

Clinical trials of angioplasty

TrialResults-center www.trialresultscenter.org

1 acute myocardial infarction

Trial	Treatments	Patients	Trials design and methods
primary angioplasty vs immediate thrombolysis			
MAASTRICHT (Vermeer) , 1999 n=75/75 follow-up:	Transfer for primary PTCA versus immediate thrombolysis with tPA	patients with acute myocardial infarction initially admitted to a hospital without PTCA facilities	open
PRAGUE-1 , 2000 n=101/99 follow-up: 30 days	immediate transportation for primary angioplasty without pre-treatment with thrombolysis versus immediate thrombolysis with streptokinase	patients with acute myocardial infarction, presenting within 6 h of symptom onset at community hospitals without a catheterization laboratory	open
AIR-PAMI , 2002 n=71/66 follow-up:	Transfer for Primary Angioplasty versus immediate thrombolysis (various thrombolytic)	Patients with high-risk AMI (age >70 years, anterior MI, Killip class II/III, heart rate >100 beats/min or systolic BP <100 mm Hg), eligible for thrombolytic therapy	open
CAPTIM , 2002 n=421/419 follow-up:	Transfer for Primary Angioplasty versus prehospital fibrinolysis with accelerated alteplase	patients within 6 h of acute myocardial infarction with ST-segment elevation, initially managed by mobile emergency-care units	open
DANAMI-2 , 2003 n=567/562 follow-up: 30 days	Transfer for Primary Angioplasty versus immediate thrombolysis with tPA (accelared infusion)	patients with myocardial infarction with ST-segment elevation	Parallel groups open
PRAGUE-2 , 2003 n=429/421 follow-up: 30 days	immediate transport for primary percutaneous coronary intervention versus immediate thrombolysis with streptokinase	patients with acute ST elevation myocardial infarction presenting within <12 h to the nearest community hospital without a catheter laboratory	open
immediate systematic ballon angioplasty vs no immediate angioplasty			

continued...

Trial	Treatments	Patients	Trials design and methods
ECSCG , 1988 n=183/184 follow-up: 1 y	angioplasty as soon as possible (after rtPA) versus non-invasive strategy without immediate CA and PTCA	patients with acute myocardial infarction within 5 h after onset of symptoms	parallel group open Europe
Belenkie , 1991 n=50/39 follow-up: 4 months	immediate PTCA versus delayed PTCA (18-38h)	patients with a patent infarct-related artery after thrombolytic therapy suitable for angioplasty	parallel group open Canada
Ellis , 1994 n=78/73 follow-up:	balloon angioplasty supplemented by further thrombolytic therapy as needed versus conservative therapy	patients with first anterior wall infarction treated with any accepted intravenous thrombolytic regimen and angiographically demonstrated to have an occluded infarct vessel within 8 hours of chest pain onset	
Erbel , 1989 n=103/103 follow-up: 3 years	combined intravenous and intracoronary streptokinase with immediate coronary angioplasty versus combined intravenous and intracoronary streptokinase without immediate coronary angioplasty	patients with acute transmural myocardial infarction	Parallel groups
MERLIN (Sutton) , 2004 n=NA follow-up: 30 days	emergency coronary angiography with rescue PCI versus conservative treatment	patients with STEMI and failed fibrinolysis	Parallel groups
SHOCK (Hochman) , 1999 [NCT00000552] n=152/150 follow-up: 30 days (6y)	emergency revascularization versus initial medical stabilization	patients with cardiogenic shock complicating acute MI	Parallel groups open US
SWISS-SMASH , 1999 n=32/23 follow-up: 30 days (1y)	emergency angiography, followed immediately by revascularization when indicated versus initial medical management	Patients with acute myocardial infarction and early shock	Parallel groups open Europe
TAMI 1 pilot , 1987 n=99/98 follow-up: in hospital	Angioplasty within 120 min (after rtPA) versus deferred CA (7-10 days) and angioplasty if indicated	patients with acute myocardial infarction.	parallel group open USA

continued...

Trial	Treatments	Patients	Trials design and methods
TAMI-5 (Calif) , 1991 n=287/288 follow-up:	immediate catheterization with angioplasty for failed thrombolysis (90min after rtPA/urokinase) versus deferred predischage catheterization on days 5-10, no PTCA planned	patient with acute myocardial infarction	Factorial plan
TIMI 2A , 1988 n=195/194 follow-up: 21 days	CA within 120 min of the start of the rtPA infusion. PTCA whether the artery is open or closed versus CA within 18-48hrs. PTCA only if artery open (TIMI 2 or 3)	patient thrombolized for a AMI	parallel group open USA
Topol , 1987 n=15/13 follow-up: in hospital	immediate PTCA versus no PTCA	patients with evolving transmural myocardial infarction	parallel group open USA
systematic ballon angioplasty vs no systematic angioplasty			
SWIFT , 1991 n=397/403 follow-up: 1 y	CA 72h with a view to PTCA or CABG versus elective angioplasty (only if required by clinical indication)	patients presenting with clinical and electrocardiographic features of acute myocardial infarction up to three hours after the onset of major symptoms	Parallel groups Open UK
SIAM , 1992 n=158/166 follow-up: <3 years	CA with CABG/PTCA 14-48 hours versus no CA within the first 21days unless evidence of ischemia	patients treated by thrombolysis for AMI	Parallel groups Open Europe
TAMI 6 , 1992 n=34/37	PTCA 6-24h after rtPA versus no PTCA planned	-	
Barbash , 1990 n=97/104	PTCA>72h after rtPA if stenosis>70% versus PTCA>72h after rtPA if stenosis>50% and ischemia	-	
Guerci , 1987 n=42/43 follow-up: 10 days	PTCA at 4 day versus no PTCA during the 10 days study period	patients candidate to PTCA determined at the 1st day CA	Factorial plan United states

continued...

Trial	Treatments	Patients	Trials design and methods
TIMI 2 , 1989 n=1636/1626 follow-up: 6 we	CA 18 to 48 hrs versus no CA unless spontaneous or exercise induced ischemia	patients treated with intravenous recombinant tissue plasminogen activator (rt-PA) within four hours of the onset of chest pain thought to be caused by myocardial infarction	Factorial plan Open United states
TIMI II-A (deferred) n=194/197 follow-up:	delayed invasive strategy, deferred angiography and PTCA for 18-48 hours versus conservative approach	-	
TOPS , 1992 n=42/45 follow-up: 12 months	PTCA to be performed 4-14 days after MI versus conservative management, no PTCA	patients with residual stenoses after thrombolytic treatment of myocardial infarction	Parallel groups
Van den Brand , 1991 n=113/104 follow-up: 3 mo	CA at 2-5 days, PTCA if suitable lesion versus CA at 2-5 days but no PTCA	suitable lesion	Parallel groups NA Europe
Vermeer , 1999 n=NA follow-up: 42 days	alteplase followed by transfer to the PTCA centre and (if indicated) rescue PTCA versus thrombolytic treatment with alteplase	patients with acute myocardial infarction initially admitted to a hospital without PTCA facilities	Parallel groups
thrombolysis + angioplasty vs immediate thrombolysis			
NORDISTEMI , 2009 [NCT00161005] n=134/132 follow-up: 1y	transfer for immediate coronary angiography and intervention versus concernative strategy	patients with STEMI of less than 6 hours of duration and more than 90 minutes expected time delay to PCI	Parallel groups open Norway
CARESS , 2008 n=NA follow-up: 30 days	immediate transfer for PCI after half-dose reteplase, abciximab, heparin, and aspirin versus half-dose reteplase, abciximab, heparin, and aspirin, transfer for PCI only if they had persistent ST elevation at 90 minutes (rescue PCI)	STEMI patients under 75 years old within 12 hours of symptom onset who had been admitted to hospitals without PCI facilities	open France, Italy, and Poland
CAPITAL AMI , 2005 n=86/84 follow-up: 6 months	full-dose tenecteplase (TNK) plus PCI versus thrombolysis alone	high-risk MI patients within six hours of symptom onset	Parallel groups open US

continued...

