

# Clinical trials of captopril

TrialResults-center [www.trialresultscenter.org](http://www.trialresultscenter.org)

## 1 acute myocardial infarction

Trial	Treatments	Patients	Trials design and methods
<b>captopril vs placebo</b>			
<b>Bussmann , 1992</b> n=22/24 follow-up: 48h	slow intravenous bolus injection of 2.5 or 5.0 mg captopril followed by a continuous infusion of 1.5-2.0 mg/h for a period of 48 hours versus placebo	patients with acute myocardial infarction	Parallel groups double blind
<b>SAVE , 1992</b> n=1115/1116 follow-up: 3.5y	Captopril 125 mg initial dose, up to 2550 mg three times daily versus placebo	patient within 316 days of a MI, LVEF <40%	Parallel groups double blind
<b>CATS , 1996</b> n=149/149 follow-up: 1 year	captopril 25 mg three times a day versus placebo	patients with a first anterior myocardial infarction treated with intravenous streptokinase within 6h of onset of symptoms	Parallel groups double blind The Netherlands
<b>CCS-1 , 1995</b> n=13634 follow-up: 1 month	captopril 6.25 mg initial dose, 12.5 mg 2 h later, and then 12.5 mg three times daily for 28 days versus placebo	Acute MI <36h of MI	Parallel groups double blind China
<b>Di Pasquale , 1997</b> n=31/30 follow-up: 12h	captopril first dose 2-4 h after starting thrombolysis (the dose was then increased up to 25 mg every 8 h) versus placebo	patients hospitalized for suspected anterior AMI within 4 h from the onset of symptoms suitable for thrombolysis	Parallel groups double blind italy
<b>Pfeffer , 1988</b> n=38 follow-up: 1 year	Captopril versus placebo	patient within 11-31 days after MI, LVEF ≤45% , not in overt congestive heart failure	Parallel groups double blind
<b>Di Pasquale , 1994</b> n=188/183 follow-up: 2h	captopril, 6.25 mg, orally 15 min before thrombolysis versus placebo before thrombolysis	patients with acute myocardial infarction , hospitalized within 4 h of the onset of symptoms	Parallel groups double blind Italy

continued...

<b>Trial</b>	<b>Treatments</b>	<b>Patients</b>	<b>Trials design and methods</b>
<b>Sogaard , 1994</b> n=58 follow-up: 6 months	Captopril 50mg daily versus placebo	patients with left ventricular (LV) dysfunction on day 7 after MI	Parallel groups double blind
<b>ECCE , 1997</b> n=104/104 follow-up: 1 month	captopril titrated dose in order to preserve their blood pressure versus placebo	patients with acute myocardial infarction	Parallel groups double blind
<b>Sharpe , 1988</b> n=60 follow-up: 1 year	Captopril 25 mg thrice a day versus placebo	patients with symptomless left ventricular dysfunction (LVEF<45% ) 1 week after a myocardial infarction without clinical evidence of heart failure	Parallel groups double blind
<b>Mortarino , 1990</b> n=10/11 follow-up: 2 months	Captopril 25 mg bid versus placebo	patient with mild congestive heart failure after recent MI	Parallel groups double blind
<b>French , 1999</b> n=243/250 follow-up: 1 year	captopril 6.25 mg, increasing to 50 mg t.d.s. versus placebo	patients aged <or = 75 years with first infarctions, presenting within 4 h of symptom onset	Parallel groups double blind New Zealand
<b>Galcera , 1993</b> n=21/22 follow-up: 14 days	captopril versus placebo	patients with a first acute myocardial infarction and a pulmonary capillary pressure equal or above 17 mmHg	Parallel groups double blind
<b>Hargreaves , 1992</b> n=36/36 follow-up: 28 days	12.5 mg of captopril three times daily versus placebo	patients with acute myocardial infarction (systolic blood pressure >90 mm Hg) within 24 hours of the start of pain	Parallel groups double blind UK
<b>ISIS-4 , 1995</b> n=29028/29022 follow-up: 1 month	captopril 6.25mg twice daily initially titrated up to 50 mg twice daily (for 1 month) versus placebo	Acute MI <24h of MI, no cardiogenic shock or persistent severe hypotension	Factorial plan double blind 31 countries
<b>Nabel , 1991</b> n=20/18 follow-up: 3 months	intravenous followed by oral captopril versus placebo	patients with myocardial infarction	Parallel groups double blind
<b>Ray , 1993</b> n=99 follow-up: 1 year	captopril 25 mg three times a day versus placebo	haemodynamically stable patients with acute myocardial infarction, selected on clinical grounds as being at risk of late ventricular dilatation	Parallel groups double blind Glasgow
<b>Sharpe , 1991</b> n=100 follow-up: 3 months	captopril 50 mg twice daily versus placebo	patients with Q wave myocardial infarction, but without clinical heart failure 24-48h after onset of symptoms	Parallel groups double blind

