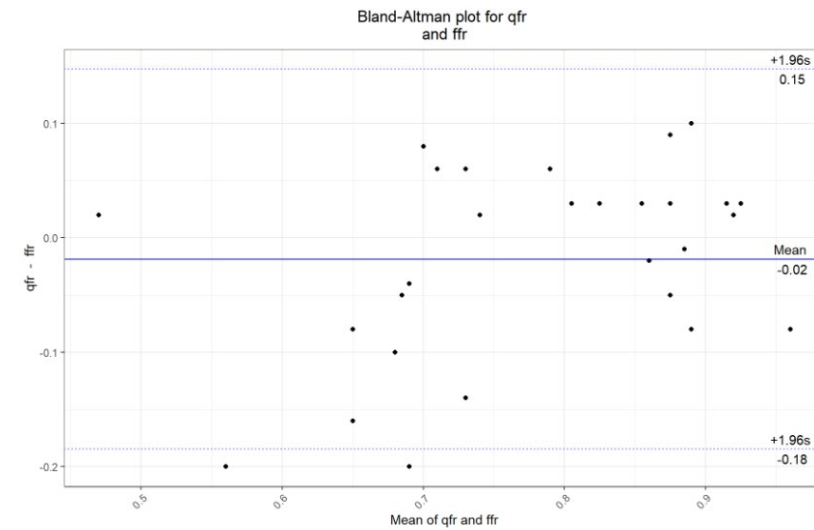
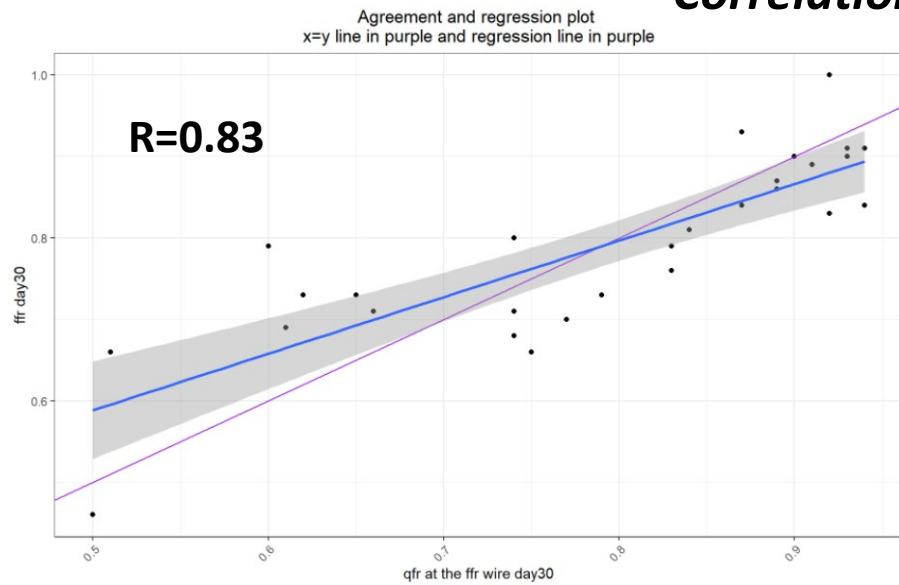
n=27

Baseline vessel characteristics per vessel analysis (n = 28)		Value Day-0	Value Day-30
Target vessel	LAD (Left Anterior descending)	37% (10/27)	
	LCA (Left circumflex)	33,3% (9/27)	
	Diagonal branch	0%	
	RC (Right coronary)	29,63% (8/27)	
Localization stenosis	Proximal	33,3% (9/27)	
	Mild	59,26% (16/27)	
	Distal	7,4% (2/27)	
	Reference diameter +- SD (RSD)	2,72 +- 0,68 (25%)	2,75 +- 0,55 (20%)
	Minimum lumen diameter MLD +- SD (RSD)	1,36 +- 0,50 (37%)	1,29 +- 0,50(39%)
Image quality	Perfect (%)	59,25% (16/27)	64,3% (18/28)
	Good (%)	33,3% (9/27)	32,1 (9/28)
	Limited (%)	7,4% (2/27)	3,6% (1/28)
QFR	Mean (+- SD) (RSD)	0,786 +- 0,13 (16%)	0,789 +- 0,13 (17%)
	< 0,78	40,7% (11/27)	
FFR (Day 30)	Mean (+- SD) (RSD)	0,789 +- 0,11 (14,3%)	
	< 0,80	53,6 (15/28)	