Trial	Treatments	Patients	Trials design and methods
PRAGUE-1 (thrombolysis+PTCA) , 2000 n=100/99 follow-up: 30 days	thrombolytic therapy during transportation to angioplasty versus immediate thrombolysis with streptokinase	patients with acute myocardial infarction, presenting within 6 h of symptom onset at community hospitals without a catheterization laboratory	Parallel groups open Czech Republic
TRANSFER-AMI , 2008 <i>ongoing</i> [NCT00164190] n=NA follow-up: 30 days	pharmacoinvasive strategy (transfer for PCI within six hours of fibrinolysis) versus standard treatment after fibrinolysis (rescue PCI for failed reperfusion, with elective PCI encouraged for successfully reperfused patients after 24 hours)	patients with high-risk STEMI	Parallel groups open
primary ballon angioplasty vs accelerated t-PA			
Ribichini , 1996 n=24/26 follow-up: discharge	primary PTCA versus accelerated alteplase 90 min (15 mg IV bolus followed by an infusion of 0.75 mg/kg over 30min not to exceed 50mg, and then 0.5 mg/kg over the next 60min not to exceed 35mg for a total maximum of 100mg)	-	Parallel groups open Italy
Garcia , 1997 n=95/94 follow-up: 30 d	primary PTCA versus accelerated t-PA 90 min (15 mg IV bolus followed by an infusion of 0.75 mg/kg over 30min not to exceed 50mg, and then 0.5 mg/kg over the next 60min not to exceed 35mg for a total maximum of 100mg)	patients with anterior AMI	Parallel groups open Spain
GUSTO 2B , 1997 n=573/565 follow-up: 30 d	primary PTCA versus accelerated t-PA 90 min (15 mg IV bolus followed by an infusion of 0.75 mg/kg over 30min not to exceed 50mg, and then 0.5 mg/kg over the next 60min not to exceed 35mg for a total maximum of 100mg)	patients within 12 hours of acute myocardial infarction (with ST-segment elevation on the electrocardiogram)	factorial design open USA, Europe, Australia

continued...

Trial	Treatments	Patients	Trials design and methods
DANAMI-2 , 1997 n=NA follow-up: 2.4y	angioplasty versus accelerated treatment with intravenous alteplase	patients who received thrombolytic treatment for a first acute myocardial infarction and with inducible myocardial ischemia (either symptomatic angina pectoris presenting spontaneously >36 hours after admission or during a predischage exercise test or ST changes during exercise compatible with ischemia)	Parallel groups open
primary ballon angioplasty vs duteplase			
DeWood , 1989 n=46/44 follow-up: 30 d	primary PTCA versus duteplase 0.5 MU/kg for 1 h then 0.7 MU/kg/h for 3h	-	Parallel groups open USA
Gibbons , 1993 n=47/56 follow-up: discharge	primary PTCA versus duteplase 0.6 MU/kg over 5h	patients with acute myocardial infarction	Parallel groups open USA
transfer for primary angioplasty vs immediate thrombolysis			
AIR-PAMI , 2002 n=71/66 follow-up:	Transfer for Primary Angioplasty versus immediate thrombolysis (various thrombolytic)	Patients with high-risk AMI (age >70 years, anterior MI, Killip class II/III, heart rate >100 beats/min or systolic BP <100 mm Hg), eligible for thrombolytic therapy	Parallel groups open
DANAMI-2 , 2003 n=567/562 follow-up: 30 days	Transfer for Primary Angioplasty versus immediate thrombolysis with tPA (accelared infusion)	patients with myocardial infarction with ST-segment elevation	Parallel groups open
PRAGUE-2 , 2003 n=429/421 follow-up: 30 days	immediate transport for primary percutaneous coronary intervention versus immediate thrombolysis with streptokinase	patients with acute ST elevation myocardial infarction presenting within <12 h to the nearest community hospital without a catheter laboratory	Parallel groups open
primary ballon angioplasty vs intracoronary streptokinase			
O'Neill , 1986 n=NA follow-up:	coronary angioplasty versus intracoronary streptokinase	patients within 12 hours of their first symptoms of acute myocardial infarction	Parallel groups open
primary ballon angioplasty vs streptokinase			

continued...

Trial	Treatments	Patients	Trials design and methods
Zwolle , 1994 n=152/149 follow-up: discharge	primary PTCA versus streptokinase 1.5 M IU over 1h	patients with acute myocardial infarction	Parallel groups open The Netherland
Ribeiro , 1993 n=50/50 follow-up: discharge	primary PTCA versus streptokinase 1.2 M IU over 1h	patients with ST segment elevation within 6 h of the onset of chest pain	Parallel groups open Brazil
Grinfeld , 1996 n=54/58 follow-up: 30 d	primary PTCA versus streptokinase 1.5 M IU over 1h	-	Parallel groups open Argentina
Zijlstra , 1997 n=45/50 follow-up: 6 months	primary PTCA versus streptokinase 1.5 M IU over 1h	patients with acute myocardial infarction	Parallel groups open The Netherland
Zijlstra , 1993 n=70/72 follow-up:	immediate coronary angioplasty (without previous thrombolytic therapy) versus intravenous streptokinase	patients with acute myocardial infarction	Parallel groups open
Akhras , 1997 n=42/45 follow-up:	primary angioplasty versus streptokinase	patient within 12hr from onset of AMI	Parallel groups open Saudi Arabia
primary ballon angioplasty vs t-PA			
PAMI , 1993 n=195/200 follow-up: discharge	primary PTCA versus t-PA 100mg (or 1.25mg/kg for patients weighting less than 65kg) over 3 h	patients who presented within 12 hours of the onset of myocardial infarction	Parallel groups open USA,Europe
primary ballon angioplasty vs tenecteplase			
TRIANA , 2009 [NCT00257309] n=132/134 follow-up: 30 days (12 months)	Tenecteplase + UFH (+/- clopidogrel) versus Primary angioplasty	>=75 years old with ST-segment elevation or LBBB AMI <6 hours of evolution without contraindications for thrombolytic therapy	Parallel groups open

More details and results :

- myocardial revascularization for acute myocardial infarction in all type of patients at <http://www.trialresultscenter.org/go-Q129>
- PCI for acute myocardial infarction in all type of patients at <http://www.trialresultscenter.org/go-Q246>

- myocardial revascularization for acute myocardial infarction in patients in cardiogenic shock at <http://www.trialresultscenter.org/go-Q248>
- PCI for acute myocardial infarction in Elderly patients at <http://www.trialresultscenter.org/go-Q316>
- myocardial revascularization for acute myocardial infarction in Elderly patients at <http://www.trialresultscenter.org/go-Q317>

References

MAASTRICHT (Vermeer), 1999:

Vermeer F, Oude Ophuis AJ, vd Berg EJ, Brunninkhuis LG, Werter CJ, Boehmer AG, Lousberg AH, Dassen WR, Br FW Prospective randomised comparison between thrombolysis, rescue PTCA, and primary PTCA in patients with extensive myocardial infarction admitted to a hospital without PTCA facilities: a safety and feasibility study. *Heart* 1999;82:426-31 [[10490554](#)]

PRAGUE-1, 2000:

Widimsk P, Groch L, Zelzko M, Aschermann M, Bednr F, Suryapranata H Multicentre randomized trial comparing transport to primary angioplasty vs immediate thrombolysis vs combined strategy for patients with acute myocardial infarction presenting to a community hospital without a catheterization laboratory. The PRAGUE study. *Eur Heart J* 2000;21:823-31 [[10781354](#)]

AIR-PAMI, 2002:

Grines CL, Westerhausen DR Jr, Grines LL, Hanlon JT, Logemann TL, Niemela M, Weaver WD, Graham M, Boura J, O'Neill WW, Balestrini C A randomized trial of transfer for primary angioplasty versus on-site thrombolysis in patients with high-risk myocardial infarction: the Air Primary Angioplasty in Myocardial Infarction study. *J Am Coll Cardiol* 2002;39:1713-9 [[12039480](#)]

CAPTIM, 2002:

Bonnefoy E, Lapostolle F, Leizorovicz A, Steg G, McFadden EP, Dubien PY, Cattan S, Boullenger E, Machecourt J, Lacroute JM, Cassagnes J, Dissait F, Touboul P Primary angioplasty versus prehospital fibrinolysis in acute myocardial infarction: a randomised study. *Lancet* 2002;360:825-9 [[12243916](#)]

DANAMI-2, 2003:

Fosbl EL, Thune JJ, Kelbaek H, Andersen HR, Saunamki K, Nielsen TT, Mortensen LS, Kber L Long-term outcome of primary angioplasty compared with fibrinolysis across age groups: a Danish Multicenter Randomized Study on Fibrinolytic Therapy Versus Acute Coronary Angioplasty in Acute Myocardial Infarction (DANAMI-2) substudy. *Am Heart J* 2008 Aug;156:391-6 [[18657676](#)]

Madsen JK, Grande P, Saunamki K, Thayssen P, Kassis E, Eriksen U, Rasmussen K, Hauns S, Nielsen TT, Haghfelt T, Fritz-Hansen P, Hjelms E, Paulsen PK, Alstrup P, Arendrup H, Niebuhr-Jrgensen U, Andersen LI Danish multicenter randomized study of invasive versus conservative treatment in patients with inducible ischemia after thrombolysis in acute myocardial infarction (DANAMI). DANish trial in Acute Myocardial Infarction. *Circulation* 1997 Aug 5;96:748-55 [[9264478](#)]