continued...

Trial	Treatments	Patients	Trials design and methods
<b>captopril or enalapril vs placebo</b>			
<b>PRACTICAL (captopril) , 1994</b> n=150/75 follow-up: 1 year	captopril 25 mg three times daily or enalapril 5 mg three times daily versus placebo	patients with acute myocardial infarction within 24 hours of onset	Parallel groups double blind

More details and results :

- angiotensin-Converting Enzyme Inhibitors for acute myocardial infarction in systematic early treatment (with or without sign of HF) at <http://www.trialresultscenter.org/go-Q145>
- angiotensin-Converting Enzyme Inhibitors for acute myocardial infarction in patients with or without HF at <http://www.trialresultscenter.org/go-Q146>
- angiotensin-Converting Enzyme Inhibitors for acute myocardial infarction in patients with left ventricular dysfunction after MI at <http://www.trialresultscenter.org/go-Q147>

## References

### Bussmann, 1992:

Bussmann WD, Micke G, Hildenbrand R, Klepzig H Jr [Captopril in acute myocardial infarct: its effect on infarct size and arrhythmias] Dtsch Med Wochenschr 1992;117:651-7 [[1572248](#)]

### SAVE, 1992:

Pfeffer MA, Braunwald E, Moye LA, Basta L, Brown EJ Jr, Cuddy TE, Davis BR, Geltman EM, Goldman S, Flaker GC Effect of captopril on mortality and morbidity in patients with left ventricular dysfunction after myocardial infarction. Results of the survival and ventricular enlargement trial. The SAVE Investigators. N Engl J Med 1992 Sep 3;327:669-77 [[1386652](#)]

### CATS, 1996:

van Gilst WH, Kingma JH, Peels KH, Dambrink JH, St John Sutton M Which patient benefits from early angiotensin-converting enzyme inhibition after myocardial infarction? Results of one-year serial echocardiographic follow-up from the Captopril and Thrombolysis Study (CATS). J Am Coll Cardiol 1996;28:114-21 [[8752803](#)]

### CCS-1, 1995:

Oral captopril versus placebo among 13,634 patients with suspected acute myocardial infarction: interim report from the Chinese Cardiac Study (CCS-1) Lancet 1995 Mar 18;345:686-7 [[7885123](#)]

### Di Pasquale, 1997:

Di Pasquale P, Bucca V, Scalzo S, Cannizzaro S, Longo AM, Alessi V, D'Amato M, Manusia F, Magatti MF [Is the reduction of the plasma levels of endothelin in the acute and sub-acute stage of myocardial infarct one of the beneficial effects of early treatment with ace inhibitors?] G Ital Cardiol 1996;26:673-80 [[8803588](#)]

Di Pasquale P, Valdes L, Albano V, Bucca V, Scalzo S, Pieri D, Maringhini G, Paterna S Early captopril treatment reduces plasma endothelin concentrations in the acute and subacute phases of myocardial infarction: a pilot study. J Cardiovasc Pharmacol 1997;29:202-8 [[9057069](#)]