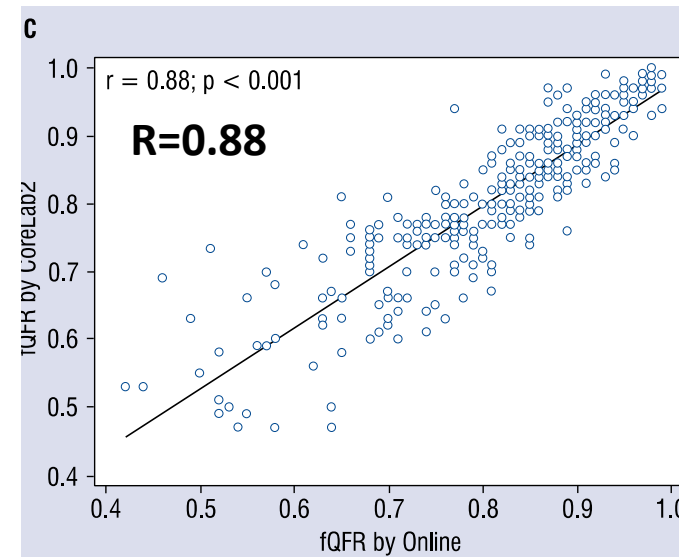
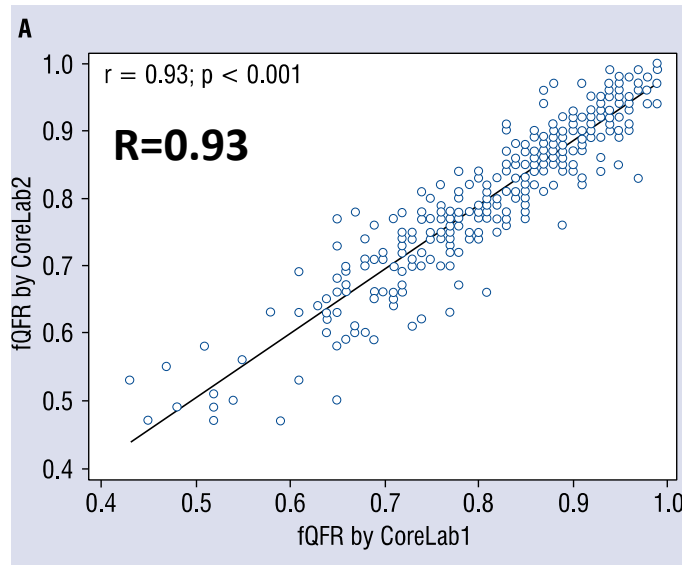
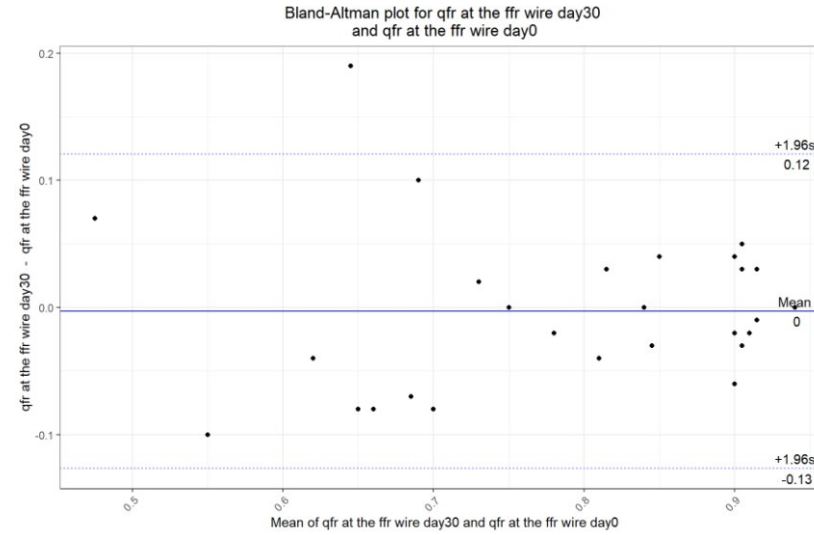
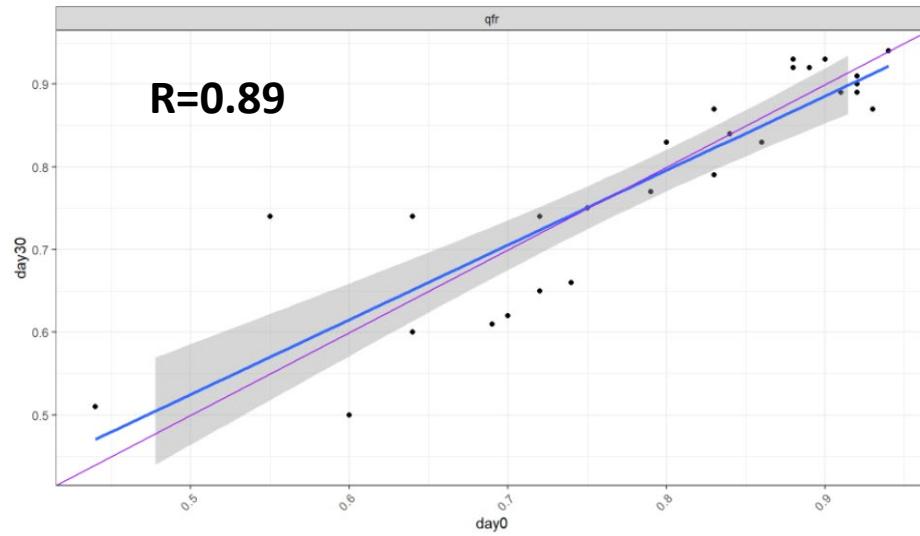
Corrélation QFR J0-J30