Madsen JK, Nielsen TT, Grande P, Eriksen UH, Saunamki K, Thayssen P, Kassis E, Rasmussen K, Hauns S, Haghfelt T, Fritz-Hansen P, Hjelms E, Paulsen PK, Alstrup P, Arendrup H, Niebuhr-Jrgensen U, Andersen LI Revascularization compared to medical treatment in patients with silent vs. symptomatic residual ischemia after thrombolysed myocardial infarction—the DANAMI study. *Cardiology* 2007;108:243-51 [[17114878](#)]

Andersen HR, Nielsen TT, Rasmussen K, Thuesen L, Kelbaek H, Thayssen P, Abildgaard U, Pedersen F, Madsen JK, Grande P, Villadsen AB, Krusell LR, Haghfelt T, Lomholt P, Husted SE, Vigholt E, Kjaergard HK, Mortensen LS A comparison of coronary angioplasty with fibrinolytic therapy in acute myocardial infarction. *N Engl J Med* 2003 Aug 21;349:733-42 [[12930925](#)]

PRAGUE-2, 2003:

Widimsk P, Budesnsk T, Vorc D, Groch L, Zelzko M, Aschermann M, Branny M, St'sek J, Formnek P Long distance transport for primary angioplasty vs immediate thrombolysis in acute myocardial infarction. Final results of the randomized national multicentre trial-PRAGUE-2. Eur Heart J 2003;24:94-104 [[12559941](#)]

ECSG, 1988:

Simoons ML, Arnold AE, Betriu A, de Bono DP, Col J, Dougherty FC, von Essen R, Lambertz H, Lubsen J, Meier B, et al, Thrombolysis with tissue plasminogen activator in acute myocardial infarction: no additional benefit from immediate percutaneous coronary angioplasty. Lancet 1988; 1:197-203 [[2893037](#)]

Arnold AE, Simoons ML, Van de Werf F, de Bono DP, Lubsen J, Tijssen JG, Serruys PW, Verstraete M Recombinant tissue-type plasminogen activator and immediate angioplasty in acute myocardial infarction. One-year follow-up. The European Cooperative Study Group. Circulation 1992 Jul;86:111-20 [[1617763](#)]

Belenkie, 1991:

Belenkie I, Knudtson ML, Roth DL, Hansen JL, Traboulsi M, Hall CA, Manyari D, Filipchuck NG, Schnurr LP, Rosenal TW Relation between flow grade after thrombolytic therapy and the effect of angioplasty on left ventricular function: a prospective randomized trial. Am Heart J 1991 Feb;121:407-16 [[1990744](#)]

Ellis, 1994:

Ellis SG, da Silva ER, Heyndrickx G, Talley JD, Cernigliaro C, Steg G, Spaulding C, Nobuyoshi M, Erbel R, Vassanelli C Randomized comparison of rescue angioplasty with conservative management of patients with early failure of thrombolysis for acute anterior myocardial infarction. Circulation 1994;90:2280-4 [[7955184](#)]

Erbel, 1989:

Erbel R, Pop T, Diefenbach C, Meyer J Long-term results of thrombolytic therapy with and without percutaneous transluminal coronary angioplasty. J Am Coll Cardiol 1989;14:276-85; discussion 286-8 [[2526830](#)]

MERLIN (Sutton), 2004:

Sutton AG, Campbell PG, Graham R, Price DJ, Gray JC, Grech ED, Hall JA, Harcombe AA, Wright RA, Smith RH, Murphy JJ, Shyam-Sundar A, Stewart MJ, Davies A, Linker NJ, de Belder MA A randomized trial of rescue angioplasty versus a conservative approach for failed fibrinolysis in ST-segment elevation myocardial infarction: the Middlesbrough Early Revascularization to Limit Infarction (MERLIN) trial. J Am Coll Cardiol 2004;44:287-96 [[15261920](#)]

SHOCK (Hochman), 1999:

Hochman JS, Sleeper LA, Webb JG, Sanborn TA, White HD, Talley JD, Buller CE, Jacobs AK, Slater JN, Col J, McKinlay SM, LeJemtel TH Early revascularization in acute myocardial infarction complicated by cardiogenic shock. SHOCK Investigators. Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock. N Engl J Med 1999;341:625-34 [[10460813](#)]

Hochman JS, Sleeper LA, Webb JG, Dzavik V, Buller CE, Aylward P, Col J, White HD Early revascularization and long-term survival in cardiogenic shock complicating acute myocardial infarction. JAMA 2006 Jun 7;295:2511-5 [[16757723](#)]

Hochman JS, Sleeper LA, White HD, Dzavik V, Wong SC, Menon V, Webb JG, Steingart R, Picard MH, Menegus MA, Boland J, Sanborn T, Buller CE, Modur S, Forman R, Desvigne-Nickens P, Jacobs AK, Slater JN, LeJemtel TH One-year survival following early revascularization for cardiogenic shock. JAMA 2001 Jan 10;285:190-2 [[11176812](#)]

SWISS-SMASH, 1999:

Urban P, Stauffer JC, Bleed D, Khatchatrian N, Amann W, Bertel O, van den Brand M, Danchin N, Kaufmann U, Meier B, Machecourt J, Pfisterer M A randomized evaluation of early revascularization to treat shock complicating acute myocardial infarction. The (Swiss) Multicenter Trial of Angioplasty for Shock-(S)MASH. Eur Heart J 1999 Jul;20:1030-8 [[10383377](#)]

TAMI 1 pilot, 1987:

Topol EJ, Califf RM, George BS, Kereiakes DJ, Abbottsmith CW, Candela RJ, Lee KL, Pitt B, Stack RS, O'Neill WW A randomized trial of immediate versus delayed elective angioplasty after intravenous tissue plasminogen activator in acute myocardial infarction. N Engl J Med 1987 Sep 3;317:581-8 [[2956516](#)]

TAMI-5 (Califf), 1991:

Califf RM, Topol EJ, Stack RS, Ellis SG, George BS, Kereiakes DJ, Samaha JK, Worley SJ, Anderson JL, Harrelson-Woodlief L Evaluation of combination thrombolytic therapy and timing of cardiac catheterization in acute myocardial infarction. Results of thrombolysis and angioplasty in myocardial infarction—phase 5 randomized trial. TAMI Study Group. *Circulation* 1991;83:1543-56 [1902405]

TIMI 2A, 1988:

Immediate vs delayed catheterization and angioplasty following thrombolytic therapy for acute myocardial infarction. TIMI II A results. The TIMI Research Group. *JAMA* 1988 Nov 18;260:2849-58 [2972848]

Topol, 1987:

Topol EJ, O'Neill WW, Langburd AB, Walton JA Jr, Bourdillon PD, Bates ER, Grines CL, Schork AM, Kline E, Pitt B A randomized, placebo-controlled trial of intravenous recombinant tissue-type plasminogen activator and emergency coronary angioplasty in patients with acute myocardial infarction. *Circulation* 1987 Feb;75:420-8 [2948735]

SWIFT, 1991:

, SWIFT trial of delayed elective intervention v conservative treatment after thrombolysis with anistreplase in acute myocardial infarction. SWIFT (Should We Intervene Following Thrombolysis?) Trial Study Group. *BMJ* 1991; 302:555-60 [2021717]

SIAM, 1992:

JACC 1992 19:239A(abstract) [0]

TAMI 6, 1992:

Topol EJ, Califf RM, Vandormael M, Grines CL, George BS, Sanz ML, Wall T, O'Brien M, Schwaiger M, Aguirre FV A randomized trial of late reperfusion therapy for acute myocardial infarction. Thrombolysis and Angioplasty in Myocardial Infarction-6 Study Group. *Circulation* 1992 Jun;85:2090-9 [1591828]

Barbash, 1990:

Barbash GI, Roth A, Hod H, Modan M, Miller HI, Rath S, Zahav YH, Keren G, Motro M, Shachar A Randomized controlled trial of late in-hospital angiography and angioplasty versus conservative management after treatment with recombinant tissue-type plasminogen activator in acute myocardial infarction. *Am J Cardiol* 1990 Sep 1;66:538-45 [2118299]

Guerci, 1987:

Guerci AD, Gerstenblith G, Brinker JA, Chandra NC, Gottlieb SO, Bahr RD, Weiss JL, Shapiro EP, Flaherty JT, Bush DE, et al, A randomized trial of intravenous tissue plasminogen activator for acute myocardial infarction with subsequent randomization to elective coronary angioplasty. *N Engl J Med* 1987; 317:1613-8 [2960897]

TIMI 2, 1989:

, Comparison of invasive and conservative strategies after treatment with intravenous tissue plasminogen activator in acute myocardial infarction. Results of the thrombolysis in myocardial infarction (TIMI) phase II trial. The TIMI Study Group. *N Engl J Med* 1989; 320:618-27 [2563896]

TIMI II-A (deferred), 0:

