



ČESKÁ ASOCIACE INTERVENČNÍ KARDIOLOGIE

Souhrn guidelines pro revaskularizaci myokardu: Stabilní ICHS

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ESC/EACTS GUIDELINES



2014 ESC/EACTS Guidelines on myocardial revascularization

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)

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Vybrané části



- Skórovací systémy
- Stabilní ICHS
- PCI a protidestičková + antikoagulační léčba
- PCI vs CABG
- CABG



Skórovací systémy pro odhad rizika PCI a CABG



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

^aReferences.

^bWhichever occurs last.

^cPermanent stroke, renal failure, prolonged ventilation, deep sternal wound infection, re-operation, length of stay < 6 or > 14 days.

^dIf creatinine is > 2 mg/dL.



Skórovací systémy pro odhad rizika PCI a CABG



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Risk models to assess medium- to long-term (≥ 1 year) outcomes

Score	Development cohort	Patient inclusion	Coronary procedures	Number of variables		Outcome	Recommendation		Validation studies	Calculation	Ref ^a
				Clinical	Anatomical		CABG	PCI			
SYNTAX	none, expert opinion	none	-	0	11 (3 general, 8 per lesion)	MACCE	I B	I B	>50	www.syntaxscore.com	30
SYNTAX II	1 800 Multicentre	03/2005 – 04/2007	50% CABG, 50% PCI	6	12	4-year mortality	IIa B	IIa B	<5	-	25
ASCERT CABG	174 506 Multicentre	01/2002 – 12/2007	100% (i)CABG	23	2	Mortality >2 years	IIa B		<5	-	27
ASCERT PCI	206 081 Multicentre	2004 – 2007	100% PCI	17	2	Mortality >1 year		IIa B	<5	-	28
Logistic Clinical SYNTAX	6 508 Multicentre	03/2005 – 04-2007	100% PCI	3	11	1-year MACE and mortality		IIa B	<5	-	24

ASCERT = American College of Cardiology Foundation–Society of Thoracic Surgeons Database Collaboration (ACCF–STS) on the comparative effectiveness of revascularization strategies; (i) CABG = (isolated) coronary artery bypass grafting; MACCE = major adverse cardiac and cerebrovascular events; PCI = percutaneous coronary intervention; SYNTAX = synergy between percutaneous coronary intervention with TAXUS and cardiac surgery.

^aReferences.



Indikace revaskularizace u stabilní ICHS



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Indications for revascularization in patients with stable angina or silent ischaemia

Extent of CAD (anatomical and/or functional)		Class ^b	Level ^c	References
<i>For prognosis</i>	Left main disease with stenosis >50% ^a	I	A	108,134,135
	Any proximal LAD stenosis >50% ^a	I	A	94,108,135,136
	Two-vessel or three-vessel disease with stenosis > 50% ^a with impaired LV function (LVEF<40%) ^a	I	A	93,94,108,112,121,135,137–142
	Large area of ischaemia (>10% LV)	I	B	54,91,97,99,143,144
	Single remaining patent coronary artery with stenosis >50% ^a	I	C	
<i>For symptoms</i>	Any coronary stenosis >50% ^a in the presence of limiting angina or angina equivalent, unresponsive to medical therapy	I	A	54,96,105,108,118–120,145

^aWith documented ischaemia or FFR \leq 0.80 for diameter stenosis <90%.

^bClass of recommendation.

^cLevel of evidence.

CAD = coronary artery disease; FFR = fractional flow reserve; LAD = left anterior descending coronary artery; LV = left ventricular.



Volba optimální formy revaskularizace u stabilní ICCHS



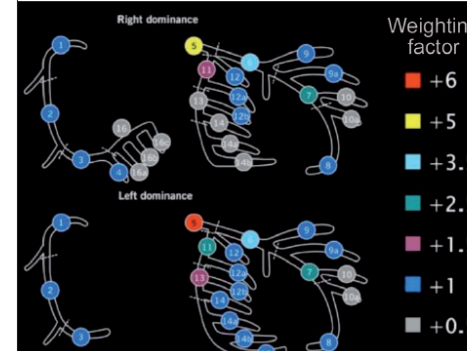
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Recommendation for the type of revascularization (CABG or PCI) in patients with SCAD v for both procedures and low predicted surgical mortality