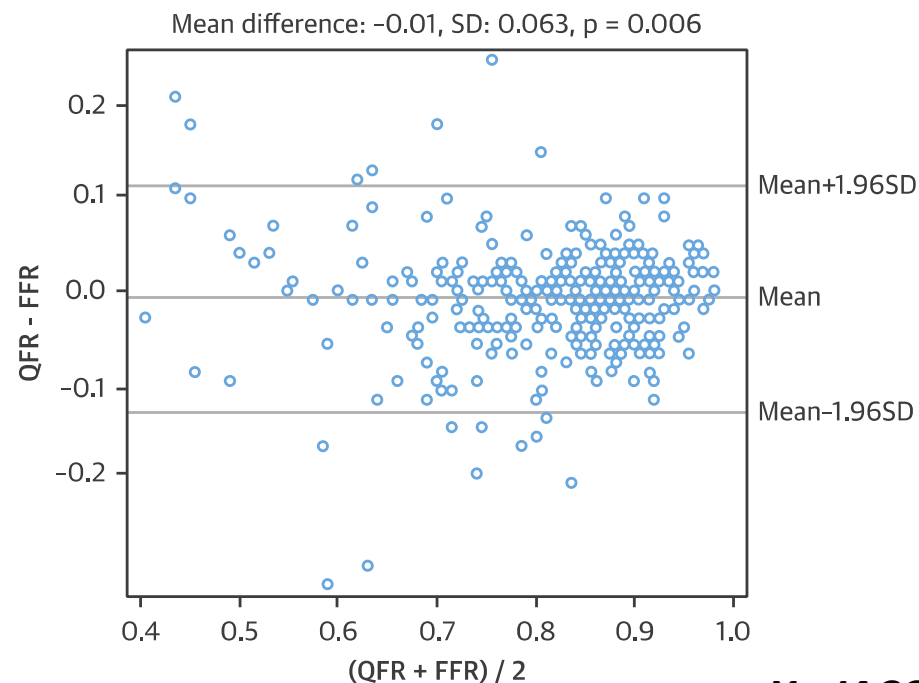
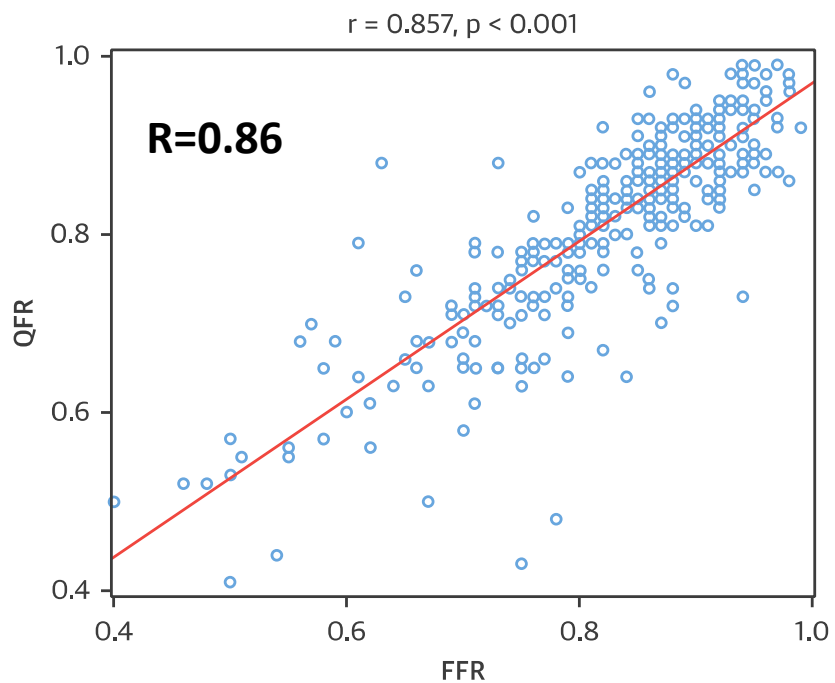