Di Pasquale P, Bucca V, Scalzo S, Cannizzaro S, Longo AM, Alessi V, D'Amato M, Manusia F, Magatti MF [Is the reduction of the plasma levels of endothelin in the acute and sub-acute stage of myocardial infarct one of the beneficial effects of early treatment with ace inhibitors?] *G Ital Cardiol* 1996;26:673-80 [8803588]

**Pfeffer, 1988:**

Pfeffer MA, Lamas GA, Vaughan DE, Parisi AF, Braunwald E Effect of captopril on progressive ventricular dilatation after anterior myocardial infarction. *N Engl J Med* 1988;319:80-6 [2967917]

**Di Pasquale, 1994:**

Di Pasquale P, Paterna S, Bucca V, Maringhini G, Magatti M Effects of the administration of captopril, metoprolol and of the captopril-metoprolol combination as adjuvant therapy during thrombolysis in acute myocardial infarction. *Int J Cardiol* 1994;46:107-12 [7814158]

Di Pasquale P, Paterna S, Cannizzaro S, Bucca V Does captopril treatment before thrombolysis in acute myocardial infarction attenuate reperfusion damage? Short-term and long-term effects. *Int J Cardiol* 1994;43:43-50 [8175218]

Di Pasquale P, Paterna S, Parrinello G, Bucca V, Cannizzaro S, Pipitone F, Maringhini G, Scalzo S, Licata G Captopril does not affect plasma endothelin-1 during thrombolysis and reperfusion. *Int J Cardiol* 1995;51:131-5 [8522408]

**Sogaard, 1994:**

Sgaard P, Gtzsche CO, Ravkilde J, Nrgaard A, Thygesen K Ventricular arrhythmias in the acute and chronic phases after acute myocardial infarction. Effect of intervention with captopril. *Circulation* 1994;90:101-7 [8025983]

**ECCE, 1997:**

Kleber FX, Sabin GV, Winter UJ, Reindl I, Beil S, Wenzel M, Fischer M, Doering W Angiotensin-converting enzyme inhibitors in preventing remodeling and development of heart failure after acute myocardial infarction: results of the German multicenter study of the effects of captopril on cardiopulmonary exercise parameters (ECCE). *Am J Cardiol* 1997;80:162A-167A [9293972]

**Sharpe, 1988:**

Sharpe N, Murphy J, Smith H, Hannan S Treatment of patients with symptomless left ventricular dysfunction after myocardial infarction. *Lancet* 1988;1:255-9 [2893080]

**Mortarino, 1990:**

Mortarino G, Ghiringhelli S, Onofri M, Trudu A, Corda G, Lepori G Mechanocardiographic effects of ACE-inhibitors. *Acta Cardiol* 1990;45:537-46 [2073001]

**French, 1999:**

French JK, Amos DJ, Williams BF, Cross DB, Elliott JM, Hart HH, Williams MG, Norris RM, Ashton NG, Whitlock RM, McLaughlin SC, White HD Effects of early captopril administration after thrombolysis on regional wall motion in relation to infarct artery blood flow. *J Am Coll Cardiol* 1999;33:139-45 [9935020]

**Galcera, 1993:**

Galcera-Tomas J, Nuo de la Rosa JA, Torres-Martinez G, Rodriguez-Garcia P, Castillo-Soria FJ, Canton-Martinez A, Campos-Peris JV, Pico-Aracil F, Ruiz-Ros JA, Ruiperez-Abizanda JA Effects of early use of captopril on haemodynamics and short-term ventricular remodelling in acute anterior myocardial infarction. *Eur Heart J* 1993;14:259-66 [8449203]

**Hargreaves, 1992:**

Hargreaves AD, Kolettis T, Jacob AJ, Flint LL, Turnbull LW, Muir AL, Boon NA Early vasodilator treatment in myocardial infarction: appropriate for the majority or minority? *Br Heart J* 1992;68:369-73 [1449918]

**ISIS-4, 1995:**

ISIS-4: a randomised factorial trial assessing early oral captopril, oral mononitrate, and intravenous magnesium sulphate in 58,050 patients with suspected acute myocardial infarction. ISIS-4 (Fourth International Study of Infarct Survival) Collaborative Group. Lancet 1995 Mar 18;345:669-85 [7661937]