Recommendations according to extent of CAD	CABG		PCI	
	Class ^a	Level ^b	Class ^a	Level ^b
One or two-vessel disease without proximal LAD stenosis.	IIb	C	I	C
One-vessel disease with proximal LAD stenosis.	I	A	I	A
Two-vessel disease with proximal LAD stenosis.	I	B	I	C
Left main disease with a SYNTAX score ≤ 22.	I	B	I	B
Left main disease with a SYNTAX score 23–32.	I	B	IIa	B
Left main disease with a SYNTAX score >32.	I	B	III	B
Three-vessel disease with a SYNTAX score ≤ 22.	I	A	I	B
Three-vessel disease with a SYNTAX score 23–32.	I	A	III	B
Three-vessel disease with a SYNTAX score >32.	I	A	III	B

CABG = coronary artery bypass grafting; LAD = left anterior descending coronary artery; PCI = percutaneous coronary intervention
^aClass of recommendation.
^bLevel of evidence.
^cReferences.

Table 3 Guide to calculate the SYNTAX score

Steps	Variable assessed	Description
Step 1	Dominance	The weight of individual coronary segments varies according to coronary artery dominance (right or left). Co-dominance does not exist as an option in the SYNTAX score.
Step 2	Coronary segment	The diseased coronary segment directly affects the score as each coronary segment is assigned a weight, depending on its location, ranging from 0.5 (i.e. posterolateral branch) to 6 (i.e. left main in case of left dominance). 
Step 3	Diameter stenosis	The score of each diseased coronary segment is multiplied by 2 in case of a stenosis 50–99% and by 5 in case of total occlusion. In case of total occlusion, additional points will be added as follows: - Age >3 months or unknown +1 - Blunt stump +1 - Bridging +1 - First segment visible distally +1 per non visible segment - Side branch at the occlusion +1 if <1.5mm diameter +0 if ≥1.5mm diameter (i.e. bifurcation lesion)
Step 4	Trifurcation lesion	The presence of a trifurcation lesion adds additional points based on the number of diseased segments: - 1 segment +3 - 2 segments +4 - 3 segments +5 - 4 segments +6
Step 5	Bifurcation lesion	The presence of a bifurcation lesion adds additional points based on the type of bifurcation according to the Medina classification: ²⁶ - Medina 1,0,0 or 0,1,0 or 1,1,0: add 1 additional point - Medina 1,1,1 or 0,0,1 or 1,0,1 or 0,1,1: add 2 additional point Additionally, the presence of a bifurcation angle <70° adds 1 additional point.
Step 6	Aorto-ostial lesion	The presence of aorto-ostial lesion segments adds 1 additional point
Step 7	Severe tortuosity	The presence of severe tortuosity proximal of the diseased segment adds 2 additional points
Step 8	Lesion length	Lesion length >20 mm adds 1 additional point
Step 9	Calcification	The presence of heavy calcification adds 2 additional points
Step 10	Thrombus	The presence of thrombus adds 1 additional point
Step 11	Diffuse disease/small vessels	The presence of diffusely diseased and narrowed segments distal to the lesion (i.e. when at least 75% of the length of the segment distal to the lesion has a vessel diameter of <2mm) adds 1 point per segment number



Protidestičková léčba u stabilní ICCHS



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Recommendations for antithrombotic treatment in SCAD patients undergoing PCI