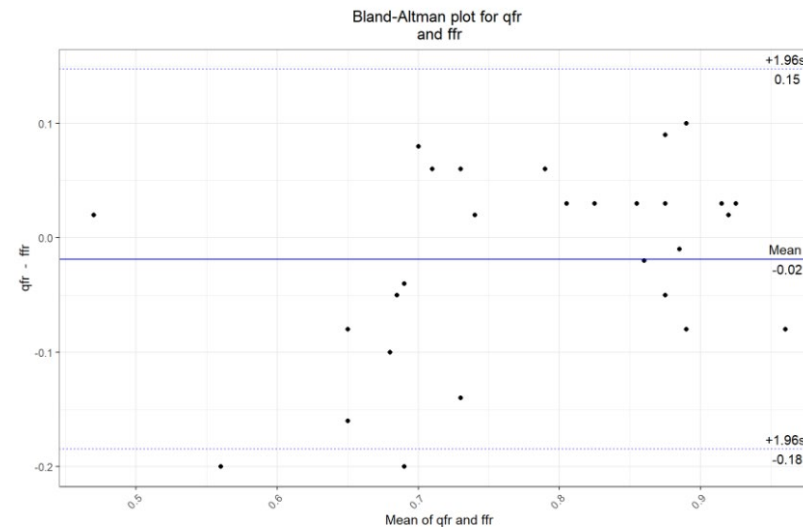
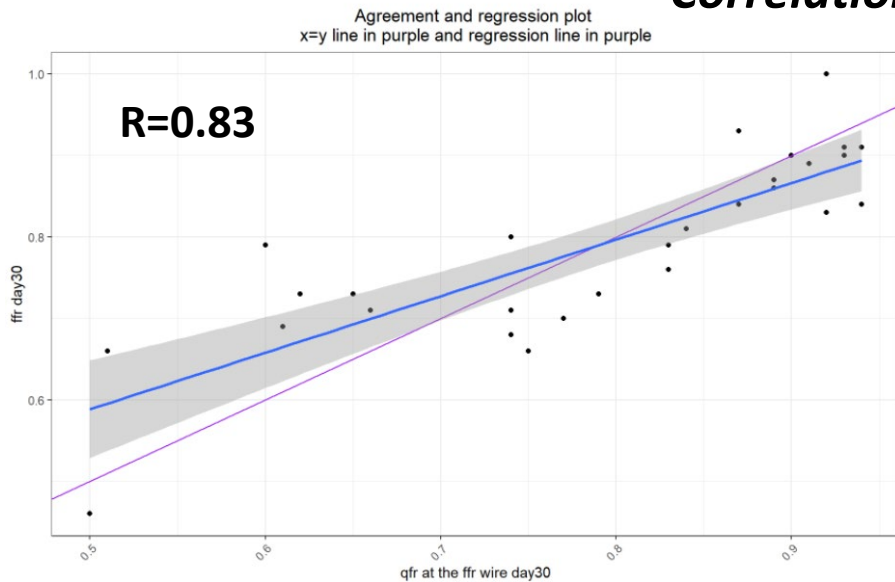
Corrélation QFR J30 – FFR J30



