

# FUNDAÇÃO UNIVERSITÁRIA DE CARDIOLOGIA INSTITUTO DE CARDIOLOGIA DO RS



Av. Princesa Isabel, 395 – Porto Alegre - RS – Brasil  
Telefone: (51) 3230 3600

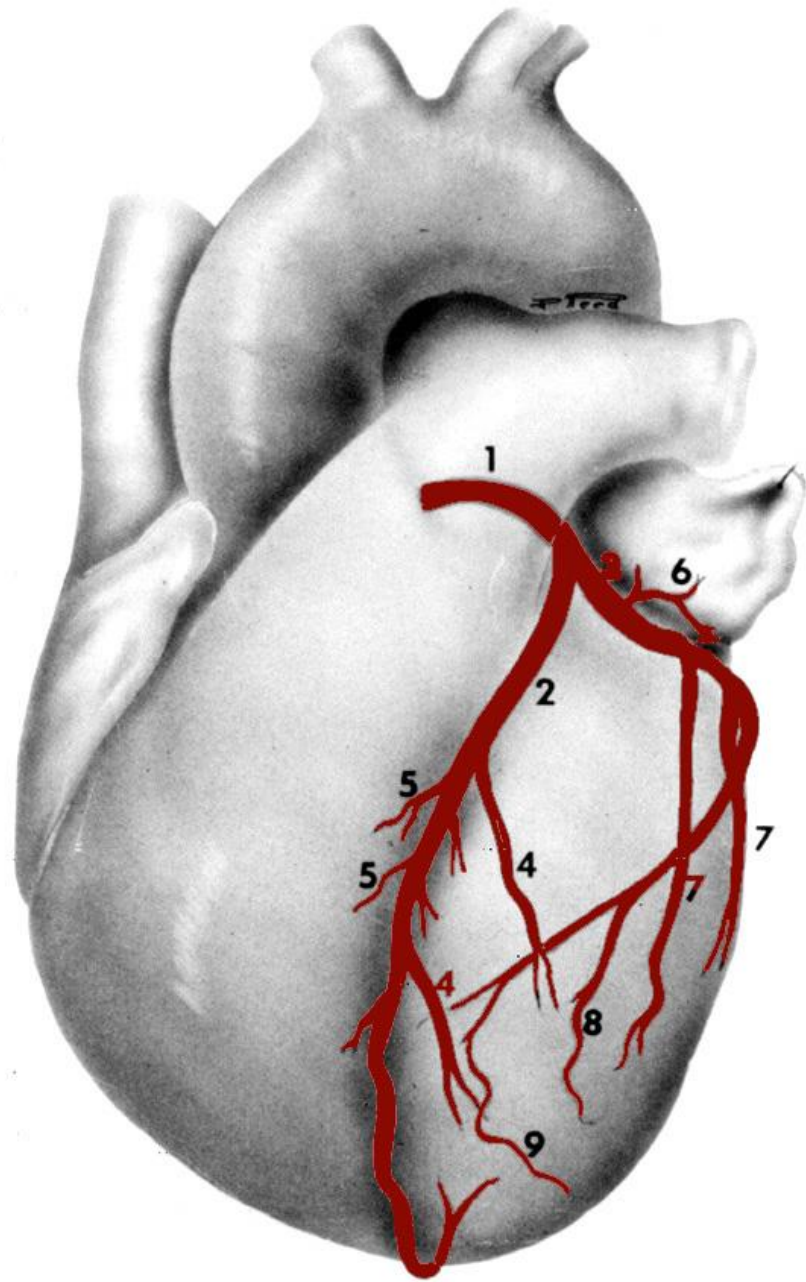
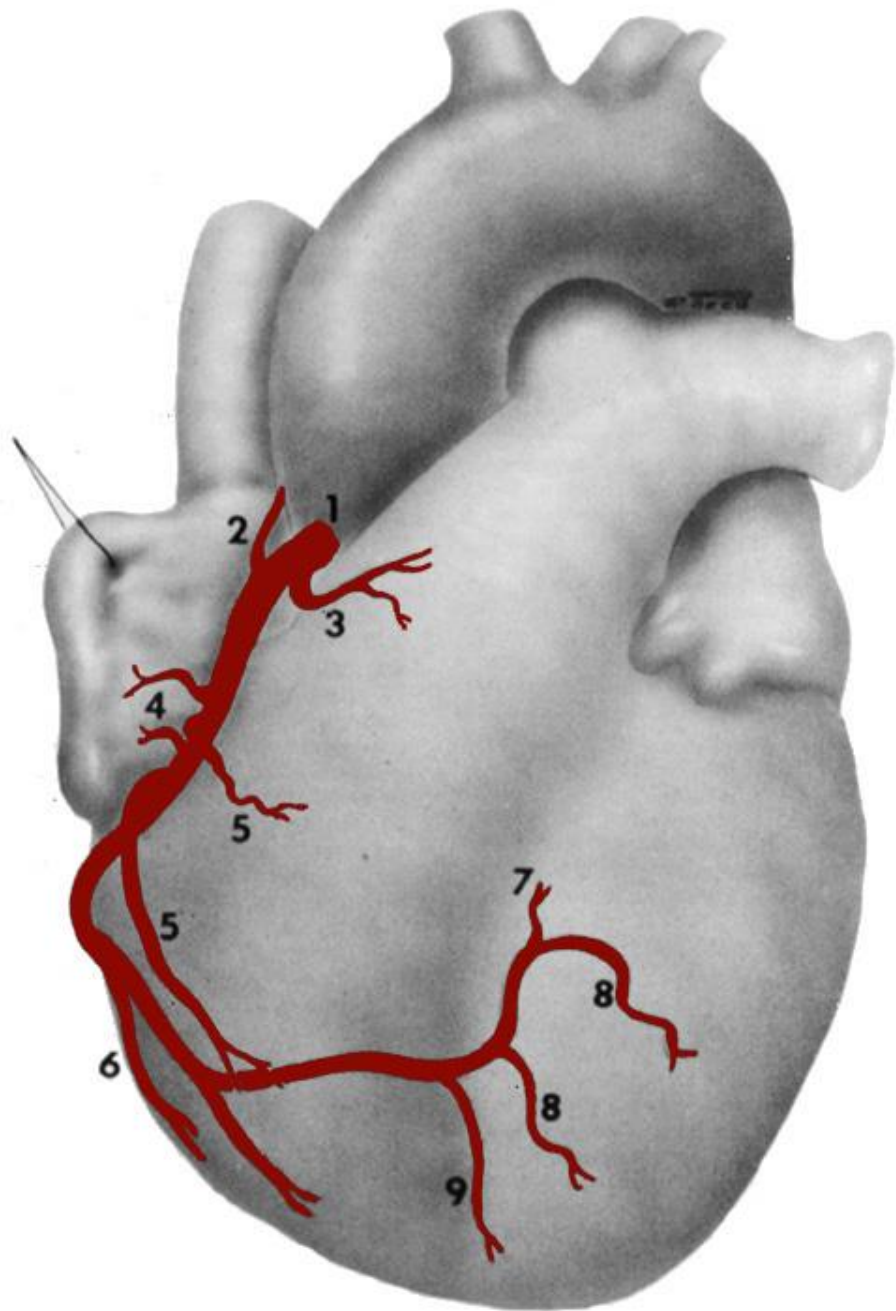
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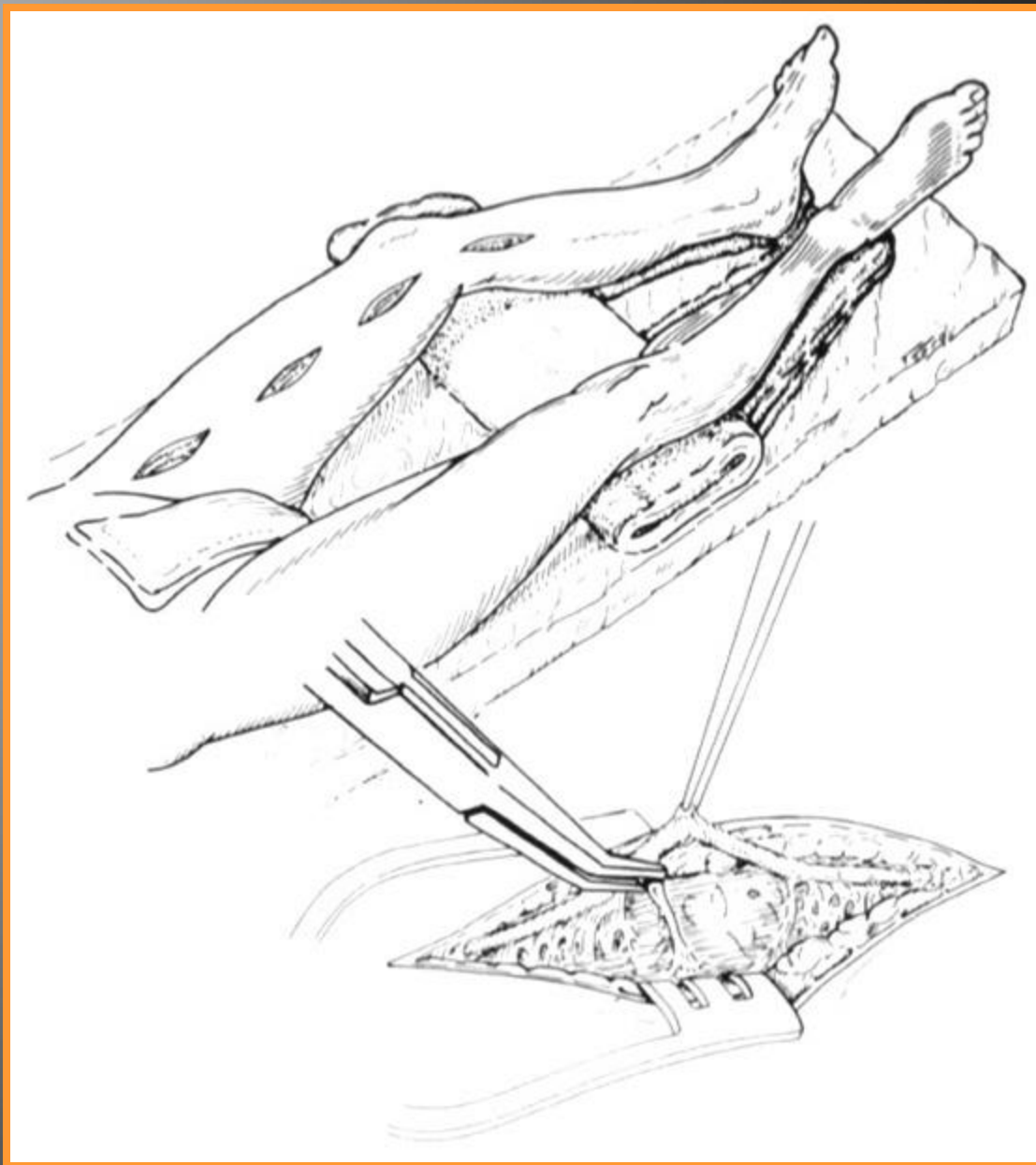
# Cirurgia de Revascularização Miocárdica