**Nabel, 1991:**

Nabel EG, Topol EJ, Galeana A, Ellis SG, Bates ER, Werns SW, Walton JA, Muller DW, Schwaiger M, Pitt B A randomized placebo-controlled trial of combined early intravenous captopril and recombinant tissue-type plasminogen activator therapy in acute myocardial infarction. J Am Coll Cardiol 1991;17:467-73 [1825097]

**Ray, 1993:**

Ray SG, Pye M, Oldroyd KG, Christie J, Connelly DT, Northridge DB, Ford I, Morton JJ, Dargie HJ, Cobbe SM Early treatment with captopril after acute myocardial infarction. Br Heart J 1993;69:215-22 [8461219]

**Sharpe, 1991:**

Sharpe N, Smith H, Murphy J, Greaves S, Hart H, Gamble G Early prevention of left ventricular dysfunction after myocardial infarction with angiotensin-converting-enzyme inhibition. Lancet 1991;337:872-6 [1672967]

**PRACTICAL (captopril), 1994:**

Foy SG, Crozier IG, Turner JG, Richards AM, Frampton CM, Nicholls MG, Ikram H Comparison of enalapril versus captopril on left ventricular function and survival three months after acute myocardial infarction (the "PRACTICAL" study). Am J Cardiol 1994;73:1180-6 [8203335]

## 2 hypertension

CT

Trial	Treatments	Patients	Trials design and methods
<b>captopril or atenolol vs control</b>			
UKPDS 38 , 1998 n=758/390 follow-up: 8.4y (median)	tight control of blood pressure aiming at a BP <150/85 (with the use of captopril or atenolol as main treatment, other treatment were added if the control criteria were not met) versus less tight control aiming at a blood pressure of <180/105 (avoiding treatment with ACE inhibitors or beta-blockers)	hypertensive patients with type 2 diabetes	Parallel groups open UK
<b>captopril vs atenolol</b>			
UKPDS 39 , 1998 n=400/358 follow-up: ND	captopril 25 mg/d aiming at a BP <150/85 versus atenolol 50mg/d aiming at a BP <150/85	hypertensive patients with type 2 diabetes	Parallel groups open UK
<b>Valsartan + captopril vs Captopril</b>			
VALIANT/Val+Cap , 2003 n=4885/4909 follow-up: 2.1 y	Valsartan + captopril versus Captopril	patients with myocardial infarction complicated by left ventricular systolic dysfunction, heart failure, or both	Parallel groups double-blind

continued...

Trial	Treatments	Patients	Trials design and methods
<b>captopril vs diuretic and/or beta-blockers</b>			
<b>CAPP (diabetic subgroup) , 1999</b> n=309/263 follow-up: 6.1 year	Captopril initial dose of 50 mg daily given in one or two doses versus thiazide diuretic or beta-blocker	Patients aged 25-66 years with a measured diastolic blood pressure of 100 mm Hg or more on two occasions; subgroup of diabetic patients	Parallel groups open with blinded assessment Sweden, Finland
<b>captopril vs diuretic or beta-blocker</b>			
<b>CAPPP , 1999</b> n=5492/5493 follow-up: 6.1 y	captopril 50mg/d versus beta-blocker (not specified) or diuretic (not specified)	Patients aged 2566 years with a measured diastolic bloodpressure of 100 mm Hg or more on two occasions	Parallel groups Open Sweden and Finland
<b>UKPDS-HDS , 1998</b> n=400/358 follow-up: 84 y	captopril started at 25mg twice daily up to 50 mg twice dialy (target blood pressure of <150/<85 mmHG) versus atenolol started at 50mg daily up to 100mg if required(target blood pressure of <150/<85 mmHG)	HBP+DM	Parallel groups Open England, Scotland, and Northern Ireland

More details and results :