Rogers WJ, Baim DS, Gore JM, Brown BG, Roberts R, Williams DO, Chesebro JH, Babb JD, Sheehan FH, Wackers FJ Comparison of immediate invasive, delayed invasive, and conservative strategies after tissue-type plasminogen activator. Results of the Thrombolysis in Myocardial Infarction (TIMI) Phase II-A trial. *Circulation* 1990;81:1457-76 [2110033]

TOPS, 1992:

Ellis SG, Mooney MR, George BS, da Silva EE, Talley JD, Flanagan WH, Topol EJ Randomized trial of late elective angioplasty versus conservative management for patients with residual stenoses after thrombolytic treatment of myocardial infarction. Treatment of Post-Thrombolytic Stenoses (TOPS) Study Group. *Circulation*

1992 Nov;86:1400-6 [[1423952](#)]

Van den Brand, 1991:

Eur Heart J 1991;12:96 (abstract) [[0](#)]

Vermeer, 1999:

Vermeer F, Oude Ophuis AJ, vd Berg EJ, Brunninkhuis LG, Werter CJ, Boehmer AG, Lousberg AH, Dassen WR, Br FW Prospective randomised comparison between thrombolysis, rescue PTCA, and primary PTCA in patients with extensive myocardial infarction admitted to a hospital without PTCA facilities: a safety and feasibility study. Heart 1999;82:426-31 [[10490554](#)]

NORDISTEMI, 2009:

CARESS, 2008:

Di Mario C, Dudek D, Piscione F, Mielecki W, Savonitto S, Murena E, Dimopoulos K, Manari A, Gaspardone A, Ochala A, Zmudka K, Bolognese L, Steg PG, Flather M Immediate angioplasty versus standard therapy with rescue angioplasty after thrombolysis in the Combined Abciximab REteplase Stent Study in Acute Myocardial Infarction (CARESS-in-AMI): an open, prospective, randomised, multicentre trial. Lancet 2008;371:559-68 [[18280326](#)]

Di Mario C, Bolognese L, Maillard L, Dudek D, Gambarati G, Manari A, Guiducci V, Patrizi G, Rusconi LC, Piovaccari G, Hibon AR, Belpomme V, Indolfi C, Olivari Z, Steffenino G, Zmudka K, Airoidi F, Panzarasa R, Flather M, Steg PG Combined Abciximab REteplase Stent Study in acute myocardial infarction (CARESS in AMI). Am Heart J 2004;148:378-85 [[15389222](#)]

CAPITAL AMI, 2005:

Le May MR, Wells GA, Labinaz M, Davies RF, Turek M, Leddy D, Maloney J, McKibbin T, Quinn B, Beanlands RS, Glover C, Marquis JF, O'Brien ER, Williams WL, Higginson LA Combined angioplasty and pharmacological intervention versus thrombolysis alone in acute myocardial infarction (CAPITAL AMI study). J Am Coll Cardiol 2005 Aug 2;46:417-24 [[16053952](#)]

PRAGUE-1 (thrombolysis+PTCA), 2000:

Widimsk P, Groch L, Zelzko M, Aschermann M, Bednr F, Suryapranata H Multicentre randomized trial comparing transport to primary angioplasty vs immediate thrombolysis vs combined strategy for patients with acute myocardial infarction presenting to a community hospital without a catheterization laboratory. The PRAGUE study. Eur Heart J 2000;21:823-31 [[10781354](#)]

TRANSFER-AMI, 2008:

ongoing trial NCT00164190

Cantor WJ, Fitchett D, Borgundvaag B, Heffernan M, Cohen EA, Morrison LJ, Ducas J, Langer A, Mehta S, Lazzam C, Schwartz B, Dzavik V, Goodman SG Rationale and design of the Trial of Routine ANgioplasty and Stenting After Fibrinolysis to Enhance Reperfusion in Acute Myocardial Infarction (TRANSFER-AMI). Am Heart J 2008;155:19-25 [[18082484](#)]

Cantor WJ, Fitchett D, Borgundvaag B, Ducas J, Heffernan M, Cohen EA, Morrison LJ, Langer A, Dzavik V, Mehta SR, Lazzam C, Schwartz B, Casanova A, Goodman SG Routine early angioplasty after fibrinolysis for acute myocardial infarction. N Engl J Med 2009 Jun 25;360:2705-18 [[19553646](#)]

Ribichini, 1996:

JACC 1996; 21:1A [[0](#)]

Garcia, 1997:

Garca E, Elzaga J, Prez-Castellano N, Serrano JA, Soriano J, Abeytua M, Botas J, Rubio R, Lpez de S E, Lpez-Sendn JL, Delcn JL Primary angioplasty versus systemic thrombolysis in anterior myocardial infarction. J Am Coll Cardiol 1999;33:605-11 [[10080458](#)]

GUSTO 2B, 1997:

A clinical trial comparing primary coronary angioplasty with tissue plasminogen activator for acute myocardial infarction. The Global Use of Strategies to Open Occluded Coronary Arteries in Acute Coronary Syndromes (GUSTO IIb) Angioplasty Substudy Investigators. *N Engl J Med* 1997;336:1621-8 [[9173270](#)]

DANAMI-2, 1997:

Fosbl EL, Thune JJ, Kelbaek H, Andersen HR, Saunamki K, Nielsen TT, Mortensen LS, Kber L Long-term outcome of primary angioplasty compared with fibrinolysis across age groups: a Danish Multicenter Randomized Study on Fibrinolytic Therapy Versus Acute Coronary Angioplasty in Acute Myocardial Infarction (DANAMI-2) substudy. *Am Heart J* 2008;156:391-6 [[18657676](#)]

Madsen JK, Grande P, Saunamki K, Thayssen P, Kassis E, Eriksen U, Rasmussen K, Hauns S, Nielsen TT, Haghfelt T, Fritz-Hansen P, Hjelms E, Paulsen PK, Alstrup P, Arendrup H, Niebuhr-Jrgensen U, Andersen LI Danish multicenter randomized study of invasive versus conservative treatment in patients with inducible ischemia after thrombolysis in acute myocardial infarction (DANAMI). DANish trial in Acute Myocardial Infarction. *Circulation* 1997 Aug 5;96:748-55 [[9264478](#)]

Madsen JK, Nielsen TT, Grande P, Eriksen UH, Saunamki K, Thayssen P, Kassis E, Rasmussen K, Hauns S, Haghfelt T, Fritz-Hansen P, Hjelms E, Paulsen PK, Alstrup P, Arendrup H, Niebuhr-Jrgensen U, Andersen LI Revascularization compared to medical treatment in patients with silent vs. symptomatic residual ischemia after thrombolysed myocardial infarction—the DANAMI study. *Cardiology* 2007;108:243-51 [[17114878](#)]

Andersen HR, Nielsen TT, Rasmussen K, Thuesen L, Kelbaek H, Thayssen P, Abildgaard U, Pedersen F, Madsen JK, Grande P, Villadsen AB, Krusell LR, Haghfelt T, Lomholt P, Husted SE, Vigholt E, Kjaergard HK, Mortensen LS A comparison of coronary angioplasty with fibrinolytic therapy in acute myocardial infarction. *N Engl J Med* 2003 Aug 21;349:733-42 [[12930925](#)]

Nielsen PH, Maeng M, Busk M, Mortensen LS, Kristensen SD, Nielsen TT, Andersen HR Primary angioplasty versus fibrinolysis in acute myocardial infarction: long-term follow-up in the Danish acute myocardial infarction 2 trial. *Circulation* 2010;121:1484-91 [[20308618](#)] [10.1161/CIRCULATIONAHA.109.873224](#)

DeWood, 1989:

DeWood MA, Fisher MJ for the spokane Heart Research Group *Circulation* 1989; 80(suppl 2):II418

Gibbons, 1993:

Gibbons RJ, Holmes DR, Reeder GS, Bailey KR, Hopfenspirger MR, Gersh BJ Immediate angioplasty compared with the administration of a thrombolytic agent followed by conservative treatment for myocardial infarction. The Mayo Coronary Care Unit and Catheterization Laboratory Groups. *N Engl J Med* 1993;328:685-91 [[8433727](#)]

AIR-PAMI , 2002:

Grines CL, Westerhausen DR Jr, Grines LL, Hanlon JT, Logemann TL, Niemela M, Weaver WD, Graham M, Boura J, O'Neill WW, Balestrini C A randomized trial of transfer for primary angioplasty versus on-site thrombolysis in patients with high-risk myocardial infarction: the Air Primary Angioplasty in Myocardial Infarction study. *J Am Coll Cardiol* 2002;39:1713-9 [[12039480](#)]

DANAMI-2 , 2003:

Fosbl EL, Thune JJ, Kelbaek H, Andersen HR, Saunamki K, Nielsen TT, Mortensen LS, Kber L Long-term outcome of primary angioplasty compared with fibrinolysis across age groups: a Danish Multicenter Randomized Study on Fibrinolytic Therapy Versus Acute Coronary Angioplasty in Acute Myocardial Infarction (DANAMI-2) substudy. *Am Heart J* 2008 Aug;156:391-6 [[18657676](#)]