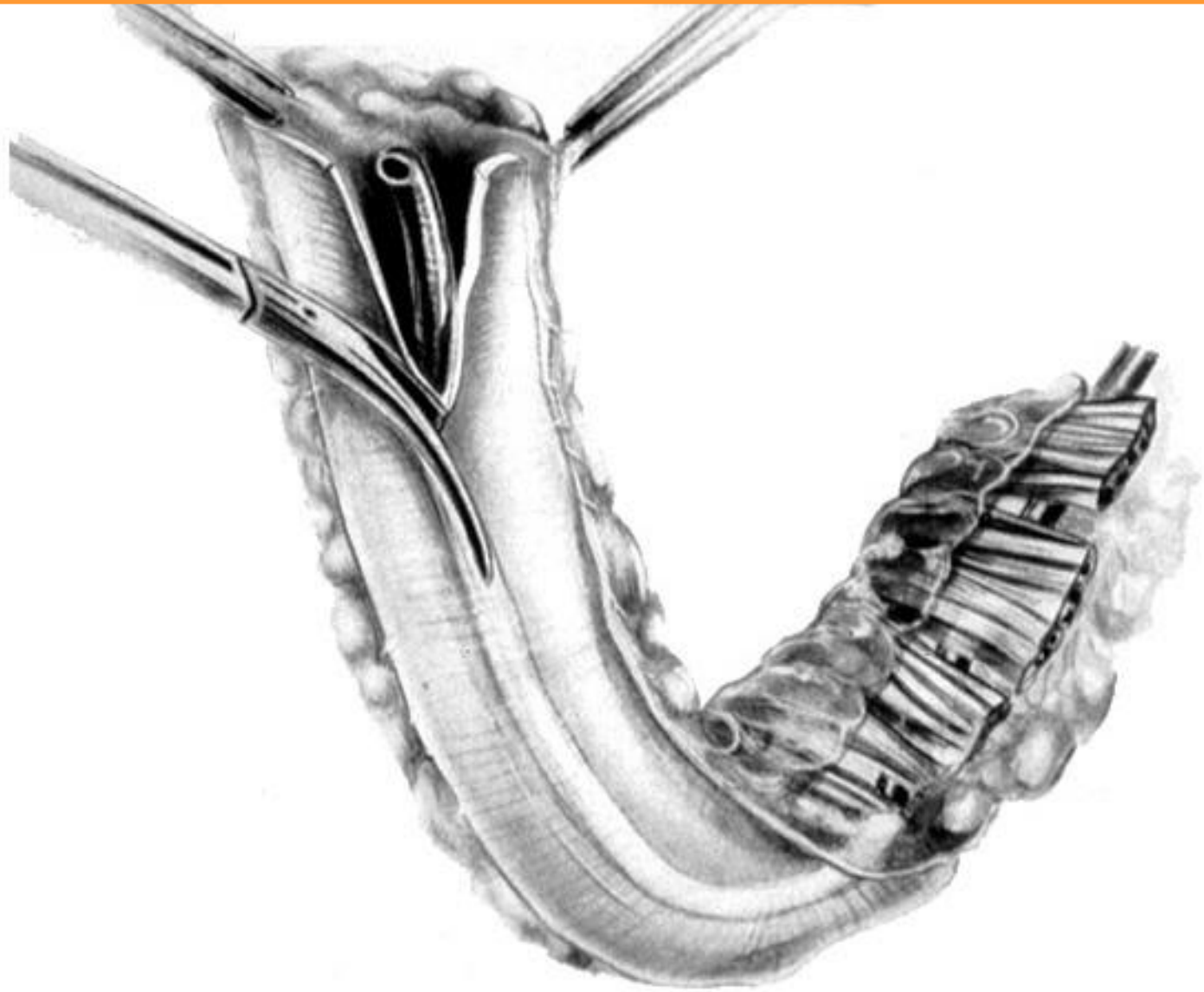
Renato A.K. Kalil

[kalil@cardiologia.org.br](mailto:kalil@cardiologia.org.br)



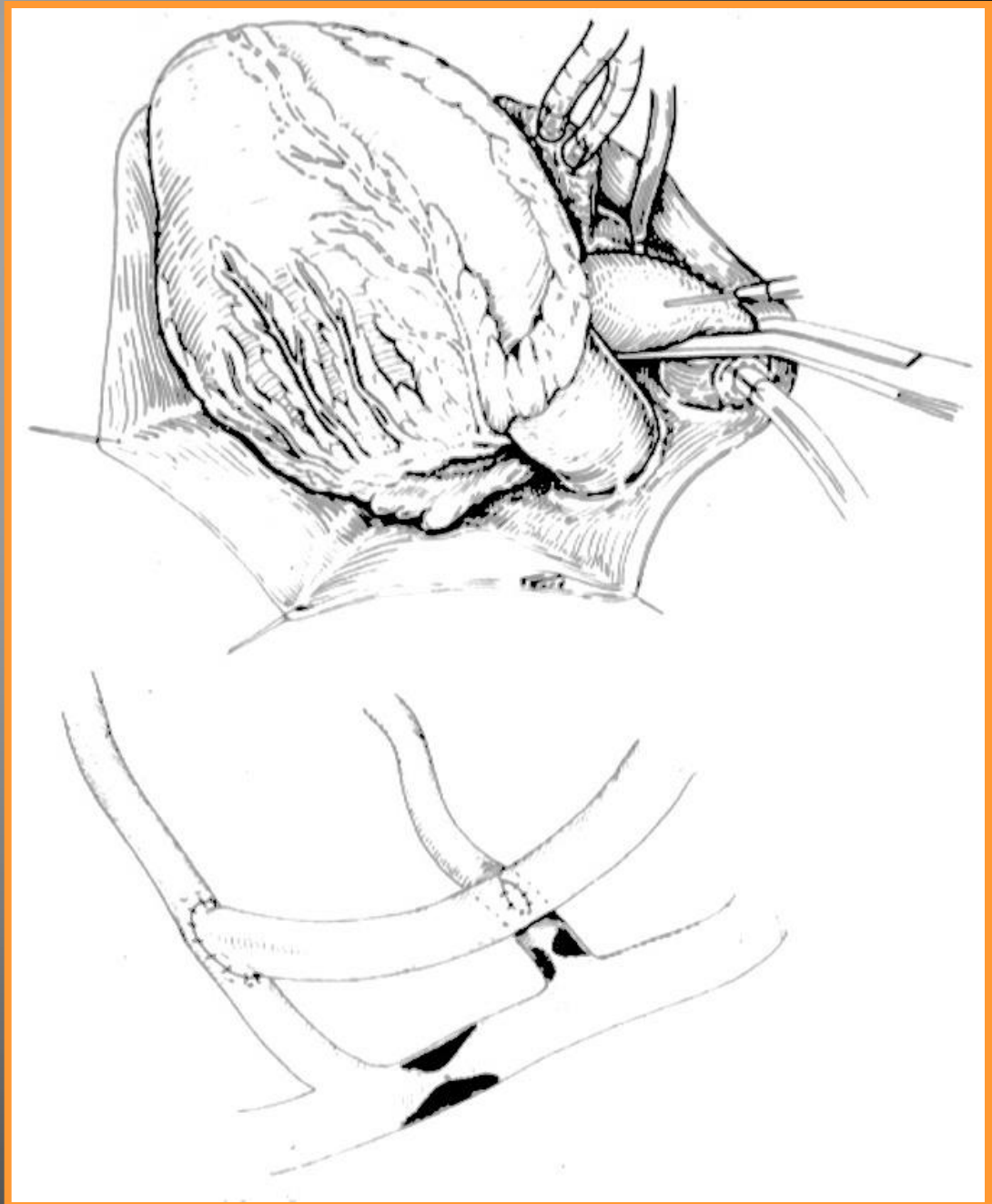
The long saphenous vein is procured through multiple incisions. The vein specimen is not stretched or distended and is grasped only by the adventitia. The inset shows the venous tributaries ligated by hemoclips. A foam rubber pad placed underneath the knee laterally prevents injury to the peroneal nerve