- anti hypertensive agents for hypertension in diabetic patients at <http://www.trialresultscenter.org/go-Q10>
- anti hypertensive agents for hypertension in all type of patient at <http://www.trialresultscenter.org/go-Q13>
- angiotensin-receptor blockers for hypertension in all diseases requiring ACEi (HF, CHD, HT,...) at <http://www.trialresultscenter.org/go-Q125>

## References

### UKPDS 38, 1998:

Efficacy of atenolol and captopril in reducing risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 39. UK Prospective Diabetes Study Group. BMJ 1998;317:713-20 [9732338]

Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. UK Prospective Diabetes Study Group. BMJ 1998;317:703-13 [9732337]

### UKPDS 39, 1998:

Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. UK Prospective Diabetes Study Group. BMJ 1998;317:703-13 [9732337]

Efficacy of atenolol and captopril in reducing risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 39. UK Prospective Diabetes Study Group. BMJ 1998;317:713-20 [9732338]

### VALIANT/Val+Cap, 2003:

Pfeffer MA, McMurray JJ, Velazquez EJ, Rouleau JL, Kber L, Maggioni AP, Solomon SD, Swedberg K, Van de Werf F, White H, Leimberger JD, Henis M, Edwards S, Zelenkofske S, Sellers MA, Califf RM Valsartan, captopril, or both in myocardial infarction complicated by heart failure, left ventricular dysfunction, or both. N Engl J Med 2003;349:1893-906 [14610160]

McMurray J, Solomon S, Pieper K, Reed S, Rouleau J, Velazquez E, White H, Howlett J, Swedberg K, Maggioni A, Kber L, Van de Werf F, Califf R, Pfeffer M The effect of valsartan, captopril, or both on atherosclerotic events after acute myocardial infarction: an analysis of the Valsartan in Acute Myocardial Infarction Trial (VALIANT). J Am Coll Cardiol 2006;47:726-33 [16487836]

### CAPP (diabetic subgroup), 1999:

Hansson L, Lindholm LH, Niskanen L, Lanke J, Hedner T, Niklason A, Luomanmki K, Dahlf B, de Faire U, Mrlin C, Karlberg BE, Wester PO, Bjrcck JE Effect of angiotensin-converting-enzyme inhibition compared with conventional therapy on cardiovascular morbidity and mortality in hypertension: the Captopril Prevention Project (CAPPP) randomised trial. Lancet 1999;353:611-6 [10030325]

Niklason A, Hedner T, Niskanen L, Lanke J Development of diabetes is retarded by ACE inhibition in hypertensive patients—a subanalysis of the Captopril Prevention Project (CAPPP). J Hypertens 2004;22:645-52 [15076172]

Niskanen L, Hedner T, Hansson L, Lanke J, Niklason A Reduced cardiovascular morbidity and mortality in hypertensive diabetic patients on first-line therapy with an ACE inhibitor compared with a diuretic/beta-blocker-based treatment regimen: a subanalysis of the Captopril Prevention Project. Diabetes Care 2001;24:2091-6 [11723089]

### CAPPP, 1999:

Hansson L, Lindholm LH, Niskanen L, Lanke J, Hedner T, Niklason A, Luomanmaki K, Dahlof B, de Faire U, Morlin C, Karlberg BE, Wester PO, Bjorck JE Effect of angiotensin-converting-enzyme inhibition compared with conventional therapy on cardiovascular morbidity and mortality in hypertension: the Captopril Prevention Project (CAPPP) randomised trial. Lancet 1999 Feb 20;353:611-6 [10030325]

### UKPDS-HDS, 1998:

Efficacy of atenolol and captopril in reducing risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 39. UK Prospective Diabetes Study Group. BMJ 1998 Sep 12;317:713-20 [9732338]

Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. UK Prospective Diabetes Study Group. BMJ 1998 Sep 12;317:703-13 [9732337]

## 3 heart failure

Trial	Treatments	Patients	Trials design and methods
<b>SAVE , 1992</b> n=1115/1116 follow-up: 3.5y	Captopril 125 mg initial dose, up to 2550 mg three times daily versus placebo	patient within 316 days of a MI, LVEF <40%	Parallel groups double blind

continued...