Madsen JK, Grande P, Saunamki K, Thayssen P, Kassis E, Eriksen U, Rasmussen K, Hauns S, Nielsen TT, Haghfelt T, Fritz-Hansen P, Hjelms E, Paulsen PK, Alstrup P, Arendrup H, Niebuhr-Jrgensen U, Andersen LI Danish multicenter randomized study of invasive versus conservative treatment in patients with inducible ischemia after thrombolysis in acute myocardial infarction (DANAMI). DANish trial in Acute Myocardial Infarction. *Circulation* 1997 Aug 5;96:748-55 [[9264478](#)]

Madsen JK, Nielsen TT, Grande P, Eriksen UH, Saunamki K, Thayssen P, Kassis E, Rasmussen K, Hauns S, Haghfelt T, Fritz-Hansen P, Hjelms E, Paulsen PK, Alstrup P, Arendrup H, Niebuhr-Jrgensen U, Andersen LI Revascularization compared to medical treatment in patients with silent vs. symptomatic residual ischemia

after thrombolysed myocardial infarction—the DANAMI study. *Cardiology* 2007;108:243-51 [17114878]

Andersen HR, Nielsen TT, Rasmussen K, Thuesen L, Kelbaek H, Thayssen P, Abildgaard U, Pedersen F, Madsen JK, Grande P, Villadsen AB, Krusell LR, Haghfelt T, Lomholt P, Husted SE, Vigholt E, Kjaergard HK, Mortensen LS A comparison of coronary angioplasty with fibrinolytic therapy in acute myocardial infarction. *N Engl J Med* 2003 Aug 21;349:733-42 [12930925]

PRAGUE-2 , 2003:

Widimsk P, Budesnsk T, Vorc D, Groch L, Zelzko M, Aschermann M, Branny M, St'sek J, Formnek P Long distance transport for primary angioplasty vs immediate thrombolysis in acute myocardial infarction. Final results of the randomized national multicentre trial—PRAGUE-2. *Eur Heart J* 2003;24:94-104 [12559941]

Widimsk P, Budesnsk T, Vorc D, Groch L, Zelzko M, Aschermann M, Branny M, St'sek J, Formnek P Long distance transport for primary angioplasty vs immediate thrombolysis in acute myocardial infarction. Final results of the randomized national multicentre trial—PRAGUE-2. *Eur Heart J* 2003;24:94-104 [12559941]

O'Neill, 1986:

O'Neill W, Timmis GC, Bourdillon PD, Lai P, Ganghadarhan V, Walton J Jr, Ramos R, Laufer N, Gordon S, Schork MA A prospective randomized clinical trial of intracoronary streptokinase versus coronary angioplasty for acute myocardial infarction. *N Engl J Med* 1986;314:812-8 [2936956]

Zwolle, 1994:

de Boer MJ, Hoorntje JC, Ottervanger JP, Reiffers S, Suryapranata H, Zijlstra F Immediate coronary angioplasty versus intravenous streptokinase in acute myocardial infarction: left ventricular ejection fraction, hospital mortality and reinfarction. *J Am Coll Cardiol* 1994;23:1004-8 [8144761]

Ribeiro, 1993:

Ribeiro EE, Silva LA, Carneiro R, D'Oliveira LG, Gasquez A, Amino JG, Tavares JR, Petrizzo A, Torossian S, Duprat Filho R Randomized trial of direct coronary angioplasty versus intravenous streptokinase in acute myocardial infarction. *J Am Coll Cardiol* 1993;22:376-80 [8335807]

Grinfeld, 1996:

Grinfeld L et al. abstract *JACC* 1996;27:222A

Zijlstra, 1997:

Zijlstra F, Beukema WP, van 't Hof AW, Liem A, Reiffers S, Hoorntje JC, Suryapranata H, de Boer MJ Randomized comparison of primary coronary angioplasty with thrombolytic therapy in low risk patients with acute myocardial infarction. *J Am Coll Cardiol* 1997;29:908-12 [9120174]

Zijlstra , 1993:

Zijlstra F, de Boer MJ, Hoorntje JC, Reiffers S, Reiber JH, Suryapranata H A comparison of immediate coronary angioplasty with intravenous streptokinase in acute myocardial infarction. *N Engl J Med* 1993;328:680-4 [8433726]

Akhras, 1997:

Akhras F, AbuOusa A, Swann G, Duncan H, ChamsiPasha H, Jabbad H. Primary coronary angioplasty or intravenous thrombolysis for patients with acute myocardial infarction? acute and late follow-up results in a new cardiac unit [abstract4 *J Am Coll Cardiol.* 1997;29(suppl 1):A235

PAMI, 1993:

Grines CL, Browne KF, Marco J, Rothbaum D, Stone GW, O'Keefe J, Overlie P, Donohue B, Chelliah N, Timmis GC A comparison of immediate angioplasty with thrombolytic therapy for acute myocardial infarction. The Primary Angioplasty in Myocardial Infarction Study Group. *N Engl J Med* 1993;328:673-9 [8433725]

TRIANA, 2009:

Clauw et al The efficacy and safety of milnacpran in the treatment of fibromyalgia 2007, poster 716

Bueno H, Betriu A, Heras M, Alonso JJ, Cequier A, Garca EJ, Lpez-Sendn JL, Macaya C, Hernndez-Antoln R Primary angioplasty vs. fibrinolysis in very old patients with acute myocardial infarction: TRIANA (TRatamiento del Infarto Agudo de miocardio eN Ancianos) randomized trial and pooled analysis with previous

2 stable angina

Trial	Treatments	Patients	Trials design and methods
balloon angioplasty vs medical treatment			
RITA 2 , 1997 n=504/514 follow-up: 7y	PTCA within 3 mo of the randomisation versus medical treatment	Angina leading to admission within 90days, previous Q wave MI, no previousPTCA, no left main stem disease	Parallel groups open UK
ACME , 1992 n=105/107 follow-up: 5y	PTCA within 3 days of randomization versus medical treatment (nitrates, beta-blockers, calcium blockers)	Stable angina, history of angina, MIwithin 3 months, exercise test with STdepression >3 mm, no previous PTCA; Single or serial stenosis within sameartery 70% to 99% proximal twothirds	Parallel groups open US
ACME 2 (Folland) , 1997 n=51/50 follow-up: 5y	PTCA versus medical therapy	Stable angina, history of angina, MIwithin 3 months, exercise test with STdepression >3 mm, no previous PTCA; Stenosis >70% proximal two thirds,no main artery stenosis >50% , no 3vessel disease	Parallel groups open
ACIP , 1997 n=192/366 follow-up: 24 months	revascularization by angioplasty or bypass surgery versus angina-guided drug therapy or angina plus ischemia-guided drug therapy	clinically stable patients with angiographically documented coronary disease (50% stenosis in 1 major vessel or branch) suitable for revascularization	Parallel groups open
INSPIRE , 2006 n=104/101 follow-up: 60 months	coronary revascularization for suppressing scintigraphic ischemia versus intensive medical therapy strategy	Stable survivors of MI, total perfusion defect size 20% , ischemic defect size 10% (by adenosine SPECT), EF 35% t	Parallel groups open
SWISSI II , 2007 [NCT00387231] n=96/105 follow-up: 10.2y	Percutaneous coronary intervention aimed at full revascularization versus intensive anti-ischemic drug therapy	patients with a recent MI, silent myocardial ischemia verified by stress imaging, and 1- or 2-vessel coronary artery disease	Parallel groups open Switzerland
MASS , 1995 n=72/72 follow-up: 5y	PTCA versus medical treatment (aspirin, nitrates, beta-blockers and calcium channel blocking	Stable angina, no Q wave MI, no leftventricular dysfunction	Parallel groups open Brazil

continued...