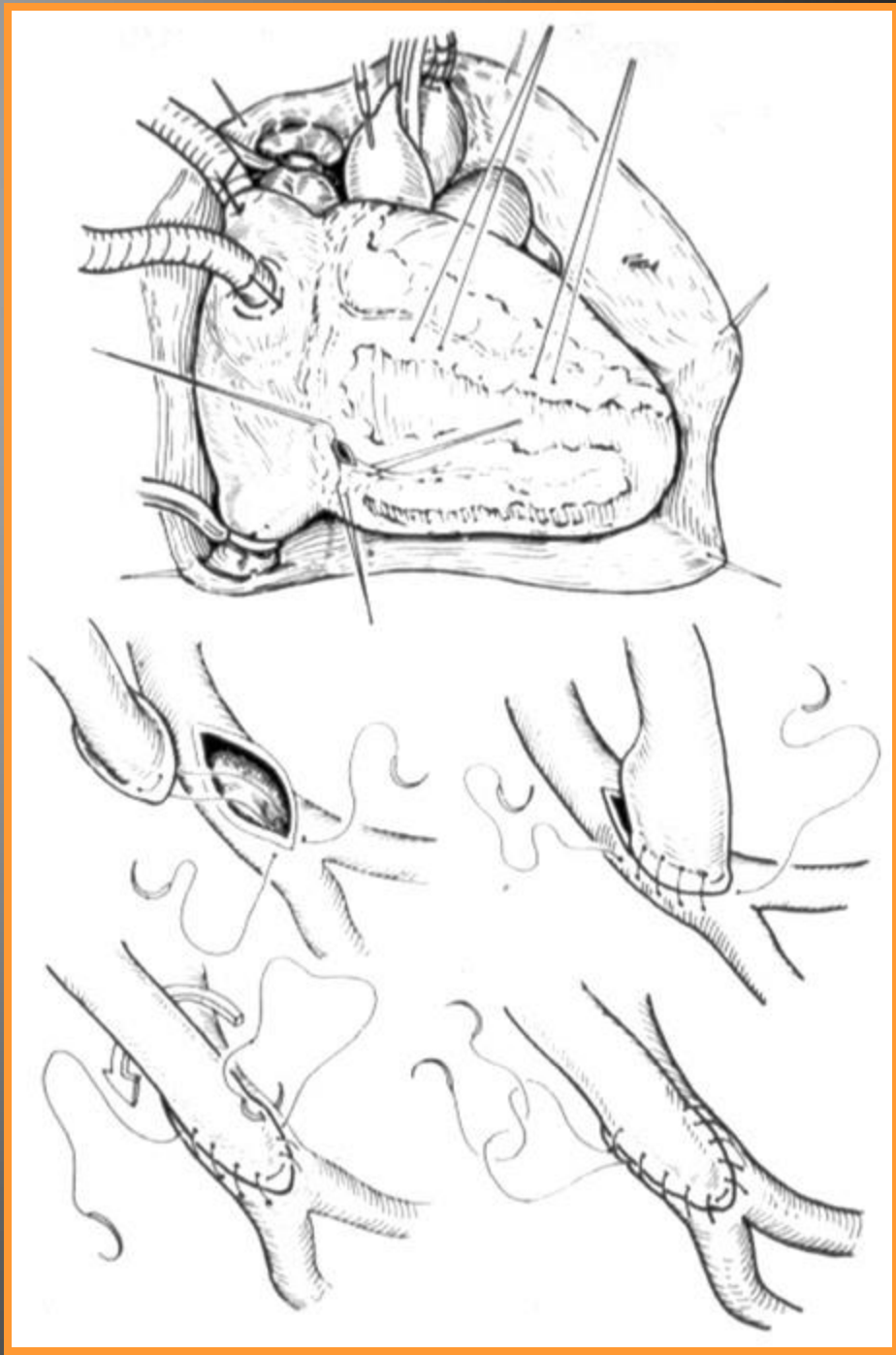


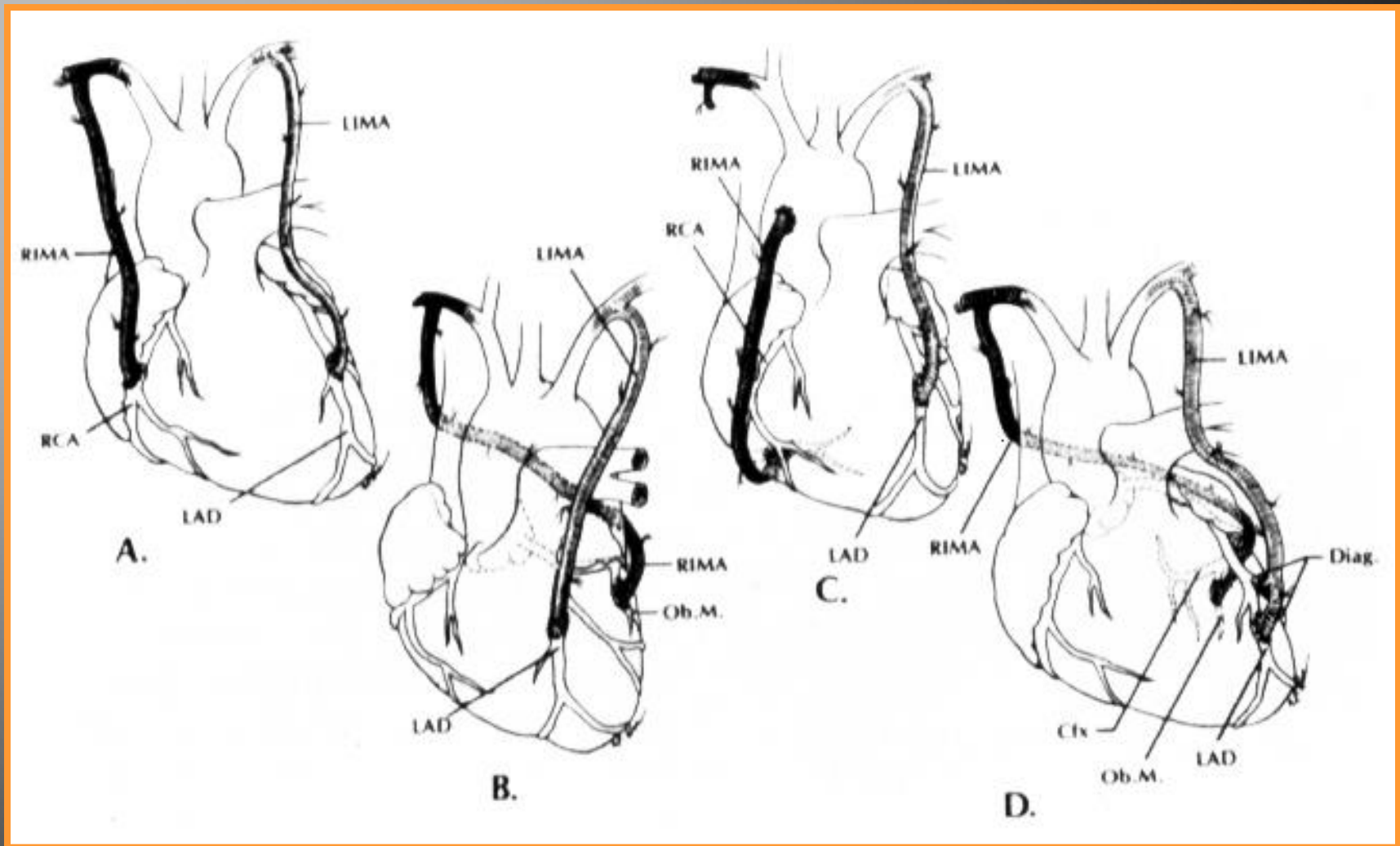
Sequential or bridge grafts are applied mainly to parallel branches of the circumflex. The side-to-side component is performed first using interrupted 7-0 silk sutures followed by the end-to-side anastomosis with interrupted 6-0 silk sutures. The surgeon must angle the venotomy appropriately according to the direction of the first branch.

To prevent dimpling at the side-to-side anastomosis, no more than one-third of the vein circumference must be opened.



Generally, the running technic is used in the larger vessels, notably the distal right coronary artery. We begin the anastomosis with a horizontal mattress suture from vein through recipient artery at the toe of the graft. This method of small-vessel anastomosis secures the critical angle first.





The four diagnosis (A B C and D) illustrate the expanded applicability of IMA grafts  
 LIMA=left internal mammary artery ; RIMA=right internal mammary artery; RCA=right coronary artery; LAD=left anterior descending artery; ObM=obtuse marginal branch; Cfx=circumflex artery; Diag=diagonal branch.



# Cirurgia de Revascularização Miocárdica

## Tipos de enxerto

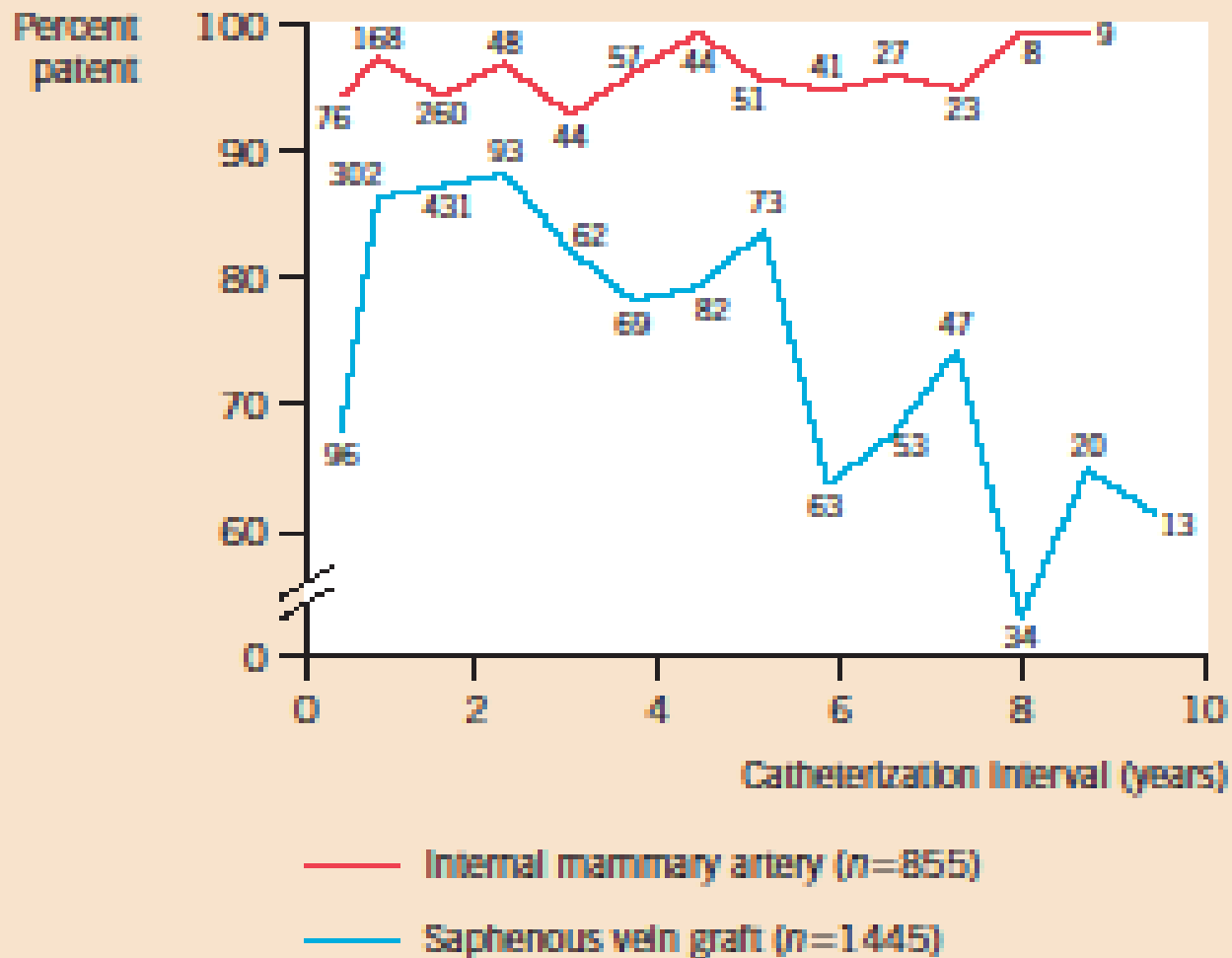
### Preferenciais

**Artéria mamária interna E**  
**Veia safena magna**

### Alternativos

**Artéria mamária interna D**  
**Veia safena parva**  
**Artéria radial**  
**Outras artérias**

## PATENCY RATES IN IMA AND SAPHENOUS VEIN GRAFTS



# Indicações para CRM

- ▣ **para alívio dos sintomas**
- ▣ **para prolongar a vida**
- ▣ **Condições:**
- ▣ **avaliar risco cirúrgico (variável)**
- ▣ **estimar nível potencial de atividade**

**p.o.**

# Indicações para CRM

## Assintomáticos ou Angina leve

1. **Lesão TCE ou equivalente (DA+Cx)**
2. **Lesões em 3 vasos (CD+DA+Cx)**
3. **Lesão DA proximal com isquemia documentada**

# Indicações para CRM

## Angina Estável

1. **Lesão TCE ou equivalente (DA + Cx)**
2. **Lesões 3 vasos ( maior benefício se  $FE < 50\%$ )**
3. **Lesões 2 vasos incluindo DA e  $FE < 50\%$  ou isquemia comprovada**
4. **Lesões 2 vasos sem DA, mas grande área sob risco**
5. **Se angina refratária a tratamento não invasivo**
6. **Lesão DA com isquemia ou  $FE < 50\%$**
7. **Lesão 1-2 vasos sem DA, mas grande área em risco**

# Indicações para CRM

## Angina Instável / IM sem supra ST

1. **Lesão TCE ou equivalente (DA+Cx)**
2. **Angina progressiva ou refratária**
3. **Lesões 2 vasos c/ DA proximal**
4. **Lesões 2 vasos sem DA e grande área em risco**

# Indicações para CRM

## IAM / IM com supra ST

### Cirurgia de emergência:

1. **ACTP sem sucesso + angina / instabilidade I**
2. **Isquemia persistente + ACTP inviável I**
3. **Complicações mecânicas (IM, CIV) I**
4. **Choque cardiogênico I**
5. **Arritmia ventricular maligna + lesão TCE ou 3 vasos I**
6. **Como reperfusão primária IIa**
7. **Após o 7º dia pós IAM: indicação pelos critérios de angina IIa**

# Indicações para CRM

## Arritmia Ventricular Maligna

- 1. Causada por lesão TCE ou 3 vasos**
- 2. TV sustentada ou pós-PCR, em lesão 1-2 vasos com ou sem DA**



# Cirurgia no Infarto Agudo do Miocárdio

Reperusão

Primária

Pós-ACTP  
e/ou Trombólise

Trat. Complicações

An. VE

CIV

IM

Ruptura externa

Choque Cardiogênico

# The Cleveland Clinic – Clinical Severity Scoring System

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<b>Preoperative Factors</b>	<b>Score</b>
<b>Emergency case</b>	<b>6</b>
<b>Serum creatinine (mg/dL)</b>	
<b>≥ 1.6 and &gt; 1.8</b>	<b>1</b>
<b>≥ 1.9</b>	<b>4</b>
<b>Severe LVD</b>	<b>3</b>
<b>Reoperation</b>	<b>3</b>
<b>Operative mitral valve insufficiency</b>	<b>3</b>
<b>Age ≥ 65 and ≥ 74 years</b>	<b>1</b>
<b>Age ≥ 75 years</b>	<b>2</b>
<b>Prior vascular surgery</b>	<b>2</b>

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# The Cleveland Clinic – Clinical Severity Scoring System

Higgins TL et al. JAMA 267:2345, 1992.