Recommendations for PCI	Class ^a	Level ^b	Ref ^c
Pretreatment with antiplatelet therapy			
Treatment with 600 mg clopidogrel is recommended in elective PCI patients once anatomy is known and decision to proceed with PCI preferably 2 hours or more before the procedure.	I	A	789–792
Pretreatment with clopidogrel may be considered in patients with high probability for significant CAD.	IIb	C	
In patients on a maintenance dose of 75 mg clopidogrel, a new loading dose of 600 mg or more may be considered once the indication for PCI is confirmed.	IIb	C	
Antiplatelet therapy during PCI			
ASA is indicated before elective stenting.	I	B	776,793,794
ASA oral loading dose of 150–300 mg (or 80–150 mg i.v.) is recommended if not pre-treated.	I	C	
Clopidogrel (600 mg loading dose or more, 75 mg daily maintenance dose) is recommended for elective stenting.	I	A	795–798
GP IIb/IIIa antagonists should be considered only for bail-out.	IIa	C	
Antiplatelet therapy after stenting			
DAPT is indicated for at least 1 month after BMS implantation.	I	A	791,799–801
DAPT is indicated for 6 months after DES implantation.	I	B	799,802,803
Shorter DAPT duration (<6 months) may be considered after DES implantation in patients at high bleeding risk.	IIb	A	804,805
Life-long single antiplatelet therapy, usually ASA, is recommended.	I	A	776,794
Instruction of patients about the importance of complying with antiplatelet therapy is recommended.	I	C	-
DAPT may be used for more than 6 months in patients at high ischaemic risk and low bleeding risk.	IIb	C	-
Anticoagulant therapy			
Unfractionated heparin 70–100 U/kg.	I	B	806
Bivalirudin (0.75 mg/kg bolus, followed by 1.75 mg/kg/hour for up to 4 hours after the procedure) in case of heparin-induced thrombocytopenia.	I	C	-
Bivalirudin (0.75 mg/kg bolus, followed by 1.75 mg/kg/hour during the procedure) in patients at high bleeding risk.	IIa	A	783–785
Enoxaparin i.v. 0.5 mg/kg.	IIa	B	786,788,807

^aClass of recommendation.

^bLevel of evidence.

^cReferences.

ASA = acetylsalicylic acid; BMS = bare-metal stent; CAD = coronary artery disease; DAPT = dual antiplatelet therapy; DES = drug-eluting stent; GP = glycoprotein; i.v. = intravenous; PAD = peripheral artery disease; PCI = percutaneous coronary intervention; SCAD = stable coronary artery disease.



PCI a antikoagulační léčba

Recommendations for antithrombotic treatment in patients undergoing PCI who require oral anticoagulation

Recommendations	Class ^a	Level ^b	Ref ^c
In patients with a firm indication for oral anticoagulation (e.g. atrial fibrillation with CHA ₂ DS ₂ -VASc score ≥ 2 , venous thromboembolism, LV thrombus, or mechanical valve prosthesis), oral anticoagulation is recommended in addition to antiplatelet therapy.	I	C	
New-generation DES are preferred over BMS among patients requiring oral anticoagulation if bleeding risk is low (HAS-BLED ≤ 2).	IIa	C	
In patients with SCAD and atrial fibrillation with CHA ₂ DS ₂ -VASc score ≥ 2 at low bleeding risk (HAS-BLED ≤ 2), initial triple therapy of (N)OAC and ASA (75–100 mg/day) and clopidogrel 75 mg/day should be considered for a duration of at least one month after BMS or new-generation DES followed by dual therapy with (N)OAC and aspirin 75–100 mg/day or clopidogrel (75 mg/day) continued up to 12 months.	IIa	C	
DAPT should be considered as alternative to initial triple therapy for patients with SCAD and atrial fibrillation with CHA ₂ DS ₂ -VASc score ≤ 1 .	IIa	C	
In patients with ACS and atrial fibrillation at low bleeding risk (HAS-BLED ≤ 2), initial triple therapy of (N)OAC and ASA (75–100 mg/day) and clopidogrel 75 mg/day should be considered for a duration of 6 months irrespective of stent type followed by (N)OAC and aspirin 75–100 mg/day or clopidogrel (75 mg/day) continued up to 12 months.	IIa	C	
In patients requiring oral anticoagulation at high bleeding risk (HAS-BLED ≥ 3), triple therapy of (N)OAC and ASA (75–100 mg/day) and clopidogrel 75 mg/day should be considered for a duration of one month followed by (N)OAC and aspirin 75–100 mg/day or clopidogrel (75 mg/day) irrespective of clinical setting (SCAD or ACS) and stent type (BMS or new-generation DES).	IIa	C	
Dual therapy of (N)OAC and clopidogrel 75 mg/day may be considered as an alternative to initial triple therapy in selected patients.	IIb	B	865,870
The use of ticagrelor and prasugrel as part of initial triple therapy is not recommended	III	C	
Anticoagulation therapy after PCI in ACS patient			
In selected patients who receive ASA and clopidogrel, low-dose rivaroxaban (2.5 mg twice daily) may be considered in the setting of PCI for ACS if the patient is at low bleeding risk.	IIb	B	855
Anticoagulation during PCI in patients on oral anticoagulation			
It is recommended to use additional parenteral anticoagulation, regardless of the timing of the last dose of (N)OAC.	I	C	
Periprocedural parenteral anticoagulants (bivalirudin, enoxaparin or UFH) should be discontinued immediately after primary PCI.	IIa	C	

^aClass of recommendation.