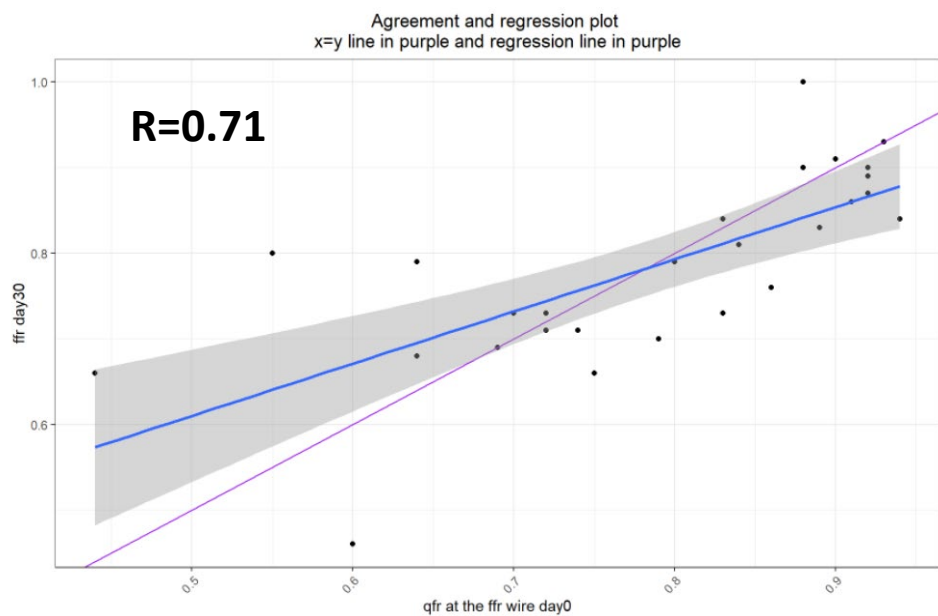
Corrélation QFR J0-J30



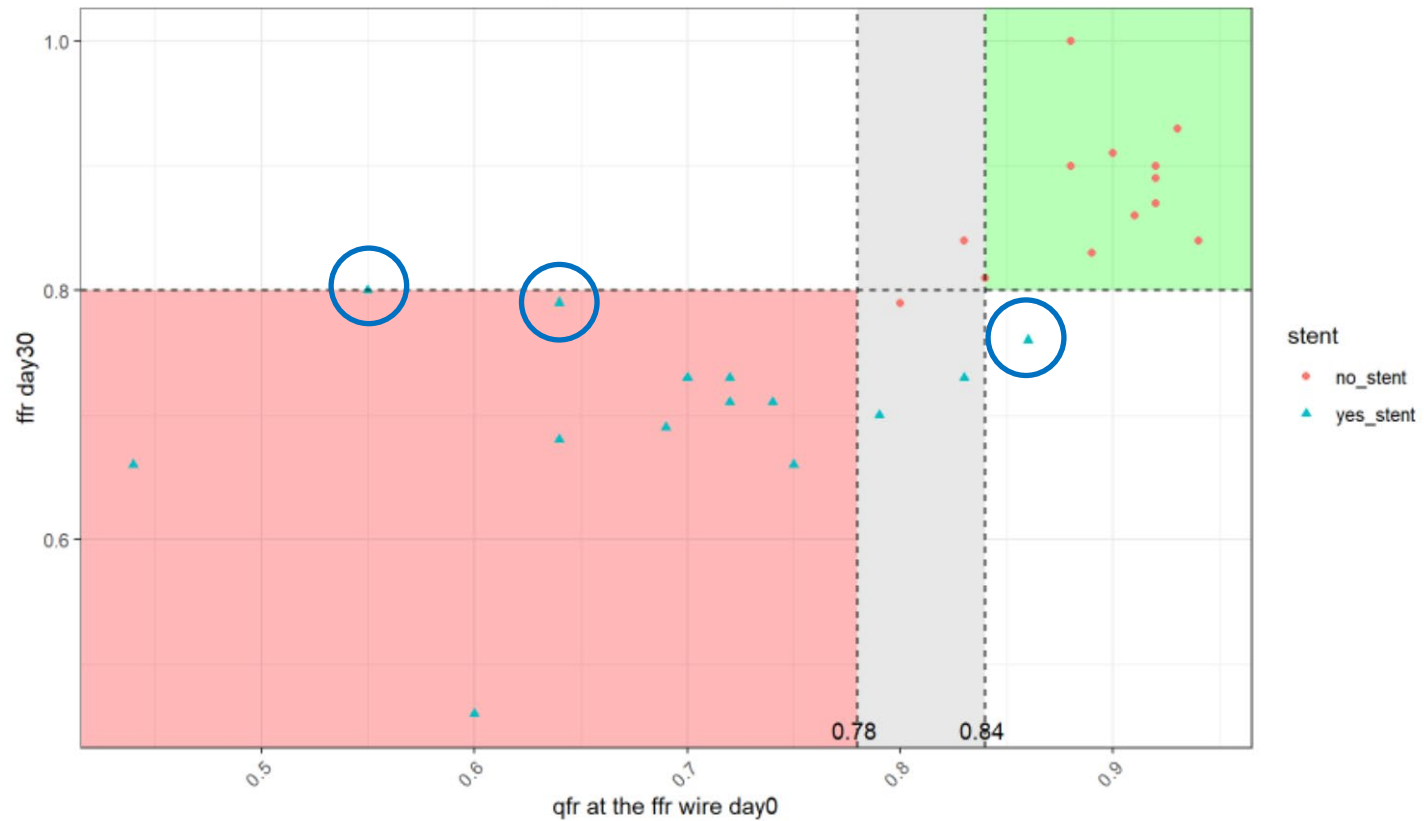
Corrélation QFR J30 –FFR J30



Corrélation QFR J0 –FFR J30



Classification between
ffr day30 and
qfr at the ffr wire day0



Gray-zone 5/27=18.5%

Discordance 3/27= 11%

	FFR	QFR
Anatomy	—	+ +
myocardial mass	+	—
collaterals	+	—
diffuse dis	+	—
hyperhemia	+	—
physiology	+	<u>+</u>
reproductibility	+ +	+
simplicity	<u>+</u>	+
clinical	+ <u>+</u>	<u>+</u> +

CONCLUSIONS ?