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Preoperative Factors	Score
Chronic obstructive pulmonary disease	2
Anemia (hematocrit < 34%)	2
Operative aortic valve stenosis	1
Weight (< 65kg)	1
Diabetes (oral or insulin therapy)	1
Cerebrovascular disease	1

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*Outros Escores:*

STS: [www.sts.org](http://www.sts.org)

*EUROSCORE*

## Risk models to assess short-term (in-hospital or 30-day) outcomes

Score	Development cohort (patients, design)	Patient inclusion	Coronary procedures	Number of variables		Outcome	Recommendation		Validation studies	Calculation	Ref <sup>a</sup>
				Clinical	Anatomical		CABG	PCI			
STS Score	n = 774 881 Multicentre	01/2006 – 12/2006	100% (i)CABG	40	2	In-hospital or 30-day <sup>b</sup> mortality, and in-hospital morbidity <sup>c</sup>	<b>I B</b>		5–10	<a href="http://riskcalc.sts.org">http://riskcalc.sts.org</a>	15, 16
EuroSCORE II	n = 16 828 Multicentre	05/2010 – 07/2010	47% (i)CABG	18	0	In-hospital mortality	<b>IIa B</b>	<b>IIb C</b>	>10	<a href="http://www.euroscore.org/calc.html">www.euroscore.org/calc.html</a>	11
ACEF	n = 4 557 Single-centre	2001 – 2003	-	3	0	In-hospital or 30-day <sup>b</sup> mortality	<b>IIb C</b>	<b>IIb C</b>	5–10	[Age/ejection fraction (%)] + 1 <sup>d</sup>	22
NCDR CathPCI	181 775 Multicentre	01/2004 – 03/2006	100% PCI	8	0	In-hospital mortality		<b>IIb B</b>	<5	-	21
EuroSCORE	n = 19 030 Multicentre	09/1995 – 11/1995	64% (i)CABG	17	0	Operative mortality	<b>III B</b>	<b>III C</b>	>50	<a href="http://www.euroscore.org/calcold.html">www.euroscore.org/calcold.html</a>	7, 8

ACEF = age, creatinine, ejection fraction; (i)CABG = (isolated) coronary artery bypass grafting; NCDR = National Cardiovascular Data Registry; PCI = percutaneous coronary intervention; STS = Society of Thoracic Surgeons.

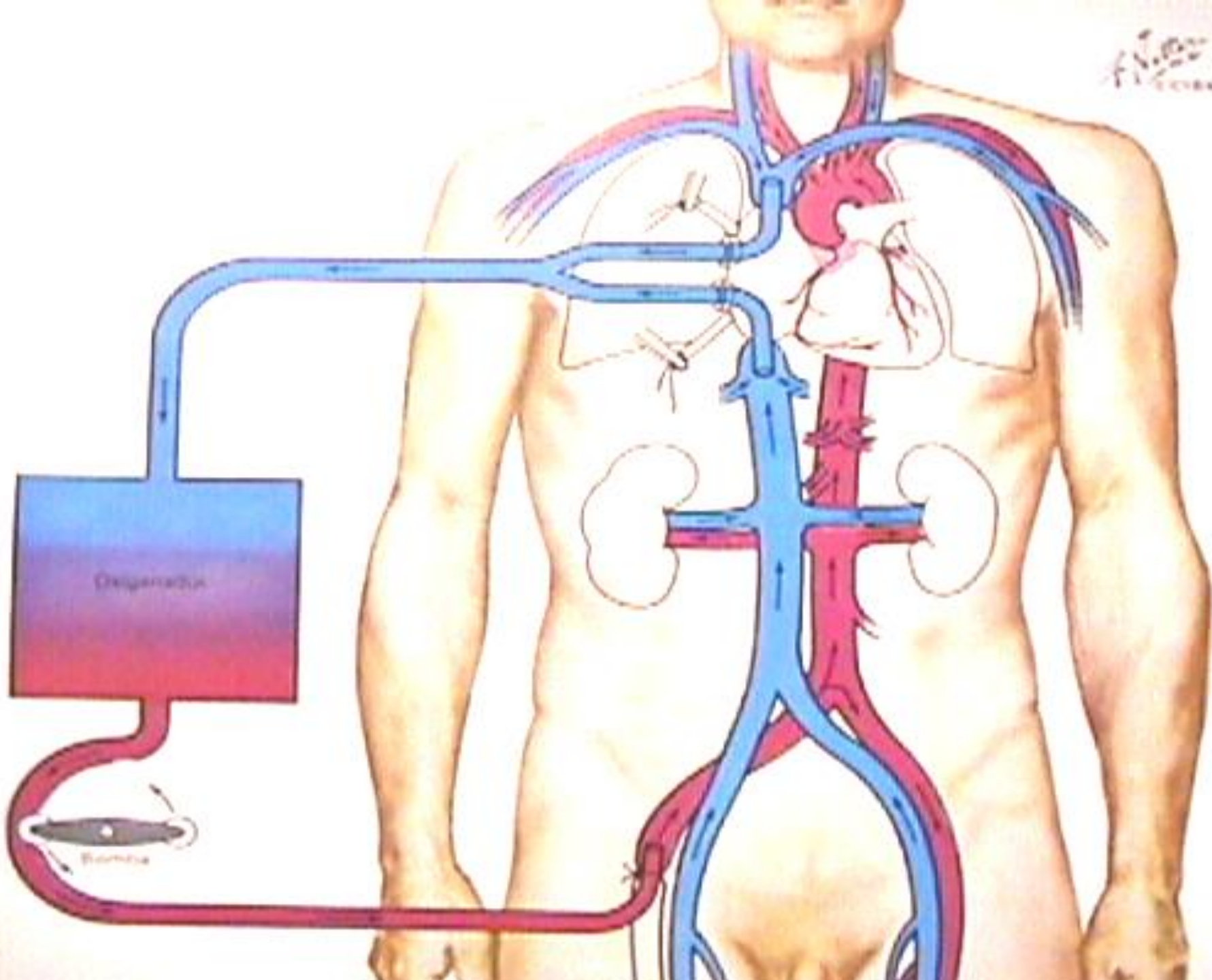
<sup>a</sup>References.

<sup>b</sup>Whichever occurs last.

<sup>c</sup>Permanent stroke, renal failure, prolonged ventilation, deep sternal wound infection, re-operation, length of stay < 6 or > 14 days.

<sup>d</sup>If creatinine is > 2 mg/dL.

Figure 10.1





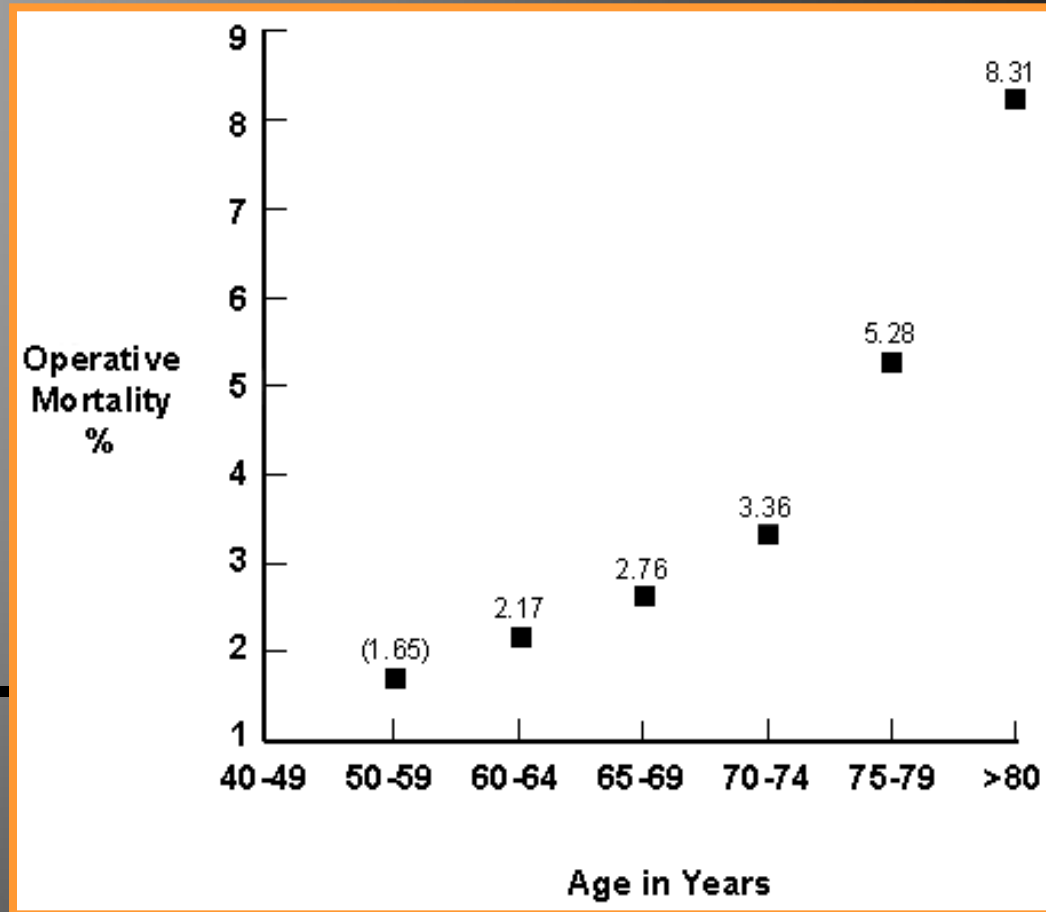
# Cirurgia de Revascularização miocárdica

Sem C.E.C

- ▣ **Possível, mas não melhor**
- ▣ **Vantagens? Teóricas,**
  - **Recuperação rápida (hospital e UTI)**
  - **Função renal**
  - **Dano neurológico**
  - **Transfusão sangüínea**
  - **Reação inflamatória**
- ▣ **Menor número de vasos tratados**
- ▣ **Maior número de reintervenções coronarianas**
- ▣ **Pouca diferença sobrevida a longo prazo**

# Cirurgia de Revascularização miocárdica Idosos

- ▣ Risco pouco aumentado > 70 anos
- ▣ Risco mais aumentado > 80 anos
- ▣ Morbidade: deficit cognitivo, renal
- ▣ Melhora qualidade de vida.