Trial	Treatments	Patients	Trials design and methods
Sievers , 1993 n=44/44 follow-up: 2y	PTCA versus medical treatment	Previous nonQ wave MI, no angina indaily life, no previous Q wave MI	Parallel groups open Germany
balloon angioplasty vs CABG			
EAST , 1994 [NCT00000465] n=198/194 follow-up: 3 y	transluminal coronary angioplasty versus coronary-artery bypass grafting	patients with multivessels coronary artery disease	open USA
GABI , 1994 n=182/177 follow-up: 1 y	Percutaneous transluminal coronary angioplasty versus coronary-artery bypass grafting	patients with symptomatic multivessel coronary disease	open Germany
BARI , 1996 [NCT00000462] n=915/914 follow-up: 5.4 y	PTCA versus CABG	Patients with multivessel disease	open USA, Canada
RITA , 1993 n=510/501 follow-up: 2.5 y (6.5y)	percutaneous transluminal coronary angioplasty versus coronary artery bypass surgery	patients with one, two, or three diseased coronary arteries	open UK
ERACI , 1992 n=63/64 follow-up: 3.8 y	Percutaneous transluminal coronary angioplasty versus coronary artery bypass grafting	patients with multivessel disease and lesions suitable for either form of therapy	open Argentina
MASS , 1995 n=72/70 follow-up: 3.2 y	percutaneous transluminal coronaryangioplasty versus mammary bypass surgery	patients with stable angina,normal ventricular function and a proximal stenosis of the leftanterior descending coronary artery >80%	open Brazil
Toulouse , 1992 n=76/76 follow-up: 2.8 y	PTCA versus CABG	patients with multivessels coronary artery disease	open France
Lausanne , 1994 n=68/66 follow-up: 3.2 y	transluminal coronary angioplasty versus Coronary artery bypass grafting	patients with isolated proximal left anterior descending artery stenosis, conserved left ventricular function, and documented ischaemia	open Switzerland
CABRI , 1995 n=541/513 follow-up: 1 y	percutaneous transluminal coronary angioplasty versus coronary artery bypass grafting	patients with symptomatic multivessel coronary disease	open Europe

continued...

Trial	Treatments	Patients	Trials design and methods
angioplasty vs MIDCAB			
AMIST (Reeves) , 2004 n=50/50 follow-up: 12 months	percutaneous transluminal coronary angioplasty (PTCA) with or without stenting versus minimally invasive direct coronary artery bypass grafting (MIDCAB)	single-vessel disease (at least 50% stenosis) of the left anterior descending coronary artery (LAD).	Parallel groups open England

More details and results :

- myocardial revascularization for stable angina in all type of patient at <http://www.trialresultscenter.org/go-Q25>
- myocardial revascularization for stable angina in single vessel disease at <http://www.trialresultscenter.org/go-Q27>
- myocardial revascularization for stable angina in multivessels disease at <http://www.trialresultscenter.org/go-Q28>

References

RITA 2, 1997:

Coronary angioplasty versus medical therapy for angina: the second Randomised Intervention Treatment of Angina (RITA-2) trial. RITA-2 trial participants Lancet 1997;350:461-8 [9274581]

Henderson RA, Pocock SJ, Clayton TC, Knight R, Fox KA, Julian DG, Chamberlain DA Seven-year outcome in the RITA-2 trial: coronary angioplasty versus medical therapy J Am Coll Cardiol 2003;42:1161-70 [14522473]

ACME, 1992:

Parisi AF, Folland ED, Hartigan P A comparison of angioplasty with medical therapy in the treatment of single-vessel coronary artery disease. Veterans Affairs ACME Investigators N Engl J Med 1992;326:10-6 [1345754]

Hartigan PM, Giacomini JC, Folland ED, Parisi AF Two- to three-year follow-up of patients with single-vessel coronary artery disease randomized to PTCA or medical therapy (results of a VA cooperative study). Veterans Affairs Cooperative Studies Program ACME Investigators. Angioplasty Compared to Medicine Am J Cardiol 1998;82:1445-50 [9874045]

ACME 2 (Folland), 1997:

Folland ED, Hartigan PM, Parisi AF Percutaneous transluminal coronary angioplasty versus medical therapy for stable angina pectoris: outcomes for patients with double-vessel versus single-vessel coronary artery disease in a Veterans Affairs Cooperative randomized trial. Veterans Affairs ACME InvestigatorS J Am Coll Cardiol 1997;29:1505-11 [9180111]

Henderson RA, Pocock SJ, Clayton TC, Knight R, Fox KA, Julian DG, Chamberlain DA Seven-year outcome in the RITA-2 trial: coronary angioplasty versus medical therapy J Am Coll Cardiol 2003;42:1161-70 [14522473]

ACIP, 1997:

Davies RF, Goldberg AD, Forman S, Pepine CJ, Knatterud GL, Geller N, Sopko G, Pratt C, Deanfield J, Conti CR Asymptomatic Cardiac Ischemia Pilot (ACIP) study two-year follow-up: outcomes of patients randomized to initial strategies of medical therapy versus revascularization. Circulation 1997;95:2037-43 [9133513]

INSPIRE, 2006:

Mahmarian JJ, Dakik HA, Filipchuk NG, Shaw LJ, Iskander SS, Ruddy TD, Keng F, Henzlova MJ, Allam A, Moy LA, Pratt CM An initial strategy of intensive medical therapy is comparable to that of coronary revascularization for suppression of scintigraphic ischemia in high-risk but stable survivors of acute myocardial infarction. *J Am Coll Cardiol* 2006;48:2458-67 [[17174182](#)]

SWISSI II, 2007:

Erne P, Schoenenberger AW, Burckhardt D, Zuber M, Kiowski W, Buser PT, Dubach P, Resink TJ, Pfisterer M Effects of percutaneous coronary interventions in silent ischemia after myocardial infarction: the SWISSI II randomized controlled trial. *JAMA* 2007;297:1985-91 [[17488963](#)]

MASS, 1995:

Hueb WA, Bellotti G, de Oliveira SA, Arie S, de Albuquerque CP, Jatene AD, Pileggi F The Medicine, Angioplasty or Surgery Study (MASS): a prospective, randomized trial of medical therapy, balloon angioplasty or bypass surgery for single proximal left anterior descending artery stenoses *J Am Coll Cardiol* 1995;26:1600-5 [[7594092](#)] [10.1016/0735-1097\(95\)00384-3](#)

Sievers, 1993:

Sievers N, Hamm CW, Herzner A, Kuck KH Medical therapy versus PTCA: a prospective, randomized trial in patients with asymptomatic coronary single-vessel disease. Abstract. *Circulation*. 1993;88(suppl I):I-297 [0]

EAST, 1994:

King SB 3rd, Lembo NJ, Weintraub WS, Kosinski AS, Barnhart HX, Kutner MH, Alazraki NP, Guyton RA, Zhao XQ A randomized trial comparing coronary angioplasty with coronary bypass surgery. Emory Angioplasty versus Surgery Trial (EAST) *N Engl J Med* 1994 Oct 20;331:1044-50 [[8090163](#)]

GABI, 1994:

Hamm CW, Reimers J, Ischinger T, Rupprecht HJ, Berger J, Bleifeld W A randomized study of coronary angioplasty compared with bypass surgery in patients with symptomatic multivessel coronary disease. German Angioplasty Bypass Surgery Investigation (GABI) *N Engl J Med* 1994 Oct 20;331:1037-43 [[8090162](#)]

BARI, 1996:

Comparison of coronary bypass surgery with angioplasty in patients with multivessel disease. The Bypass Angioplasty Revascularization Investigation (BARI) Investigators. *N Engl J Med* 1996 Jul 25;335:217-25 [[8657237](#)]

RITA, 1993:

Coronary angioplasty versus coronary artery bypass surgery: the Randomized Intervention Treatment of Angina (RITA) trial. *Lancet* 1993 Mar 6;341:573-80 [[8094826](#)]

ERACI, 1992:

Rodriguez A, Bouillon F, Perez-Balino N, Paviotti C, Liprandi MI, Palacios IF Argentine randomized trial of percutaneous transluminal coronary angioplasty versus coronary artery bypass surgery in multivessel disease (ERACI): in-hospital results and 1-year follow-up. ERACI Group. *J Am Coll Cardiol* 1993 Oct;22:1060-7 [[8409041](#)]

MASS, 1995:

Hueb WA, Bellotti G, de Oliveira SA, Arie S, de Albuquerque CP, Jatene AD, Pileggi F The Medicine, Angioplasty or Surgery Study (MASS): a prospective, randomized trial of medical therapy, balloon angioplasty or bypass surgery for single proximal left anterior descending artery stenoses. *J Am Coll Cardiol* 1995 Dec;26:1600-5 [[7594092](#)]

Toulouse, 1992:**Lausanne, 1994:**

Goy JJ, Eeckhout E, Burnand B, Vogt P, Stauffer JC, Hurni M, Stumpe F, Ruchat P, Sadeghi H, Kappenberger L Coronary angioplasty versus left internal mammary artery grafting for isolated proximal left anterior descending artery stenosis. *Lancet* 1994 Jun 11;343:1449-53 [[7911175](#)]

CABRI, 1995:

First-year results of CABRI (Coronary Angioplasty versus Bypass Revascularisation Investigation). CABRI Trial Participants. Lancet 1995 Nov 4;346:1179-84 [7475656]

Martuscelli E, Clementi F, Gallagher MM, D'Eliseo A, Chiricolo G, Nigri A, Marino B, Romeo F Revascularization strategy in patients with multivessel disease and a major vessel chronically occluded; data from the CABRI trial. Eur J Cardiothorac Surg 2008;33:4-8 [17988889]