<b>Trial</b>	<b>Treatments</b>	<b>Patients</b>	<b>Trials design and methods</b>
Barabino , 1991 n=52/49 follow-up: 6 months	captopril (37.5-75 mg/day) versus placebo	old patients (>75y) under treatment with digitalis and/or diuretics	double blind
Pfeffer , 1988 n=38 follow-up: 1 year	Captopril versus placebo	patient within 11-31 days after MI, LVEF<=45% , not in overt congestive heart failure	Parallel groups double blind
Bussmann , 1987 n=12/11 follow-up: 6 months	captopril versus placebo	patients with severe heart failure (NYHA classes III and IV) on treatment with digitalis and diuretics	Parallel groups double blind
Sogaard , 1994 n=58 follow-up: 6 months	Captopril 50mg daily versus placebo	patients with left ventricular (LV) dysfunction on day 7 after MI	Parallel groups double blind
Captopril Digoxin Multicenter Research Group , 1988 n=104/100 follow-up:	captopril versus placebo	patients with mild to moderate heart failure	double blind
Sharpe , 1988 n=60 follow-up: 1 year	Captopril 25 mg thrice a day versus placebo	patients with symptomless left ventricular dysfunction (LVEF<45% ) 1 week after a myocardial infarction without clinical evidence of heart failure	Parallel groups double blind
Mortarino , 1990 n=10/11 follow-up: 2 months	Captopril 25 mg bid versus placebo	patient with mild congestive heart failure after recent MI	Parallel groups double blind
Cilazapril-Captopril Multi-centre Group (capt vs pbo) , 1995 n=108/114 follow-up: 12 weeks	cilazapril 1-2.5 mg once daily versus placebo	patients with chronic heart failure (New York Heart Association classes II-IV)	Parallel groups double blind
CMRG , 1983 n=50/42 follow-up: 12 weeks	captopril versus placebo	patients with heart failure refractory to digitalis and diuretic therapy	double blind
Magnani , 1986 n=48/46 follow-up: 1 year	captopril 25 mg t.i.d. versus placebo	patients on digitalis treatment for chronic congestive heart failure (NYHA class II-III)	double blind
Magnani , 1990 n=16/16 follow-up:	captopril versus placebo	patients with congestive heart failure	Cross over double blind

continued...



Trial	Treatments	Patients	Trials design and methods
Munich MHFT (Kleber) , 1992 n=83/87 follow-up: 2.7y (median)	captopril 25 mg twice a day versus placebo	patients with congestive heart failure New York Heart Association (NYHA) functional class I-III on standard treatment	Parallel groups Double blind Germany
<b>spironolactone+captopril vs captopril</b>			
Han , 1994 n=19/16 follow-up: 4 weeks	captopril plus spironolactone versus captopril alone	patients with refractory CHF and New York Heart Association functional class IV without renal dysfunction, hypotension and hyperkalemia	open China
<b>captopril vs enalapril</b>			
packer , 1986 n=21/21 follow-up: 1-3 months	captopril 150 mg/d versus enalapril 40mg/d	patient with severe chronic heart failure	Parallel groups open

More details and results :

- angiotensin-Converting Enzyme Inhibitors for heart failure in all type of heart failure at <http://www.trialresultscenter.org/go-Q43>
- angiotensin-Converting Enzyme Inhibitors for heart failure in elderly at <http://www.trialresultscenter.org/go-Q71>
- diuretics for heart failure in all type of patients at <http://www.trialresultscenter.org/go-Q75>
- angiotensin-Converting Enzyme Inhibitors for heart failure in MI patients with LV dysfunction without clinical evidence of HF at <http://www.trialresultscenter.org/go-Q238>
- aldosterone blockade for heart failure in all type of patients at <http://www.trialresultscenter.org/go-Q488>

## References

### SAVE, 1992:

Pfeffer MA, Braunwald E, Moye LA, Basta L, Brown EJ Jr, Cuddy TE, Davis BR, Geltman EM, Goldman S, Flaker GC Effect of captopril on mortality and morbidity in patients with left ventricular dysfunction after myocardial infarction. Results of the survival and ventricular enlargement trial. The SAVE Investigators. N Engl J Med 1992 Sep 3;327:669-77 [1386652]