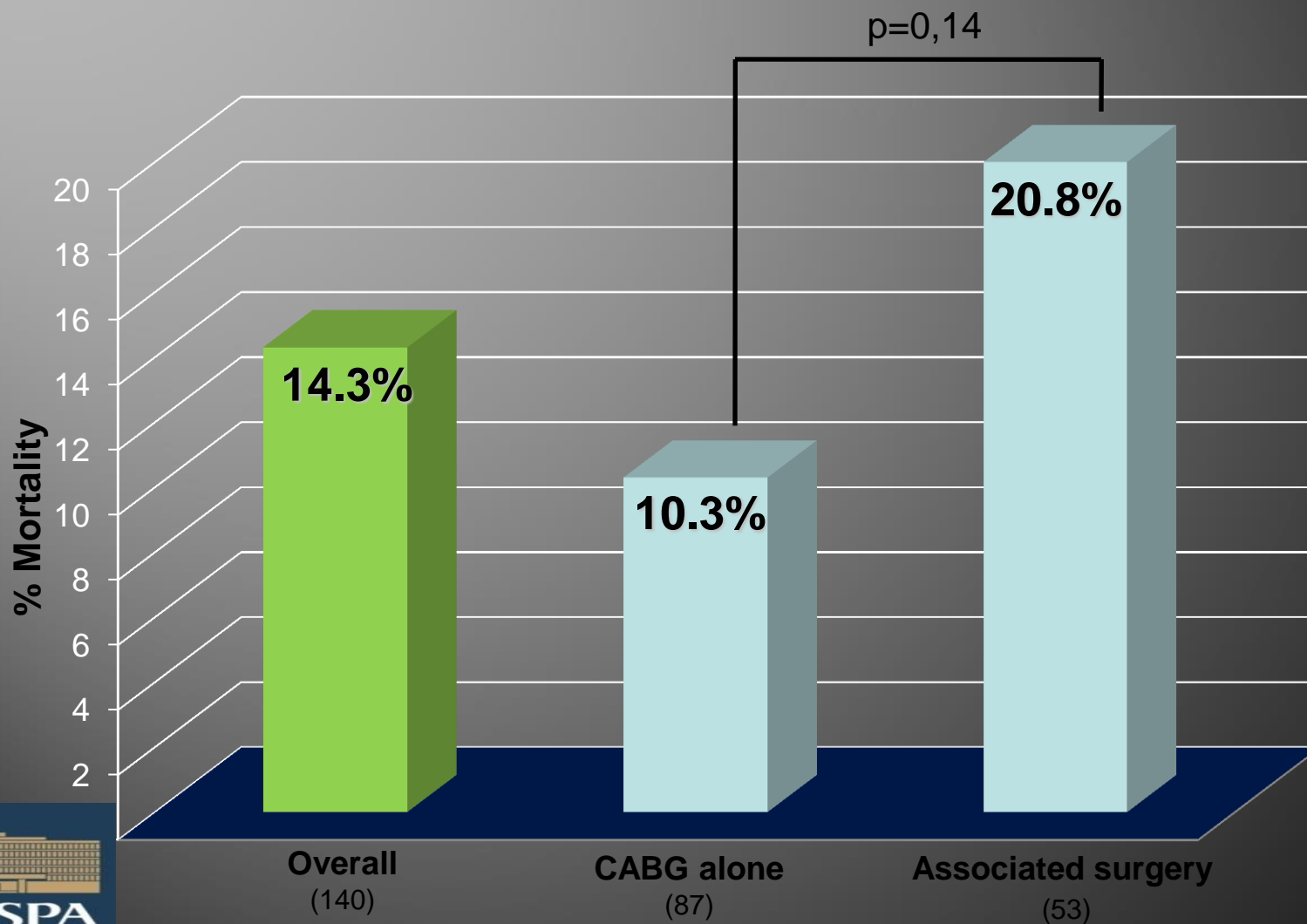


Eagle and Guyton et. al.  
ACCAHA Guidelines for CABG Surgery.  
JACC.1999;34(4):1262-347.



# CABG in octogenarians: Mortality

Instituto de Cardiologia do Rio Grande do Sul  
(140 cases: 2002-2007)



**Table 4.** Outcomes of Cardiac Surgery by Age Category

	CABG Only		CABG/AVR		CABG/MVR	
	Age <80 n = 60,161	Age ≥80 n = 4,306	Age <80 n = 1,690	Age ≥80 n = 345	Age <80 n = 1,170	Age ≥80 n = 92
<b>All Patients</b>						
In-hospital mortality (95% CI)	3.0% (2.9–3.2)	8.1%* (7.3–8.9)	7.9% (6.6–9.2)	10.1% (6.9–13.4)	12.2% (10.3–14.1)	19.6%* (3.5–10.8)
All neurologic events (stroke, TIA, coma)	4.2%	10.2%*	9.1%	15.2%*	11.2%	22.5%*
Stroke only	1.8%	3.9%*	3.2%	4.9%	4.7%	8.8%
Renal failure	2.9%	6.9%*	6.8%	12.1%*	11.4%	25.0%*
Perioperative MI	1.7%	2.5%*	2.0%	3.0%	2.7%	1.5%
PLOS days‡	6 (5,8)	7 (6,11)*	7 (5,10)	9 (6,15)*	9 (6,14)	11 (7,19)
<b>Patients w/o Comorbidity† (% of population)</b>	<b>n = 24,811 (41.2%)</b>	<b>n = 1,588 (36.9%)</b>	<b>n = 571 (33.8%)</b>	<b>n = 100 (29.0%)</b>	<b>n = 196 (16.8%)</b>	<b>n = 11 (12.0%)</b>
In-hospital mortality (95% CI)	1.1% (1.0–1.3)	4.2%* (3.2–5.2)	4.0% (2.4–5.7)	7.0% (1.9–12.1)	7.1% (3.5–10.8)	18.2% n/a

\*p < 0.05 for comparison by age category; †subset of patients without significant comorbidity: EF <35%, prior CABG, Hx CHF, COPD, vascular disease, renal insufficiency, MI within 21 days or emergency surgery (see Methods section); ‡median and 25th and 75th quartiles.

AVR = aortic valve repair; CABG = coronary artery bypass grafting; MI = myocardial infarction; MVR = mitral valve repair or replacement; PLOS = postprocedural length of stay.

# Cirurgia de Revascularização miocárdica

## Lesão Carotídea Associada

- ▣ **Freqüente em lesão TCE**
- ▣ **Pode ser tratada simultaneamente, sem acréscimo de morbi-mortalidade**
- ▣ **Melhor sobrevida a longo prazo quando tratada.**

Use Either Score to Obtain Total Points for Patient

Only Preoperative	Variables	Preoperative and Intraoperative
1 point	Age (for each 5 yrs over 55 yrs)	1 point
4 points	BMI 30–40 kg/m <sup>2</sup>	3 points
9 points	BMI >40 kg/m <sup>2</sup>	8 points
3 points	Diabetes	3 points
4 points	Renal failure	4 points
3 points	Heart failure	3 points
2 points	Peripheral vascular disease	2 points
2 points	Female gender	2 points
2 points	Chronic lung disease	3 points
6 points	Cardiogenic shock	
2 points	Myocardial infarction	
4 points	Concomitant surgery	
	Cardiopulmonary bypass 100–199 min	3 points
	Cardiopulmonary bypass 200–300 min	7 points
	Intra-aortic balloon pump	5 points
Total Points	Probability of Infection	
0–2	≤1.1%	
3–6	1.2%–1.9%	
7–9	2.0%–2.7%	
10–12	3.0%–4.0%	
13–15	4.5%–6.0%	
16–22	6.6%–11.8%	
>22	12.1%–16.2%	

Source: Fowler et al. (12).

BMI = body mass index; CABG = coronary artery bypass graft.

Year in Cardiovascular Surgery

Robert H. Jones  
JACC 2006; 47:2094–107

**Table 5.  
Prediction of Major Infection After CABG Using Only Preoperative Variables or Preoperative and Intraoperative variables**

# Cirurgia de Revascularização miocárdica

## CRM e ACTP

- ❖ **Meta-análise de 4 trials (ARTS, ERACI-2, SOS, MASS-2)**
  - **Sem diferença para sobrevida, IAM ou AVC, em 1 ano**
  - **Re-intervenção: CRM= 4,4% X ACTP= 18%,  $p < 0,001$**
  - **Favorecer CRM em diabetes mellitus**