^bLevel of evidence.

^cReferences.

ACS = acute coronary syndrome; ASA = acetylsalicylic acid; BMS = bare-metal stent; CHA₂DS₂-VASc = Cardiac failure, Hypertension, Age ≥ 75 [Doubled], Diabetes, Stroke [Doubled]–Vascular disease, Age 65–74 and Sex category [Female]; DAPT = dual antiplatelet therapy; DES = drug-eluting stent; (N)OAC = (non-vitamin K antagonist) oral anticoagulant; HAS-BLED = hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile INR, elderly, drugs/alcohol; INR = international normalized ratio; LV = left ventricular; PCI = percutaneous coronary intervention; SCAD = stable coronary artery disease; UFH = unfractionated heparin.



PCI a antikoagulační léčba

Riziko ischemie vs krvácení

CHA₂DS₂-VASc Score for Atrial Fibrillation Stroke Risk

Calculates stroke risk for patients with atrial fibrillation, possibly better than the CHADS₂ score.

Age in Years	<input type="radio"/> <65 0 <input checked="" type="radio"/> 65-74 +1 <input type="radio"/> ≥75 +2	<p>3 points</p> <p>Stroke risk was 5.9% per year according to the 2012 ESC Guideline updates.</p> <p>One recommendation suggests a 0 score is "low" risk and may not require anticoagulation; a 1 score is "low-moderate" risk and should consider antiplatelet or anticoagulation, and score 2 or greater is "moderate-high" risk and should otherwise be an anticoagulation candidate.</p>
Sex	<input type="radio"/> Male 0 <input checked="" type="radio"/> Female +1	
Congestive Heart Failure History	+1 <input type="checkbox"/> NO <input type="checkbox"/>	
Hypertension History	+1 YES <input checked="" type="checkbox"/> <input type="checkbox"/>	
Stroke/TIA/Thromboembolism History	+2 <input type="checkbox"/> NO <input type="checkbox"/>	
Vascular Disease History	+1 <input type="checkbox"/> NO <input type="checkbox"/>	
Diabetes Mellitus	+1 <input type="checkbox"/> NO <input type="checkbox"/>	

HAS-BLED Score for Major Bleeding Risk

Estimates risk of major bleeding for patients on anticoagulation for atrial fibrillation.

