

Table 1: Studies that found an advantage for early percutaneous coronary intervention after thrombolysis versus delayed intervention

Study	n	Study design	Intervention	Comparison group	ILCOR		Clinical endpoints	Other endpoints
					Lo E	D&M		
Califf et al ¹⁹ <i>Circulation</i> 1991;83:1543 TAMI-5 trial	575	RCT	Immediate Cath ± rescue PCI for failed thrombolysis	Cath at 5–10 d after thrombolysis	1	Good	Fewer adverse outcomes (33% v. 45%, $p = 0.004$); no significant difference in transfusion rates	Trend toward higher patency with immediate Cath
Hochman et al ³⁵ <i>N Engl J Med</i> 1999;341:625 SHOCK trial	302	RCT	Emergency PCI/CABG for cardiogenic shock	Conservative noninterventional strategy	1	Good	Survival improved at 6 mo with emergency revascularization (OR 0.80, 95% CI 0.54–0.98)	
Fernandez-Aviles et al ²⁰ <i>Lancet</i> 2004;364:1045 GRACIA-1 trial	500	RCT	PCI (stent) within 24 h of thrombolysis (25% required transfer)	Conservative noninterventional strategy	1	Good	Less revascularization (OR 0.30, 95% CI 0.15–0.62) and trend toward less death/MI at 1 yr (OR 0.59, 95% CI 0.33–1.05)	
Bednar et al ¹⁸ <i>Can J Cardiol</i> 2003;19:1133 PRAGUE study	300	RCT	Group B — thrombolysis during transfer for Cath, PCI (stent)	Group A — thrombolysis without transfer Group C — transfer for primary PCI	2	Good	No significant difference in overall mortality; lower cardiac mortality for early presenters (within 2 h): group A 18%, B 3%, C 8% ($p < 0.05$)	
Topol et al ²² <i>Circulation</i> 1987;75:420 TAMI-1 pilot study	28	RCT	PCI 120 min after tPA	Angiography at 120 min, no PCI	2	Fair	Less recurrent ischemia and reinfarction (7% v. 53%, $p = 0.01$)	Greater improvement in infarct-zone regional LV function
Scheller et al ²¹ <i>J Am Coll Cardiol</i> 2003;42:634 SIAM III study	197	RCT	PCI (stent) 6 h after reteplase	PCI (stent) 2 wk after reteplase	2	Fair	Lower rate of ischemic events (5% v. 28%, $p = 0.001$)	Higher LVEF at 2 wk and 6 mo
Ellis et al ¹⁷ <i>Circulation</i> 1994;90:2280 RESCUE trial	151	RCT	Rescue PCI after failed thrombolysis	Conservative noninterventional strategy	2	Fair	Trend toward less death or severe CHF (6% v. 17%, $p = 0.05$) with rescue PCI	Improvement with rescue PCI in exercise but not resting LVEF
Vermeer et al ²³ <i>Heart</i> 1999;82:426 LIMI trial	224	RCT	tPA + transfer for immediate Cath, rescue PCI if needed	tPA alone, or transfer for primary PCI	2	Fair	No complications during transport No significant differences in outcomes	
Herrmann et al ²⁴ <i>J Am Coll Cardiol</i> 2000;36:1489 SPEED trial	323	NRC	PCI (stent) 90 min after reteplase, abciximab or both	Conservative noninterventional strategy	3	Fair	Less reinfarction (1.2% v. 4.9%, $p = 0.03$) and urgent revascularization (1.6% v. 9.3%, $p = 0.001$)	
Kurihara et al ¹⁴ <i>Am Heart J</i> 2004;147:E14	39	RCT	Monteplase + PCI (stent)	Primary PCI (stent)	7	Good	No significant differences in clinical outcomes, including LVEF	Higher rate of patency pre-PCI with monteplase
Ross et al ²⁶ <i>J Am Coll Cardiol</i> 1999;34:1954 PACT	606	RCT	50 mg tPA before immediate Cath/PCI	Placebo before immediate Cath/PCI	7	Good	No significant difference in adverse outcomes or LV function	Improved IRA patency pre-PCI associated with tPA
Schweiger et al ²⁵ <i>J Am Coll Cardiol</i> 2001;88:831 TIMI 10B + TIMI 14	1938	NRC	PCI (stent) 90 min after thrombolysis	Conservative noninterventional strategy	7	Fair	Lower rate of death/MI in multivariate model (OR 0.46, 95% CI 0.24–0.87)	
Berger et al ³⁶ <i>Circulation</i> 1997;96:122 GUSTO-I	2200	NRC	Early angiography, PCI/CABG for cardiogenic shock	No early angiography for cardiogenic shock	7	Fair	Independently associated with lower 30-d mortality (OR 0.43, 95% CI 0.34–0.54)	