# Resultados Comparativos CRM X Stent

## 4 ensaios clínicos randomizados

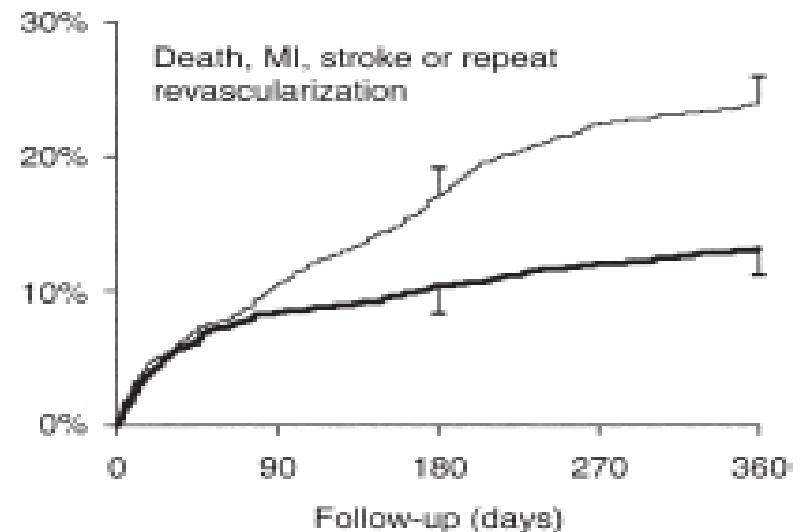
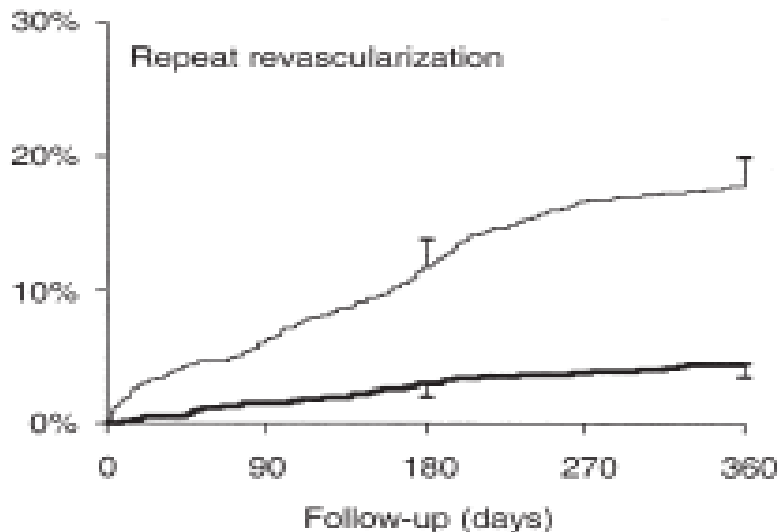
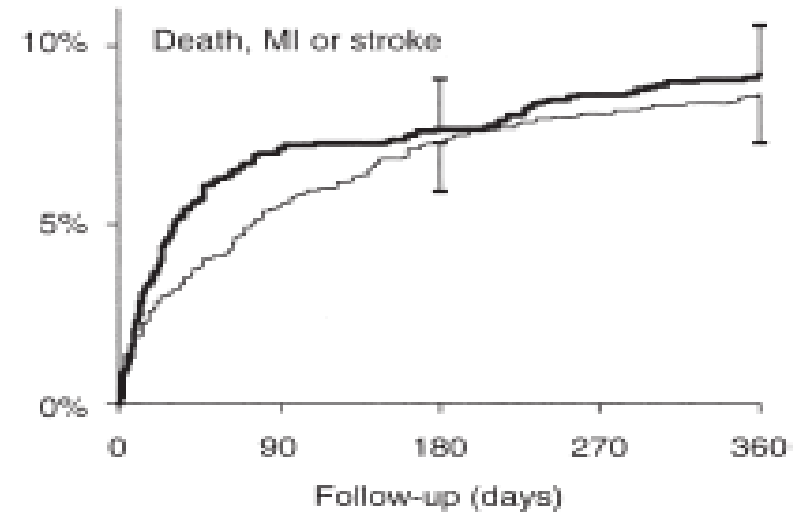
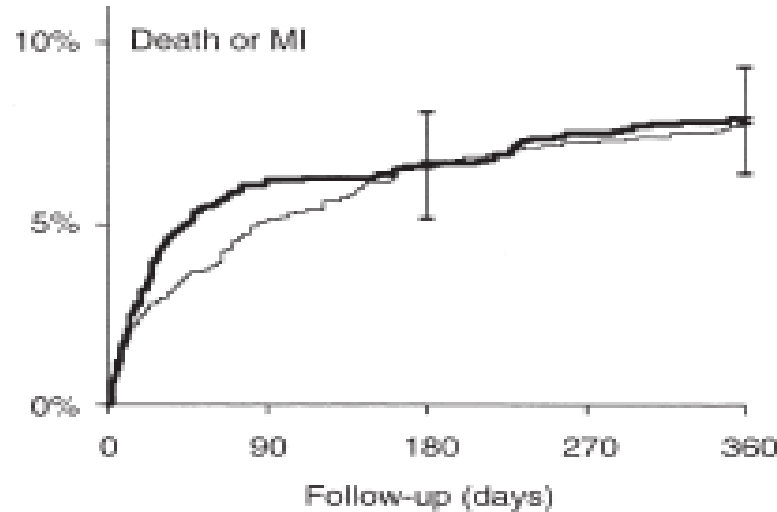
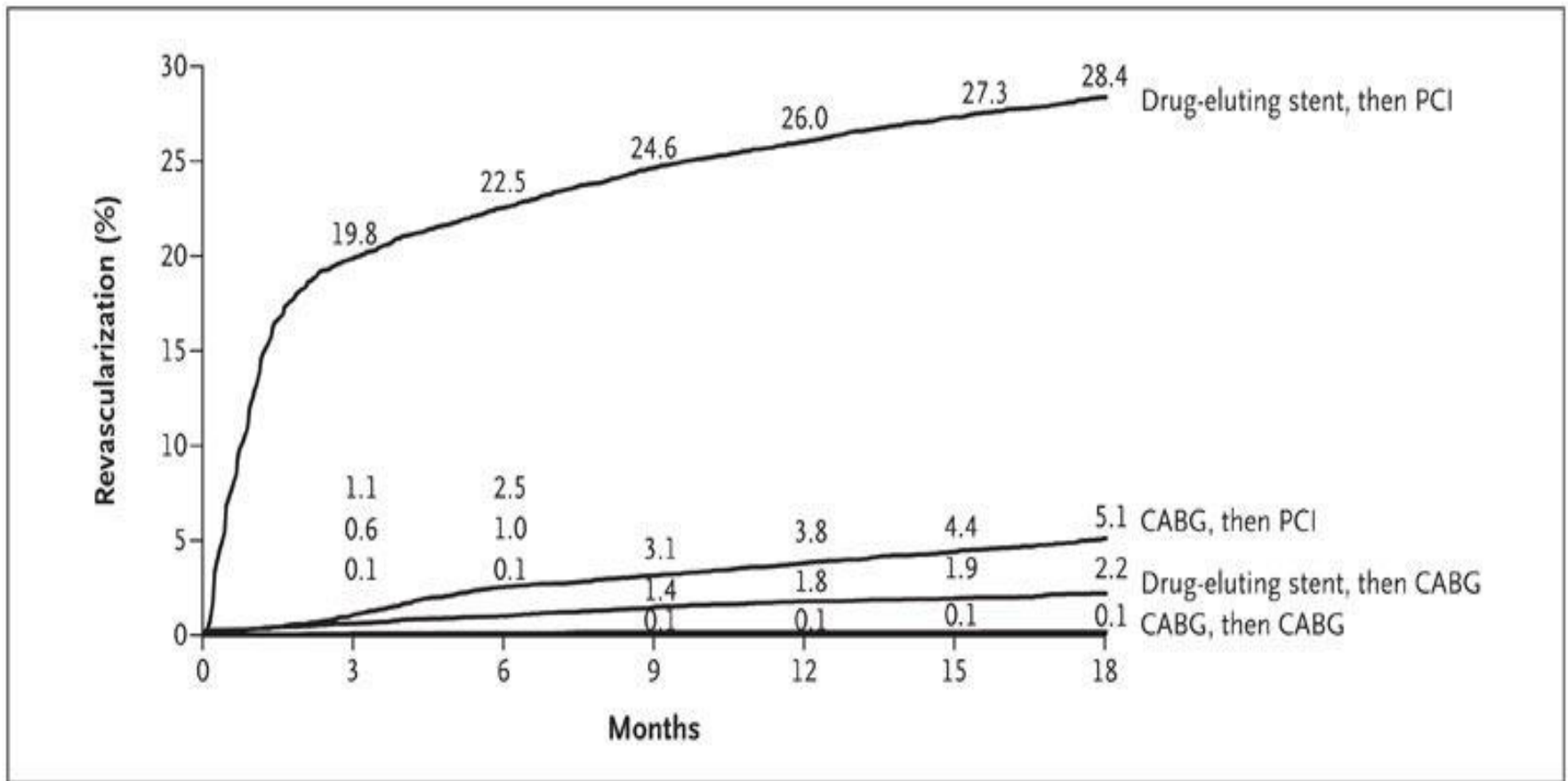


Figure 6. Incidence of adverse cardiovascular events and repeat revascularization procedures during one-year follow-up in 1,533 patients enrolled in four randomized trials comparing stenting with coronary artery bypass grafting. MI = myocardial infarction. Reprinted from Mercado et al. (26), with permission from American Association for Thoracic Surgery.



Drug-Eluting Stents vs. CABG in Multivessel Coronary Disease  
**Rates of Revascularization within 18 months after initial procedure (NY State Registry)**

Hannan EL: N Engl J Med 2008; 358:331-41

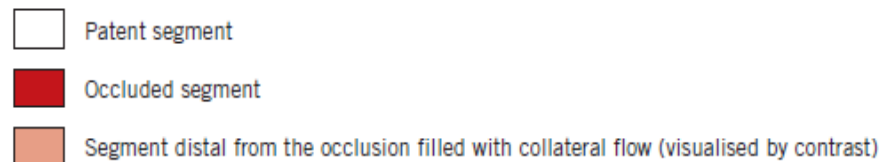
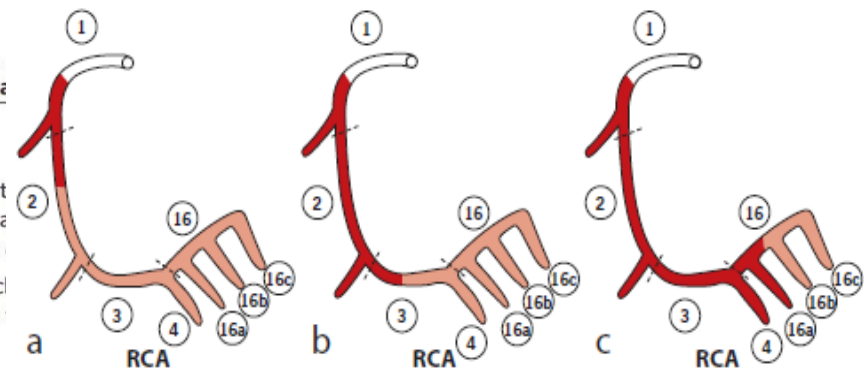
**Table 1. Segment weighing factors**

Segment No	Right dominance	Left dominance
1 RCA proximal	1	0
2 RCA mid	1	0
3 RCA distal	1	0
4 Posterior descending artery	1	n.a.
16 Posterolateral branch from RCA	0.5	n.a.
16a Posterolateral branch from RCA	0.5	n.a.
16b Posterolateral branch from RCA	0.5	n.a.
16c Posterolateral branch from RCA	0.5	n.a.
5 Left Main	5	6
6 LAD proximal	3.5	3.5
7 LAD mid	2.5	2.5
8 LAD apical	1	1
9 First diagonal	1	1
9a First diagonal <sup>a</sup>	1	1
10 Second diagonal	0.5	0.5
10a Second diagonal <sup>a</sup>	0.5	0.5
11 Proximal circumflex artery	1.5	2.5
12 Intermediate/ anterolateral artery	1	1
12a Obtuse marginal <sup>a</sup>	1	1
12b Obtuse marginal <sup>b</sup>	1	1
13 Distal circumflex artery	0.5	1.5
14 Left posterolateral	0.5	1
14a Left posterolateral <sup>a</sup>	0.5	1
14b Left posterolateral <sup>b</sup>	0.5	1
15 Posterior descending	n.a.	1

**Table 2. Lesions adverse characteristic scoring**

<b>Diameter reduction*</b>	
- Total occlusion	x5
- Significant lesion (50-99%)	x2
<b>Total occlusion (T0)</b>	
- Age >3months or unknown	+1
- Blunt stump	+1
- Bridging	+1
- First segment visible beyond T0	+1/ per non-visible segment
- Side branch (SB) - Yes, SB <1.5mm**	+1
- Yes, both SB < & ≥ 1.5mm	+1
<b>Trifurcations</b>	
- 1 diseased segment	+3
- 2 diseased segments	+4
- 3 diseased segments	+5
- 4 diseased segments	+6
<b>Bifurcations</b>	
- Type A, B, C	+1
- Type D, E, F, G	+2
- Angulation <70°	+1
<b>Aorto ostial stenosis</b>	+1
<b>Severe tortuosity</b>	+2
<b>Length &gt; 20mm</b>	+1
<b>Heavy calcification</b>	
<b>Thrombus</b>	
<b>"Diffuse disease"/sm:</b>	
x: multiplication	
+: addition	

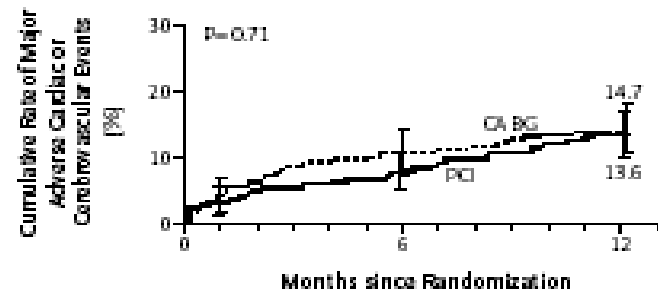
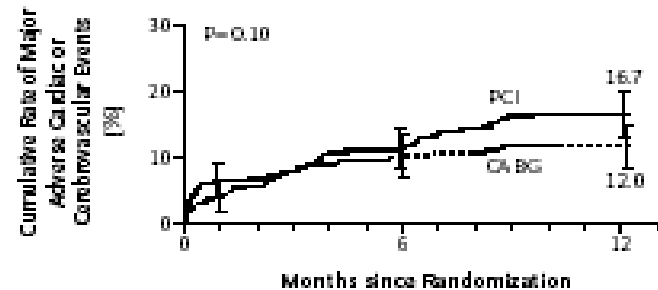
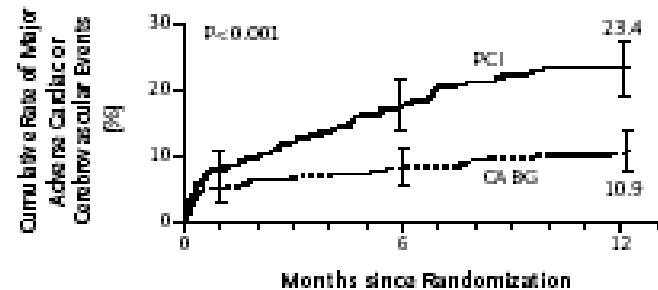
\* In the SYNTAX algorithm reduction. The lesions a diameter reduction) or  
 \*\* If all the side branch added since the lesion scored as such.