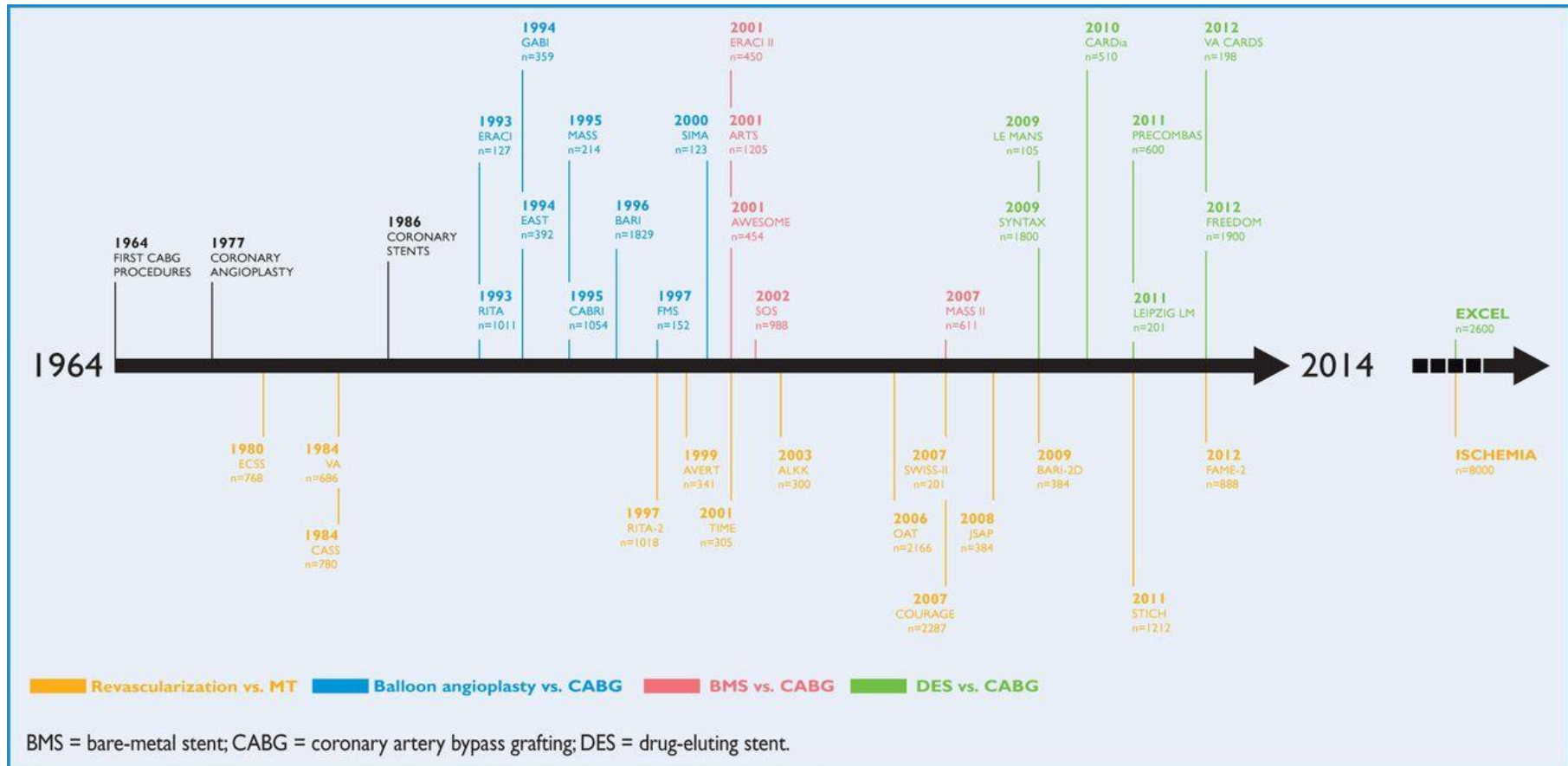
Hypertension History	+1 YES <input checked="" type="checkbox"/> <input type="checkbox"/>	<p>3</p> <p>Risk was 5.8% in one validation study and 3.72 bleeds per 100 patient-years in another validation study.</p> <p>Alternatives to anticoagulation should be considered: Patient is at high risk for major bleeding.</p>
Renal Disease	+1 <input type="checkbox"/> NO <input type="checkbox"/>	
Liver Disease	+1 <input type="checkbox"/> NO <input type="checkbox"/>	
Stroke History	+1 YES <input checked="" type="checkbox"/> <input type="checkbox"/>	
Prior Major Bleeding or Predisposition to Bleeding	+1 <input type="checkbox"/> NO <input type="checkbox"/>	
Labile INR	+1 <input type="checkbox"/> NO <input type="checkbox"/>	
Age > 65	+1 YES <input checked="" type="checkbox"/> <input type="checkbox"/>	
Medication Usage Predisposing to Bleeding	+1 <input type="checkbox"/> NO <input type="checkbox"/>	
Alcohol or Drug Usage History	+1 <input type="checkbox"/> NO <input type="checkbox"/>	

PCI vs CABG - randomizované studie



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Průchodnost graftů

Table 9 Graft patency after CABG

Graft	Patency at 1 year	Patency at 4-5 years	Patency at ≥ 10 years	References
Saphenous vein graft	75–95%	65–85%	32–71%	473–477
Radial artery	92–96%	90%	63–83%	473,474,478–480
Left IMA	>95%	90–95%	88–95%	475,480
Right IMA	>95%	>90%	65–90%	475

CABG = coronary artery bypass grafting; IMA = internal mammary artery.



Závěry

- Četné rizikové skórovací systémy jsou nedílnou součástí praxe.
- Moderní technologie a postupy jako lékové stenty (DES) 2. generace a plná arteriální revaskularizace jsou preferovány u „všech“ pacientů.
- Důraz je kladen na tzv. funkční revaskularizaci, tzn. revaskularizaci lézí/tepen s průkazem ischemie myokardu.
- Trvání duální protidestičkové léčby po DES 2. generace u pacientů se stabilní ICHS může být zkráceno na 6 a méně měsíců.
- Velký důraz je kladen na individualizovanou antitrombotickou léčbu.