Note: Superscript numbers correspond to the reference list in the main article (*CMAJ* 2005;173(12):1473–81, DOI: 10.1503/cmaj.045278), a review of immediate angioplasty after thrombolysis, which was printed with a less detailed version of this table. The article is also available online (www.cmaj.ca/cgi/content/full/173/12/1473).

CABG = coronary artery bypass graft surgery, Cath = cardiac catheterization, CHF = congestive heart failure, CI = confidence interval, D&M = design and methods, GRACIA = GRupo de Análisis de la Cardiopatía Isquémica Aguda, GUSTO = Global Utilization of Streptokinase and Tissue plasminogen activator for Occluded coronary arteries, ILCOR = International Liaison Committee on Resuscitation, IRA = infarct-related artery, LIMI = Limburg Intervention/Myocardial Infarction, LoE = level of evidence, LV = left-ventricular, LVEF = left-ventricular ejection fraction, MI = myocardial infarction, NRC = nonrandomized comparison, OR = odds ratio, PACT = Plasminogen-activator Angioplasty Compatibility Trial, PCI = percutaneous coronary intervention, PRAGUE = Primary Angioplasty after transport of patients from General community hospitals to cath Units with/without Emergency thrombolysis infusion, RCT = randomized controlled trial, RESCUE = Randomized Evaluation of Salvage angioplasty with Combined Utilization of Endpoints, SHOCK = Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock, SIAM III = Southwest German Interventional study in Acute Myocardial infarction), SPEED = Strategies for Patency Enhancement in the Emergency Department, TAMI = Thrombolysis and Angioplasty in Myocardial Infarction, TIMI = Thrombolysis in Myocardial Infarction, tPA = tissue plasminogen activator.

Table 2: Studies that did not find an advantage for early percutaneous coronary intervention after thrombolysis v. delayed intervention