The SYNTAX Score

EuroInterv.2005;1:219-227



**A Low SYNTAX Score****B Intermediate SYNTAX Score****C High SYNTAX Score**

**Figure 3.** Rates of Major Adverse Cardiac or Cerebrovascular Events among the Study Patients, According to Treatment Group and SYNTAX Score Category.

Kaplan–Meier curves are shown for the percutaneous coronary intervention (PCI) group and the coronary-artery bypass grafting (CABG) group for major adverse cardiac or cerebrovascular events at 12 months. The 12-month event rates were similar between the two treatment groups for patients with low SYNTAX scores (0 to 22) (Panel A) or intermediate SYNTAX scores (23 to 32) (Panel B). Among patients with high SYNTAX scores (≥33, indicating the most complex disease), those in the PCI group had a significantly higher event rate at 12 months than those in the CABG group. SYNTAX scores were calculated at the core laboratory. The 1 bars indicate 1.5 SE. P values were calculated with the use of the chi-square test.

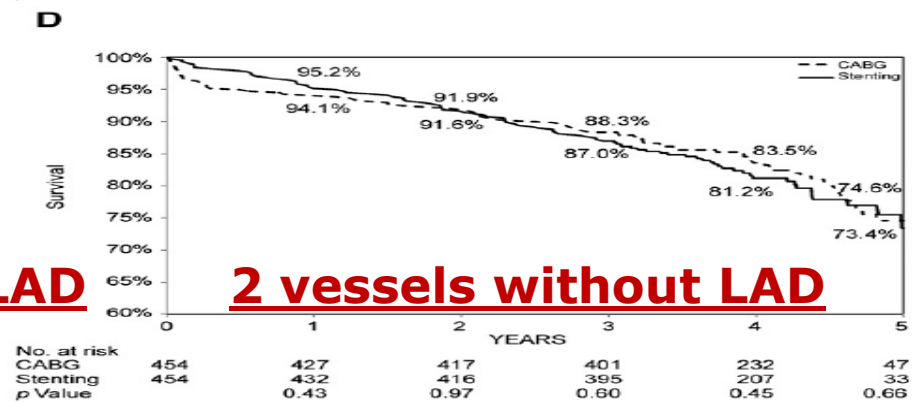
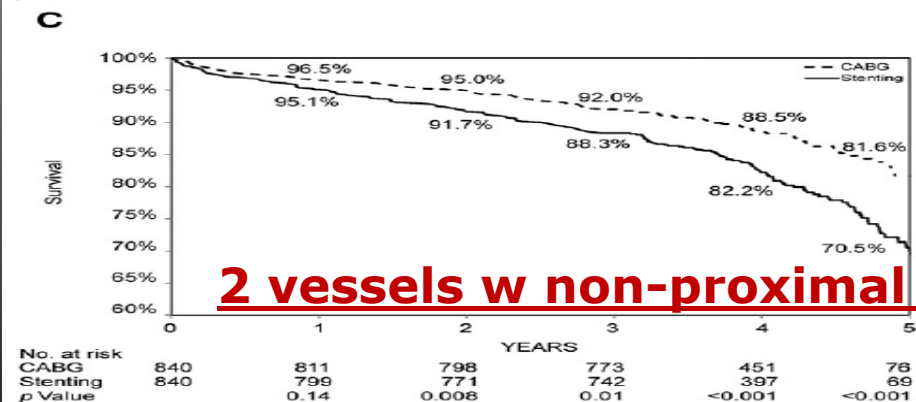
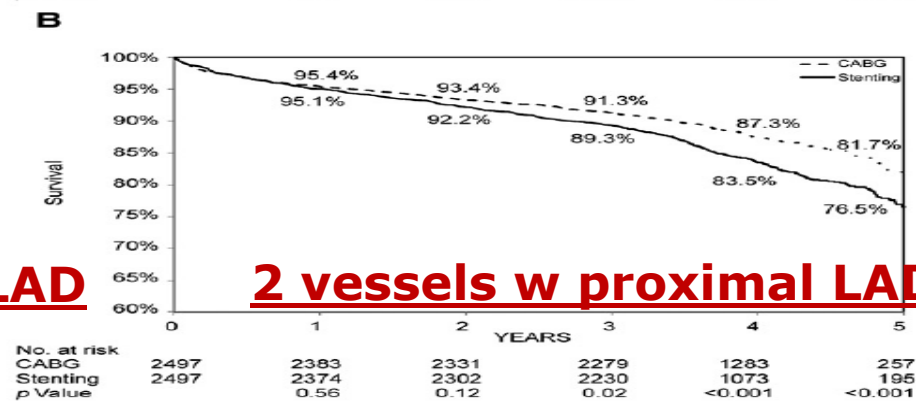
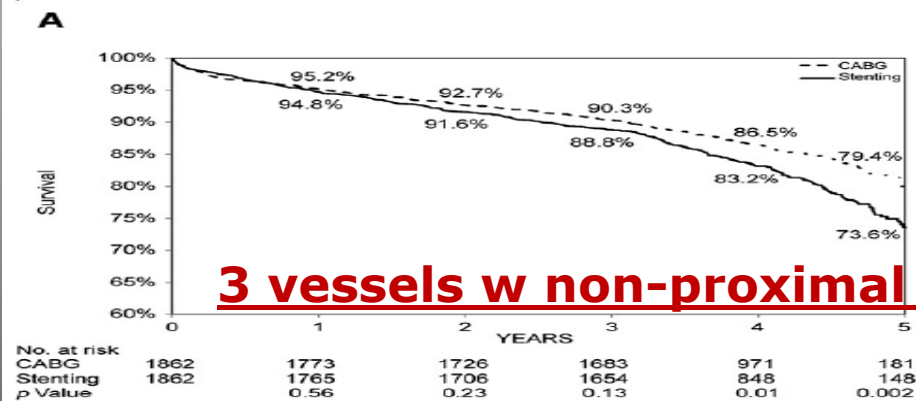
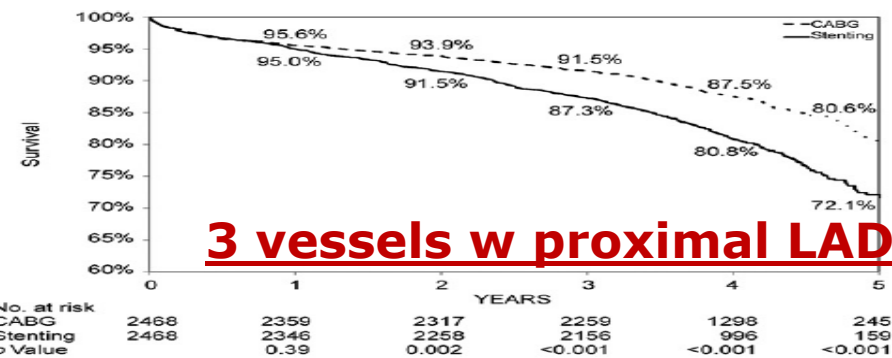
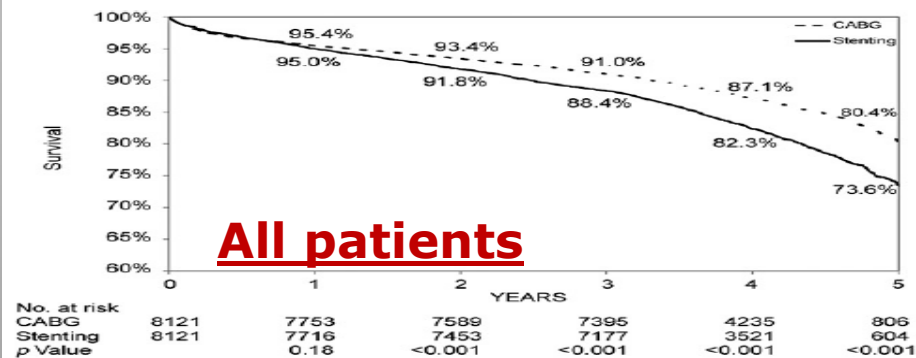
**NY Registry 5 years - propensity-mat**

Fig 2. (A)–(F). Kaplan-Meier survival curves for propensity-matched coronary artery bypass grafting (CABG) and stenting patients. (A) All patients; (B) 3 diseased vessels with diseased proximal left anterior descending (LAD) artery; (C) 3 diseased vessels with diseased nonproximal LAD artery; (D) 2 diseased vessels with diseased proximal LAD artery; (E) 2 diseased vessels with diseased nonproximal LAD artery; and (F) 2 diseased vessels without diseased LAD artery. (--- = CABG; — = stenting.)

**M  
A  
C  
C  
E**

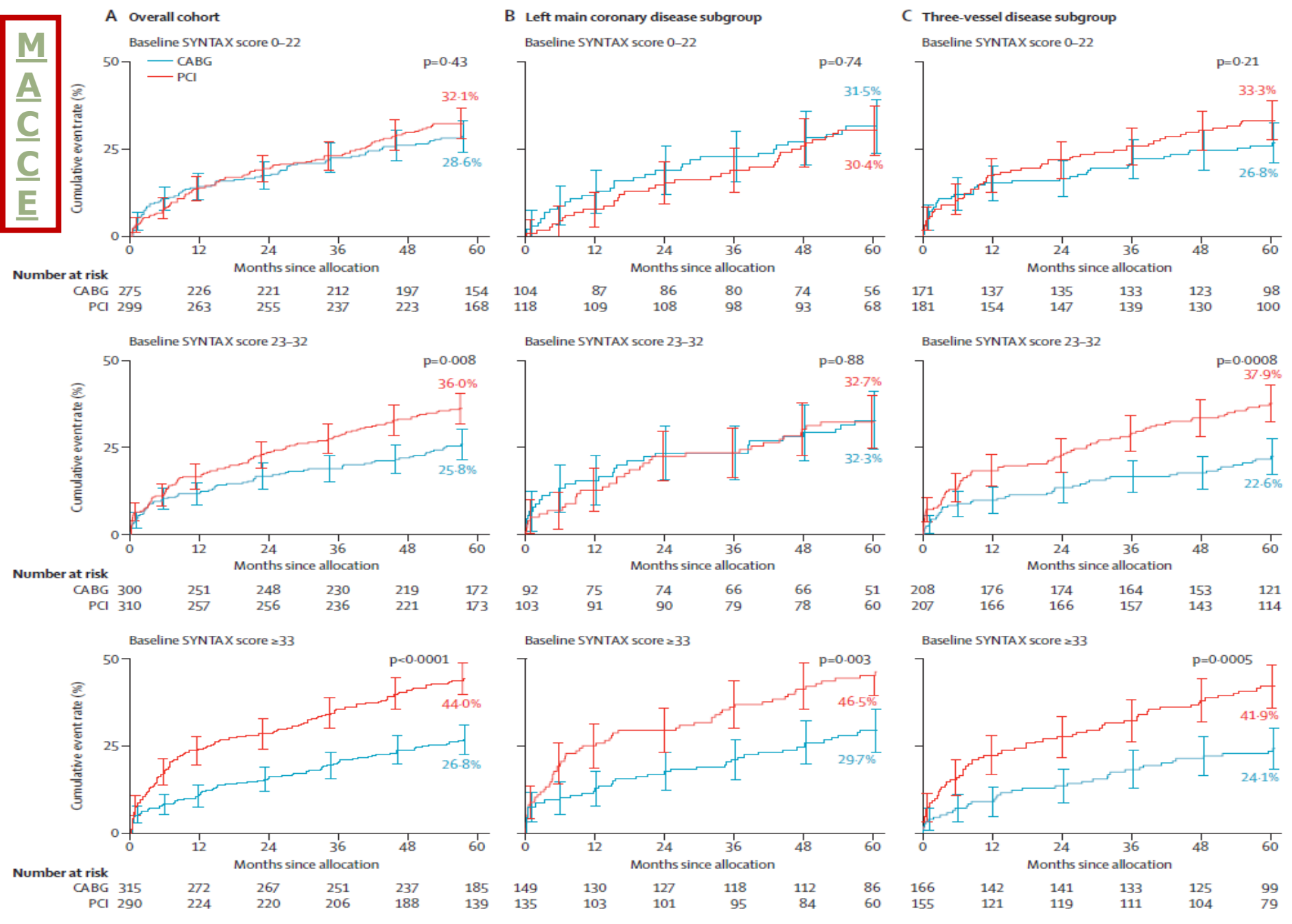
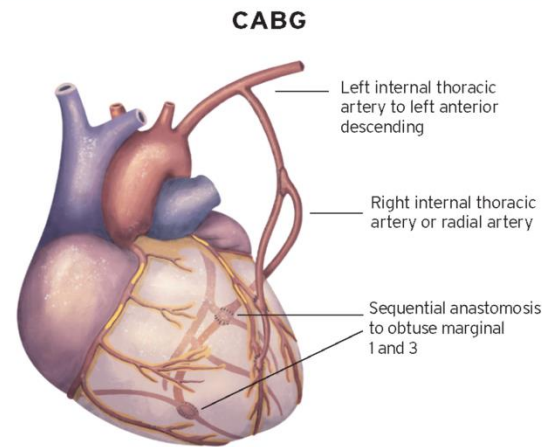
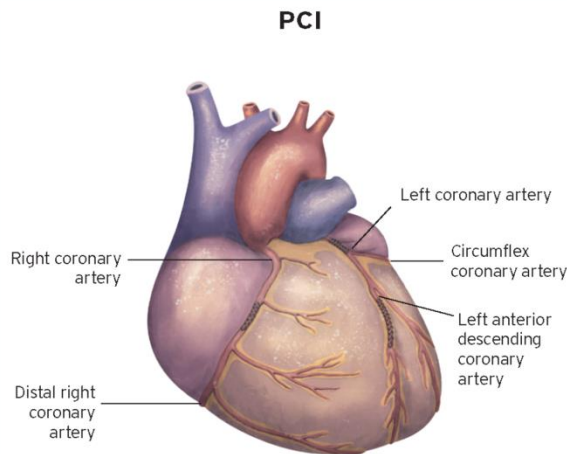