AMIST (Reeves), 2004:

Reeves BC, Angelini GD, Bryan AJ, Taylor FC, Cripps T, Spyt TJ, Samani NJ, Roberts JA, Jacklin P, Seehra HK, Culliford LA, Keenan DJ, Rowlands DJ, Clarke B, Stanbridge R, Foale R A multi-centre randomised controlled trial of minimally invasive direct coronary bypass grafting versus percutaneous transluminal coronary angioplasty with stenting for proximal stenosis of the left anterior descending coronary artery. Health Technol Assess 2004;8:1-43 [15080865]

3 hypertension

Trial	Treatments	Patients	Trials design and methods
angioplasty vs medical therapy			
EMMA , 1998 n=23/26 follow-up: 6 months	angioplasty versus antihypertensive drug treatment	hypertensive patients with atherosclerotic renal artery stenosis.	Parallel groups open France
SNRASCG , 1998 n=25/30 follow-up: 12 months	percutaneous transluminal angioplasty versus medical therapy	hypertensive patients with unilateral or bilateral disease	Parallel groups United Kingdom
DRASTIC , 2000 n=56/50 follow-up: 12 months	percutaneous transluminal renal angioplasty versus drug therapy	patients with hypertension who had atherosclerotic renal-artery stenosis (defined as a decrease in luminal diameter of 50 percent or more) and a serum creatinine concentration of 2.3 mg per deciliter (200 micromol per liter) or less	Parallel groups open Netherlands
ASTRAL , 2009 n=403/403 follow-up: 33.6 months	revascularization in addition to medical therapy versus medical therapy alone	patients with atherosclerotic renovascular disease	Parallel groups open United Kingdom, Australia, New Zealand
STAR , 2009 n=64/76 follow-up: 24 months	stent placement and medical treatment versus medical treatment alone (antihypertensive treatment, statin, aspirin)	patients with atherosclerotic renal artery stenosis and impaired renal function	Parallel groups open Netherlands, France
NITER , 2009 <i>unpublished</i> n=28/24 follow-up: 43 months	-	-	Italy

More details and results :

- angioplasty for hypertension in all type of patients at <http://www.trialresultscenter.org/go-Q496>

References

EMMA, 1998:

Plouin PF, Chatellier G, Darn B, Raynaud A Blood pressure outcome of angioplasty in atherosclerotic renal artery stenosis: a randomized trial. Essai Multicentrique Medicaments vs Angioplastie (EMMA) Study Group. Hypertension 1998;31:823-9 [9495267]

SNRASCG, 1998:

Webster J, Marshall F, Abdalla M, Dominiczak A, Edwards R, Isles CG, Loose H, Main J, Padfield P, Russell IT, Walker B, Watson M, Wilkinson R Randomised comparison of percutaneous angioplasty vs continued medical therapy for hypertensive patients with atheromatous renal artery stenosis. Scottish and Newcastle Renal Artery Stenosis Collaborative Group. J Hum Hypertens 1998;12:329-35 [9655655]

DRASTIC, 2000:

van Jaarsveld BC, Krijnen P, Pieterman H, Derkx FH, Deinum J, Postma CT, Dees A, Woittiez AJ, Bartelink AK, Man in 't Veld AJ, Schalekamp MA The effect of balloon angioplasty on hypertension in atherosclerotic renal-artery stenosis. Dutch Renal Artery Stenosis Intervention Cooperative Study Group. N Engl J Med 2000;342:1007-14 [10749962] 10.1056/NEJM200004063421403

ASTRAL, 2009:

Wheatley K, Ives N, Gray R, Kalra PA, Moss JG, Baigent C, Carr S, Chalmers N, Eadington D, Hamilton G, Lipkin G, Nicholson A, Scoble J Revascularization versus medical therapy for renal-artery stenosis. N Engl J Med 2009;361:1953-62 [19907042] 10.1056/NEJMoa0905368

STAR, 2009:

Bax L, Woittiez AJ, Kouwenberg HJ, Mali WP, Buskens E, Beek FJ, Braam B, Huysmans FT, Schultze Kool LJ, Rutten MJ, Doorenbos CJ, Aarts JC, Rabelink TJ, Plouin PF, Raynaud A, van Montfrans GA, Reekers JA, van den Meiracker AH, Pattynama PM, van de Ven PJ, Stent placement in patients with atherosclerotic renal artery stenosis and impaired renal function: a randomized trial. Ann Intern Med 2009;150:840-8, W150-1 [19414832]

NITER, 2009:

unpublished

Scarpioni R, Michieletti E, Pavone L, et al. Atherosclerotic renovascular disease (ARVD): medical therapy plus renal artery stenting (PRTS), compared with medical therapy alone, do not offer more chances in preventing C-V events or the progression of renal failure. Preliminary results of a prospective, multicenter and randomized trial Abstract World Congress of Nephrology; May 22, 2009; Milan, Italy; 2009.

4 coronary artery disease

Trial	Treatments	Patients	Trials design and methods
balloon angioplasty vs medical treatment			

continued...

Trial	Treatments	Patients	Trials design and methods
RITA 2 , 1997 n=504/514 follow-up: 7y	PTCA within 3 mo of the randomisation versus medical treatment	Angina leading to admission within 90days, previous Q wave MI, no previousPTCA, no left main stem disease	Parallel groups open UK
ACME , 1992 n=105/107 follow-up: 5y	PTCA within 3 days of randomization versus medical treatment (nitrates, beta-blockers, calcium blockers)	Stable angina, history of angina, MIwithin 3 months, exercise test with STdepression >3 mm, no previous PTCA; Single or serial stenosis within sameartery 70% to 99% proximal twothirds	Parallel groups open US
ACME 2 (Folland) , 1997 n=51/50 follow-up: 5y	PTCA versus medical therapy	Stable angina, history of angina, MIwithin 3 months, exercise test with STdepression >3 mm, no previous PTCA; Stenosis >70% proximal two thirds,no main artery stenosis >50% , no 3vessel disease	Parallel groups open
ACIP , 1997 n=192/366 follow-up: 24 months	revascularization by angioplasty or bypass surgery versus angina-guided drug therapy or angina plus ischemia-guided drug therapy	clinically stable patients with angiographically documented coronary disease (50% stenosis in 1 major vessel or branch) suitable for revascularization	Parallel groups open
INSPIRE , 2006 n=104/101 follow-up: 60 months	coronary revascularization for suppressing scintigraphic ischemia versus intensive medical therapy strategy	Stable survivors of MI, total perfusion defect size 20% , ischemic defect size 10% (by adenosine SPECT), EF 35% t	Parallel groups open
SWISSI II , 2007 [NCT00387231] n=96/105 follow-up: 10.2y	Percutaneous coronary intervention aimed at full revascularization versus intensive anti-ischemic drug therapy	patients with a recent MI, silent myocardial ischemia verified by stress imaging, and 1- or 2-vessel coronary artery disease	Parallel groups open Switzerland
MASS , 1995 n=72/72 follow-up: 5y	PTCA versus medical treatment (aspirin, nitrates, beta-blockers and calcium channel blocking	Stable angina, no Q wave MI, no leftventricular dysfunction	Parallel groups open Brazil
Sievers , 1993 n=44/44 follow-up: 2y	PTCA versus medical treatment	Previous nonQ wave MI, no angina indaily life, no previous Q wave MI	Parallel groups open Germany

balloon angioplasty vs CABG

continued...

Trial	Treatments	Patients	Trials design and methods
EAST , 1994 [NCT00000465] n=198/194 follow-up: 3 y	transluminal coronary angioplasty versus coronary-artery bypass grafting	patients with multivessels coronary artery disease	open USA
GABI , 1994 n=182/177 follow-up: 1 y	Percutaneous transluminal coronary angioplasty versus coronary-artery bypass grafting	patients with symptomatic multivessel coronary disease	open Germany
BARI , 1996 [NCT00000462] n=915/914 follow-up: 5.4 y	PTCA versus CABG	Patients with multivessel disease	open USA, Canada
RITA , 1993 n=510/501 follow-up: 2.5 y (6.5y)	percutaneous transluminal coronary angioplasty versus coronary artery bypass surgery	patients with one, two, or three diseased coronary arteries	open UK
ERACI , 1992 n=63/64 follow-up: 3.8 y	Percutaneous transluminal coronary angioplasty versus coronary artery bypass grafting	patients with multivessel disease and lesions suitable for either form of therapy	open Argentina
MASS , 1995 n=72/70 follow-up: 3.2 y	percutaneous transluminal coronaryangioplasty versus mammary bypass surgery	patients with stable angina,normal ventricular function and a proximal stenosis of the leftanterior descending coronary artery >80%	open Brazil
Toulouse , 1992 n=76/76 follow-up: 2.8 y	PTCA versus CABG	patients with multivessels coronary artery disease	open France
Lausanne , 1994 n=68/66 follow-up: 3.2 y	transluminal coronary angioplasty versus Coronary artery bypass grafting	patients with isolated proximal left anterior descending artery stenosis, conserved left ventricular function, and documented ischaemia	open Switzerland
CABRI , 1995 n=541/513 follow-up: 1 y	percutaneous transluminal coronary angioplasty versus coronary artery bypass grafting	patients with symptomatic multivessel coronary disease	open Europe
angioplasty vs MIDCAB			

continued...