Study	n	Study design	Intervention	Comparison group	ILCOR		Clinical endpoints	Other endpoints
					Lo E	D&M		
TIMI Research Group ²⁸ <i>JAMA</i> 1988;260:2849 TIMI 2A	389	RCT	Immediate PCI after tPA	Cath or PCI at 18–48 h after tPA	1	Excellent	Increased transfusion and CABG (16% v. 8%; $p = 0.01$)	No difference in LVEF
Rogers et al ⁶ <i>Circulation</i> 1990;81:1457 TIMI 2A	586	RCT	Immediate PCI after tPA	PCI at 18–48 h after tPA, or ischemia-guided PCI	1	Excellent	No improvement in mortality Increased rates of transfusion, CABG	No difference in LVEF
Simoons et al ²⁷ <i>Lancet</i> 1988;1:197 ECSG rTPA trial	367	RCT	Immediate PCI after tPA	Conservative noninterventional strategy	1	Excellent	Trend toward higher mortality at 14 d (7% v. 3%; $p = 0.08$)	No difference in infarct size or LVEF
Michels and Yusuf ³³ <i>Circulation</i> 1995;91:476	2243	Meta-analysis	Immediate PCI after thrombolysis	Delayed PCI or no PCI after thrombolysis	1	Excellent	No difference in death/reinfarction at 6 wk and 1 yr (OR 1.38, 95% CI 0.81–2.34)	
Topol et al ²⁹ <i>N Engl J Med</i> 1987;317:581 TAMI-1 trial	197	RCT	Transfer for Cath 90 min after tPA, immediate PCI	Transfer for Cath 90 min after tPA, elective PCI at 7–10 d	1	Good	No difference in death, reocclusion	No difference in regional LV wall motion
Jovell et al ³² <i>Online J Curr Clin Trials</i> 1993; doc no 67, PMID: 8306009	5882	Meta-analysis	Early PCI after thrombolysis	Conservative noninterventional strategy	1	Good	No difference in rates of mortality or reinfarction	
Topol ³⁴ <i>Ann Intern Med</i> 1988;109:970	1142	Syst OV of 3 trials	Immediate PCI after thrombolysis	See Topol ²⁹ , Simoons ²⁷ and TIMI Research ²⁸	1	Good	No improvement in mortality Increased rates of transfusion, CABG	No improvement in LVEF
Arnold et al ⁷ <i>J Am Coll Cardiol</i> 1991;17:11 ECSG rTPA trial	291	RCT	Immediate PCI after tPA	Conservative noninterventional strategy	2	Good		No difference in regional LV wall motion
Arnold et al ⁸ <i>Circulation</i> 1992;86:111 ECSG rTPA trial	367	RCT	Immediate PCI after tPA	Conservative noninterventional strategy	2	Good	Trend toward increased mortality at 1 yr (9% v. 5%; $p = 0.16$)	
De Bono ⁴ <i>J Am Coll Cardiol</i> 1988;12(Suppl A):20A ECSG rTPA trial	367	RCT	Immediate PCI after tPA	Conservative noninterventional strategy	2	Good	Trend toward increased mortality at 3 mo	No difference in LVEF, infarct size or coronary patency
Widimsky et al ³⁰ <i>Eur Heart J</i> 2000;21:823 PRAGUE study	300	RCT	Group B: thrombolysis during transfer for Cath, PCI (stent)	Group A: thrombolysis without transfer Group C: transfer for primary PCI	2	Good	Rates of death, reinfarction and stroke similar to those in group A, higher than those in group C	
Erbel et al ⁵ <i>J Am Coll Cardiol</i> 1989;14:276	206	RCT	PCI after IV + subcutaneous streptokinase	Conservative noninterventional strategy	3	Fair	No difference in mortality at 3 yr	No improvement in LV function
Ellis et al ⁹ <i>Coron Artery Dis</i> 1994;5:611 TAMI-1 analysis	108	RCT	Immediate PCI after thrombolysis with TIMI 2 flow	Conservative noninterventional strategy	7	Fair	No difference in rates of death or congestive heart failure	Slightly better LVEF improvement with early PCI
O'Neill et al ³¹ <i>Circulation</i> 1992;86:1710	122	RCT	Streptokinase, then immediate PCI	Primary PCI	7	Fair	Higher rates of transfusion, emergency CABG (10% v. 1.6%; $p = 0.03$)	No difference in LVEF or patency
Sutton et al ³⁸ <i>J Am Coll Cardiol</i> 2004;44:287 MERLIN study	307	RCT	Rescue PCI after failed thrombolysis	Conservative noninterventional strategy	2	Good	Higher rates of transfusion (11% v. 1%; $p < 0.001$) and stroke (5% v. 1%; $p = 0.03$) No difference in mortality at 30 d	No difference in regional LV wall motion at 30 d
Kastrati et al ⁴⁰ <i>JAMA</i> 2004;291:947 BRAVE trial	253	RCT	Half-dose reteplase + abciximab, then transfer for immediate PCI	Abciximab, then transfer for immediate PCI	7	Good	No differences in death, reinfarction or stroke rates; trend toward increased bleeding with reteplase (6% v. 2%; $p = 0.16$)	No difference in SPECT infarct size at 5–10 d

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BRAVE = Bavarian Reperfusion Alternatives Evaluation, CABG = coronary artery bypass graft surgery, Cath = cardiac catheterization, CI = confidence interval, D&M = design and methods, ECSG rTPA = European Cooperative Study Group for Recombinant Tissue-Type Plasminogen Activator, ILCOR = International Liaison Committee on Resuscitation, IV = Intravenous, LoE = level of evidence, LV = left-ventricular, LVEF = left-ventricular ejection fraction, MERLIN = Middlesbrough Early Revascularisation for the Limitation of Infarction, OR = odds ratio, PCI = percutaneous coronary intervention, PRAGUE = Primary Angioplasty after transport of patients from General community hospitals to cath Units with/without Emergency thrombolysis infusion, RCT = randomized controlled trial, SPECT = single-photon emission computed tomography, Syst OV = systematic overview, TAMI = Thrombolysis and Angioplasty in Myocardial Infarction, TIMI = Thrombolysis in Myocardial Infarction, tPA = tissue plasminogen activator.