Figure 3: Kaplan-Meier cumulative event curves for MACCE by baseline SYNTAX score tercile (A) overall cohort; (B) left main coronary disease subgroup; and (C) three-vessel disease subgroup.

**Syntax 5 years**

Lancet 2013; 381: 629-38



### FAVOURS PCI

#### Clinical characteristics

Presence of severe co-morbidity (not adequately reflected by scores)  
 Advanced age/frailty/reduced life expectancy  
 Restricted mobility and conditions that affect the rehabilitation process

#### Anatomical and technical aspects

MVD with SYNTAX score 0-22  
 Anatomy likely resulting in incomplete revascularization with CABG due to poor quality or missing conduits  
 Severe chest deformation or scoliosis  
 Sequelae of chest radiation  
 Porcelain aorta\*

### FAVOURS CABG

#### Clinical characteristics

Diabetes  
 Reduced LV function (EF  $\leq$ 35%)  
 Contraindication to DAPT  
 Recurrent diffuse in-stent restenosis

#### Anatomical and technical aspects

MVD with SYNTAX score  $\geq$ 23  
 Anatomy likely resulting in incomplete revascularization with PCI  
 Severely calcified coronary artery lesions limiting lesion expansion

#### Need for concomitant interventions

Ascending aortic pathology with indication for surgery  
 Concomitant cardiac surgery

CABG = coronary artery bypass grafting; Cx = circumflex; DAPT = dual antiplatelet therapy; EF = ejection fraction; LAD = left anterior descending coronary artery; LIMA = left internal mammary artery; LV= left ventricular; MVD = multivessel coronary artery disease; PCI = percutaneous coronary intervention; PDA = posterior descending artery; RA = radial artery; RIMA = right internal mammary artery; SYNTAX = Synergy between Percutaneous Coronary Intervention with TAXUS and Cardiac Surgery.

\*Consider no-touch off-pump CABG in case of porcelain aorta.

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## Recommendation for the type of revascularization in patients with stable coronary artery disease with suitable coronary anatomy for both procedures and low predicted surgical mortality<sup>d</sup>

Recommendations according to extent of CAD	CABG		PCI	
	Class <sup>a</sup>	Level <sup>b</sup>	Class <sup>a</sup>	Level <sup>b</sup>
<b>One-vessel CAD</b>				
Without proximal LAD stenosis.	IIb	C	I	C
With proximal LAD stenosis. <sup>68,101,139–144</sup>	I	A	I	A
<b>Two-vessel CAD</b>				
Without proximal LAD stenosis.	IIb	C	I	C
With proximal LAD stenosis. <sup>68,70,73</sup>	I	B	I	C
<b>Left main CAD</b>				
Left main disease with low SYNTAX score (0–22). <sup>69,121,122,124,145–148</sup>	I	A	I	A
Left main disease with intermediate SYNTAX score (23–32). <sup>69,121,122,124,145–148</sup>	I	A	IIa	A
Left main disease with high SYNTAX score (≥33). <sup>c 69,121,122,124,146–148</sup>	I	A	III	B
<b>Three-vessel CAD without diabetes mellitus</b>				
Three-vessel disease with low SYNTAX score (0–22). <sup>102,105,121,123,124,135,149</sup>	I	A	I	A
Three-vessel disease with intermediate or high SYNTAX score (>22). <sup>c 102,105,121,123,124,135,149</sup>	I	A	III	A
<b>Three-vessel CAD with diabetes mellitus</b>				
Three-vessel disease with low SYNTAX score 0–22. <sup>102,105,121,123,124,135,150–157</sup>	I	A	IIb	A
Three-vessel disease with intermediate or high SYNTAX score (>22). <sup>c 102,105,121,123,124,135,150–157</sup>	I	A	III	A

SYNTAX score calculation information is available at <http://www.syntaxscore.com>.



**Recommendation for the type of revascularization (CABG or PCI) in patients with SCAD with suitable coronary anatomy for both procedures and low predicted surgical mortality**

Recommendations according to extent of CAD	CABG		PCI		Ref <sup>c</sup>
	Class <sup>a</sup>	Level <sup>b</sup>	Class <sup>a</sup>	Level <sup>b</sup>	
One or two-vessel disease without proximal LAD stenosis.	IIb	C	I	C	
One-vessel disease with proximal LAD stenosis.	I	A	I	A	107,108,160, 161,178,179
Two-vessel disease with proximal LAD stenosis.	I	B	I	C	108,135,137
Left main disease with a SYNTAX score ≤ 22.	I	B	I	B	17,134,170
Left main disease with a SYNTAX score 23–32.	I	B	IIa	B	17
Left main disease with a SYNTAX score >32.	I	B	III	B	17
Three-vessel disease with a SYNTAX score ≤ 22.	I	A	I	B	17,157,175,176
Three-vessel disease with a SYNTAX score 23–32.	I	A	III	B	17,157,175,176
Three-vessel disease with a SYNTAX score >32.	I	A	III	B	17,157,175,176

CABG = coronary artery bypass grafting; LAD = left anterior descending coronary artery; PCI = percutaneous coronary intervention; SCAD = stable coronary artery disease.

<sup>a</sup>Class of recommendation.

<sup>b</sup>Level of evidence.

<sup>c</sup>References.

# Maximização do Benefício p.o.

- ▣ **Aspirina**
- ▣ **Dislipidemia - estatinas**
- ▣ **Recuperação rápida (“fast track”)**
- ▣ **Tabagismo**
- ▣ **Reabilitação**
- ▣ **Disfunção emocional e psicossocial**
- ▣ **Apoio da equipe de saúde**

**Table 13.** Proven Management Strategies to Reduce Perioperative and Late Morbidity and Mortality

<b>Timing</b>	<b>Class</b>	<b>Indication</b>	<b>Intervention</b>	<b>Comments</b>
<b>Preoperative</b>				
Carotid screening	I		Carotid duplex ultrasound in defined population	Carotid endarterectomy if stenosis greater than or equal to 80%
<b>Perioperative</b>				
Antimicrobials	I		Prophylactic antimicrobials	See Table 14
Antiarrhythmics	I		Beta-blockers to prevent postoperative atrial fibrillation	Propafenone or amiodarone are alternatives if contraindication to beta-blocker (see Table 15)
<b>Postoperative</b>				
Antiplatelet agents	I		Aspirin to prevent early vein-graft attrition	Ticlopidine or clopidogrel are alternatives if contraindications to aspirin
Lipid-lowering therapy	I		Cholesterol-lowering agent plus low-fat diet if low-density lipoprotein cholesterol greater than 100 mg/dL	3-Hydroxy-3-methylglutaryl/coenzyme A reductase inhibitors preferred if elevated low-density lipoprotein is major aberration
Smoking cessation	I		Smoking cessation education, and offer counseling and pharmacotherapies	



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**ESC/EACTS GUIDELINES**



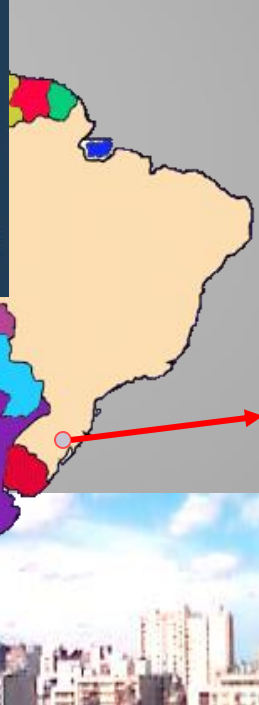
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**The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)**

**Developed with the special contribution of the European Association of Percutaneous Cardiovascular Interventions (EAPCI)**

## Referências:

1. Patel M et al. ACCF/SCAI/STS/AATS/AHA/ASNC 2009 Appropriateness Criteria for Coronary Revascularization. *J. Am. Coll. Cardiol.* 2009;53:530-553
2. ACC/AHA 2004 guideline update for coronary artery bypass graft surgery *Circulation* 2004 Oct 5;110(14):e340-437.  
*Erratum in: Circulation* 2005 Apr 19;111(15):2014.
3. Jones RH. *The year in cardiovascular surgery.* *JACC* 2006; 47:2094-107
4. Diretrizes da SBC. <http://publicacoes.cardiol.br>
5. ESC/EACTS Guidelines Myocardial Revascularization: *European Heart Journal* (2010) 31, 2501-2555
6. Serruys et al (SYNTAX trial) Percutaneous Coronary Intervention versus Coronary-Artery Bypass Grafting for Severe Coronary Artery Disease. *N Engl J Med* 2009;360:961-72.



# FUNDAÇÃO UNIVERSITÁRIA DE CARDIOLOGIA INSTITUTO DE CARDIOLOGIA DO RS



Av. Princesa Isabel, 395 – Porto Alegre - RS – Brasil  
Telefone: (51) 3230 3600

[www.cardiologia.org.br](http://www.cardiologia.org.br)