### Barabino, 1991:

Barabino A, Galbariggi G, Pizzorni C, Lotti G Comparative effects of long-term therapy with captopril and ibopamine in chronic congestive heart failure in old patients. Cardiology 1991;78:243-56 [1868502]

### Pfeffer, 1988:

Pfeffer MA, Lamas GA, Vaughan DE, Parisi AF, Braunwald E Effect of captopril on progressive ventricular dilatation after anterior myocardial infarction. N Engl J Med 1988;319:80-6 [2967917]

**Bussmann, 1987:**

Bussmann WD, Strger H, Hadler D, Reifart N, Fassbinder W, Jungmann E, Kaltenbach M Long-term treatment of severe chronic heart failure with captopril: a double-blind, randomized, placebo-controlled, long-term study. *J Cardiovasc Pharmacol* 1987;9 Suppl 2:S50-60 [2441202]

**Sogaard, 1994:**

Sgaard P, Gtzsche CO, Ravkilde J, Nrgaard A, Thygesen K Ventricular arrhythmias in the acute and chronic phases after acute myocardial infarction. Effect of intervention with captopril. *Circulation* 1994;90:101-7 [8025983]

**Captopril Digoxin Multicenter Research Group, 1988:**

Comparative effects of therapy with captopril and digoxin in patients with mild to moderate heart failure. The Captopril-Digoxin Multicenter Research Group. *JAMA* 1988 Jan 22-29;259:539-44 [2447297]

**Sharpe, 1988:**

Sharpe N, Murphy J, Smith H, Hannan S Treatment of patients with symptomless left ventricular dysfunction after myocardial infarction. *Lancet* 1988;1:255-9 [2893080]

**Mortarino, 1990:**

Mortarino G, Ghiringhelli S, Onofri M, Trudu A, Corda G, Lepori G Mechanocardiographic effects of ACE-inhibitors. *Acta Cardiol* 1990;45:537-46 [2073001]

**Cilazapril-Captopril Multi-centre Group (capt vs pbo), 1995:**

Comparison of the effects of cilazapril and captopril versus placebo on exercise testing in chronic heart failure patients: a double-blind, randomized, multicenter trial. The Cilazapril-Captopril Multicenter Group. *Cardiology* 1995;86 Suppl 1:34-40 [7614505]

**CMRG, 1983:**

A placebo-controlled trial of captopril in refractory chronic congestive heart failure. Captopril Multicenter Research Group. *J Am Coll Cardiol* 1983;2:755-63 [6350401]

**Magnani, 1986:**

Magnani B, Magelli C Captopril in mild heart failure: preliminary observations of a long-term, double-blind, placebo-controlled multicentre trial. *Postgrad Med J* 1986;62 Suppl 1:153-8 [3534852]

**Magnani, 1990:**

Borgi C, Magelli C, Costa FV, Magnani B, Ambrosioni E Captopril improves hemodynamic response to static exercise in patients with congestive heart failure: a double-blind, placebo-controlled, randomized trial. *Clin Cardiol* 1990;13:329-34 [2189613]

**Munich MHFT (Kleber), 1992:**

Kleber FX, Niemller L, Doering W Impact of converting enzyme inhibition on progression of chronic heart failure: results of the Munich Mild Heart Failure Trial *Br Heart J* 1992;67:289-96 [1389702]

**Han, 1994:**

Han YL, Tong M, Jing QM, Hu XL, Liu JQ, Combined therapy of captopril and spironolactone for refractory congestive heart failure. *Chin Med J (Engl)* 1994;107:688-92. [7805462]

**packer, 1986:**

Packer M, Lee WH, Yushak M, Medina N Comparison of captopril and enalapril in patients with severe chronic heart failure. *N Engl J Med* 1986 Oct 2;315:847-53 [3018566]