Trial	Treatments	Patients	Trials design and methods
AMIST (Reeves) , 2004 n=50/50 follow-up: 12 months	percutaneous transluminal coronary angioplasty (PTCA) with or without stenting versus minimally invasive direct coronary artery bypass grafting (MIDCAB)	single-vessel disease (at least 50% stenosis) of the left anterior descending coronary artery (LAD).	Parallel groups open England

More details and results :

- myocardial revascularization for coronary artery disease in all type of patient at <http://www.trialresultscenter.org/go-Q26>
- myocardial revascularization for coronary artery disease in multivessels disease at <http://www.trialresultscenter.org/go-Q31>
- myocardial revascularization for coronary artery disease in single vessel disease at <http://www.trialresultscenter.org/go-Q32>

References

RITA 2, 1997:

Coronary angioplasty versus medical therapy for angina: the second Randomised Intervention Treatment of Angina (RITA-2) trial. RITA-2 trial participants Lancet 1997;350:461-8 [[9274581](#)]

Henderson RA, Pocock SJ, Clayton TC, Knight R, Fox KA, Julian DG, Chamberlain DA Seven-year outcome in the RITA-2 trial: coronary angioplasty versus medical therapy J Am Coll Cardiol 2003;42:1161-70 [[14522473](#)]

ACME, 1992:

Parisi AF, Folland ED, Hartigan P A comparison of angioplasty with medical therapy in the treatment of single-vessel coronary artery disease. Veterans Affairs ACME Investigators N Engl J Med 1992;326:10-6 [[1345754](#)]

Hartigan PM, Giacomini JC, Folland ED, Parisi AF Two- to three-year follow-up of patients with single-vessel coronary artery disease randomized to PTCA or medical therapy (results of a VA cooperative study). Veterans Affairs Cooperative Studies Program ACME Investigators. Angioplasty Compared to Medicine Am J Cardiol 1998;82:1445-50 [[9874045](#)]

ACME 2 (Folland), 1997:

Folland ED, Hartigan PM, Parisi AF Percutaneous transluminal coronary angioplasty versus medical therapy for stable angina pectoris: outcomes for patients with double-vessel versus single-vessel coronary artery disease in a Veterans Affairs Cooperative randomized trial. Veterans Affairs ACME InvestigatorS J Am Coll Cardiol 1997;29:1505-11 [[9180111](#)]

Henderson RA, Pocock SJ, Clayton TC, Knight R, Fox KA, Julian DG, Chamberlain DA Seven-year outcome in the RITA-2 trial: coronary angioplasty versus medical therapy J Am Coll Cardiol 2003;42:1161-70 [[14522473](#)]

ACIP, 1997:

Davies RF, Goldberg AD, Forman S, Pepine CJ, Knatterud GL, Geller N, Sopko G, Pratt C, Deanfield J, Conti CR Asymptomatic Cardiac Ischemia Pilot (ACIP) study two-year follow-up: outcomes of patients randomized to initial strategies of medical therapy versus revascularization. Circulation 1997;95:2037-43 [[9133513](#)]

INSPIRE, 2006:

Mahmarian JJ, Dakik HA, Filipchuk NG, Shaw LJ, Iskander SS, Ruddy TD, Keng F, Henzlova MJ, Allam A, Moy LA, Pratt CM An initial strategy of intensive medical therapy is comparable to that of coronary revascularization for suppression of scintigraphic ischemia in high-risk but stable survivors of acute myocardial infarction. *J Am Coll Cardiol* 2006;48:2458-67 [[17174182](#)]

SWISSI II, 2007:

Erne P, Schoenenberger AW, Burckhardt D, Zuber M, Kiowski W, Buser PT, Dubach P, Resink TJ, Pfisterer M Effects of percutaneous coronary interventions in silent ischemia after myocardial infarction: the SWISSI II randomized controlled trial. *JAMA* 2007;297:1985-91 [[17488963](#)]

MASS, 1995:

Hueb WA, Bellotti G, de Oliveira SA, Arie S, de Albuquerque CP, Jatene AD, Pileggi F The Medicine, Angioplasty or Surgery Study (MASS): a prospective, randomized trial of medical therapy, balloon angioplasty or bypass surgery for single proximal left anterior descending artery stenoses *J Am Coll Cardiol* 1995;26:1600-5 [[7594092](#)] [10.1016/0735-1097\(95\)00384-3](#)

Sievers, 1993:

Sievers N, Hamm CW, Herzner A, Kuck KH Medical therapy versus PTCA: a prospective, randomized trial in patients with asymptomatic coronary single-vessel disease. Abstract. *Circulation*. 1993;88(suppl I):I-297 [0]

EAST, 1994:

King SB 3rd, Lembo NJ, Weintraub WS, Kosinski AS, Barnhart HX, Kutner MH, Alazraki NP, Guyton RA, Zhao XQ A randomized trial comparing coronary angioplasty with coronary bypass surgery. Emory Angioplasty versus Surgery Trial (EAST) *N Engl J Med* 1994 Oct 20;331:1044-50 [[8090163](#)]

GABI, 1994:

Hamm CW, Reimers J, Ischinger T, Rupprecht HJ, Berger J, Bleifeld W A randomized study of coronary angioplasty compared with bypass surgery in patients with symptomatic multivessel coronary disease. German Angioplasty Bypass Surgery Investigation (GABI) *N Engl J Med* 1994 Oct 20;331:1037-43 [[8090162](#)]

BARI, 1996:

Comparison of coronary bypass surgery with angioplasty in patients with multivessel disease. The Bypass Angioplasty Revascularization Investigation (BARI) Investigators. *N Engl J Med* 1996 Jul 25;335:217-25 [[8657237](#)]

RITA, 1993:

Coronary angioplasty versus coronary artery bypass surgery: the Randomized Intervention Treatment of Angina (RITA) trial. *Lancet* 1993 Mar 6;341:573-80 [[8094826](#)]

ERACI, 1992:

Rodriguez A, Bouillon F, Perez-Balino N, Paviotti C, Liprandi MI, Palacios IF Argentine randomized trial of percutaneous transluminal coronary angioplasty versus coronary artery bypass surgery in multivessel disease (ERACI): in-hospital results and 1-year follow-up. ERACI Group. *J Am Coll Cardiol* 1993 Oct;22:1060-7 [[8409041](#)]

MASS, 1995:

Hueb WA, Bellotti G, de Oliveira SA, Arie S, de Albuquerque CP, Jatene AD, Pileggi F The Medicine, Angioplasty or Surgery Study (MASS): a prospective, randomized trial of medical therapy, balloon angioplasty or bypass surgery for single proximal left anterior descending artery stenoses. *J Am Coll Cardiol* 1995 Dec;26:1600-5 [[7594092](#)]

Toulouse, 1992:

Lausanne, 1994:

Goy JJ, Eeckhout E, Burnand B, Vogt P, Stauffer JC, Hurni M, Stumpe F, Ruchat P, Sadeghi H, Kappenberger L Coronary angioplasty versus left internal mammary artery grafting for isolated proximal left anterior descending artery stenosis. *Lancet* 1994 Jun 11;343:1449-53 [[7911175](#)]

CABRI, 1995:

First-year results of CABRI (Coronary Angioplasty versus Bypass Revascularisation Investigation). CABRI Trial Participants. *Lancet* 1995 Nov 4;346:1179-84 [7475656]

Martuscelli E, Clementi F, Gallagher MM, D'Eliseo A, Chiricolo G, Nigri A, Marino B, Romeo F Revascularization strategy in patients with multivessel disease and a major vessel chronically occluded; data from the CABRI trial. *Eur J Cardiothorac Surg* 2008;33:4-8 [17988889]

AMIST (Reeves), 2004:

Reeves BC, Angelini GD, Bryan AJ, Taylor FC, Cripps T, Spyt TJ, Samani NJ, Roberts JA, Jacklin P, Sehra HK, Culliford LA, Keenan DJ, Rowlands DJ, Clarke B, Stanbridge R, Foale R A multi-centre randomised controlled trial of minimally invasive direct coronary bypass grafting versus percutaneous transluminal coronary angioplasty with stenting for proximal stenosis of the left anterior descending coronary artery. *Health Technol Assess* 2004;8:1-43 [15080865]

Entry terms: streptokinase, PTCA, primary angioplasty, primary ballon angioplasty, primary PTCA