## 4 diabetes type 2

Trial	Treatments	Patients	Trials design and methods
<b>captopril or atenolol vs control</b>			
UKPDS 38 , 1998 n=758/390 follow-up: 8.4y (median)	tight control of blood pressure aiming at a BP <150/85 (with the use of captopril or atenolol as main treatment, other treatment were added if the control criteria were not met) versus less tight control aiming at a blood pressure of <180/105 (avoiding treatment with ACE inhibitors or beta-blockers)	hypertensive patients with type 2 diabetes	Parallel groups open UK
<b>captopril vs atenolol</b>			
UKPDS 39 , 1998 n=400/358 follow-up: ND	captopril 25 mg/d aiming at a BP <150/85 versus atenolol 50mg/d aiming at a BP <150/85	hypertensive patients with type 2 diabetes	Parallel groups open UK
<b>captopril vs diuretic and/or beta-blockers</b>			
CAPP (diabetic subgroup) , 1999 n=309/263 follow-up: 6.1 year	Captopril initial dose of 50 mg daily given in one or two doses versus thiazide diuretic or beta-blocker	Patients aged 25-66 years with a measured diastolic blood pressure of 100 mm Hg or more on two occasions; subgroup of diabetic patients	Parallel groups open with blinded assessment Sweden, Finland

11

More details and results :

- anti hypertensive agents for diabetes type 2 in patients with hypertension at <http://www.trialresultscenter.org/go-Q83>
- anti hypertensive agents for diabetes type 2 in patients with or without hypertension at <http://www.trialresultscenter.org/go-Q414>
- angiotensin renin system blockade for diabetes type 2 in all type of patients at <http://www.trialresultscenter.org/go-Q438>

## References

### UKPDS 38, 1998:

Efficacy of atenolol and captopril in reducing risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 39. UK Prospective Diabetes Study Group. BMJ 1998;317:713-20 [9732338]

Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. UK Prospective Diabetes Study Group. BMJ 1998;317:703-13 [9732337]

### UKPDS 39, 1998:

Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. UK Prospective Diabetes Study Group. *BMJ* 1998;317:703-13 [[9732337](#)]

Efficacy of atenolol and captopril in reducing risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 39. UK Prospective Diabetes Study Group. *BMJ* 1998;317:713-20 [[9732338](#)]

**CAPP (diabetic subgroup), 1999:**

Hansson L, Lindholm LH, Niskanen L, Lanke J, Hedner T, Niklason A, Luomanmki K, Dahlf B, de Faire U, Mrlin C, Karlberg BE, Wester PO, Björck JE Effect of angiotensin-converting-enzyme inhibition compared with conventional therapy on cardiovascular morbidity and mortality in hypertension: the Captopril Prevention Project (CAPPP) randomised trial. *Lancet* 1999;353:611-6 [[10030325](#)]

Niklason A, Hedner T, Niskanen L, Lanke J Development of diabetes is retarded by ACE inhibition in hypertensive patients—a subanalysis of the Captopril Prevention Project (CAPPP). *J Hypertens* 2004;22:645-52 [[15076172](#)]

Niskanen L, Hedner T, Hansson L, Lanke J, Niklason A Reduced cardiovascular morbidity and mortality in hypertensive diabetic patients on first-line therapy with an ACE inhibitor compared with a diuretic/beta-blocker-based treatment regimen: a subanalysis of the Captopril Prevention Project. *Diabetes Care* 2001;24:2091-6 [[11723089](#)]

Entry terms: spironolactone, Veroshpiron, Verospirone, Spiractin, Spirobeta, Spirogamma, Spirolang, Spirono-Isis, Spirono Isis, Spironone, Spirospare, Verospiron, Aldactone, Aldactone A, Aquareduct, duraspiron, Espironolactona Alter, Espironolactona Mundogen, Flumach, Fru-mikal, Jenaspiron, Novo-Spiroton, Novo Spiroton, NovoSpiroton, Practon, Spiro L.U.T., spiro von ct, , SQ-14534, SQ 14534, SQ14534, SQ-14225, SQ 14225, SQ14225, Capoten, Lopirin,