

# Clinical trials of enalapril

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## 1 acute myocardial infarction

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
<b>enalapril vs placebo</b>			
<b>CONSENSUS 2 , 1992</b> n=3044/3046 follow-up: 6 months	enalapril (1 mg IV infusion +5-20 mg PO daily) for 6 months versus placebo	patients with acute myocardial infarctions and blood pressure above 100/60 mm Hg, <24h of MI	Parallel groups double blind Scandinavia
<b>Schulman , 1995</b> n=22/21 follow-up: 1 year	intravenous enalaprilat (1 mg) then oral treatment for 1 month versus placebo	patients with an acute Q-wave AMI within 24 hours of symptom onset	Parallel groups double blind US

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>

## References

### **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]

### **CONSENSUS 2, 1992:**

Swedberg K, Held P, Kjekshus J, Rasmussen K, Ryden L, Wedel H Effects of the early administration of enalapril on mortality in patients with acute myocardial infarction. Results of the Cooperative New Scandinavian Enalapril Survival Study II (CONSENSUS II) N Engl J Med 1992 Sep 3;327:678-84 [1495520]

### Schulman, 1995:

Schulman SP, Weiss JL, Becker LC, Guerci AD, Shapiro EP, Chandra NC, Siu C, Flaherty JT, Coombs V, Taube JC Effect of early enalapril therapy on left ventricular function and structure in acute myocardial infarction. Am J Cardiol 1995;76:764-70 [7572651]

## 2 hypertension

Trial	Treatments	Patients	Trials design and methods
<b>enalapril vs diuretics</b>			
ANBP2 , 2003 n=3044/3039 follow-up: 4.1 y	enalapril versus hydrochlorothiazide	subjects with hypertension 65 to 84 years	Parallel groups open Australia
<b>enalapril vs nisoldipine</b>			
ABCD (H) , 1998 n=235/235 follow-up: 53 y	enalapril versus nisoldipine	patients with non-insulin-dependent diabetes and hypertension	double blind

More details and results :

- anti hypertensive agents for hypertension in elderly (60 years and more) at <http://www.trialresultscenter.org/go-Q9>
- anti hypertensive agents for hypertension in all type of patient at <http://www.trialresultscenter.org/go-Q13>

## References

### ANBP2, 2003:

Wing LM, Reid CM, Ryan P, Beilin LJ, Brown MA, Jennings GL, Johnston CI, McNeil JJ, Macdonald GJ, Marley JE, Morgan TO, West MJ A comparison of outcomes with angiotensin-converting-enzyme inhibitors and diuretics for hypertension in the elderly. N Engl J Med 2003;348:583-92 [12584366]

### ABCD (H), 1998:

Estacio RO, Jeffers BW, Hiatt WR, Biggerstaff SL, Gifford N, Schrier RW The effect of nisoldipine as compared with enalapril on cardiovascular outcomes in patients with non-insulin-dependent diabetes and hypertension. N Engl J Med 1998 Mar 5;338:645-52 [9486993]

## 3 heart failure

Trial	Treatments	Patients	Trials design and methods
<b>enalapril vs control</b>			

continued...

Trial	Treatments	Patients	Trials design and methods
Enalapril CHF investigators , 1987 n=126/130 follow-up:	-	-	
Rucinska-a (enalapril) , 1991 <i>unpublished</i> n=67/65 follow-up:	-	-	
Rucinska-b (enalapril) , 1991 <i>unpublished</i> n=55/55 follow-up:	-	-	
<b>enalapril vs placebo</b>			
CASSIS (enalapril) , 1995 n=48/48 follow-up: 12 weeks	enalapril 5-10mg daily versus placebo	patients with chronic congestive heart failure of NYHA classes II-IV	Parallel groups double blind
Chrysant , 1985 n=NA follow-up: 14 weeks	enalapril versus placebo	patients with congestive heart failure (CHF), New York Heart Association class II-III	double blind
Cleland , 1985 n=10/10 follow-up: 8 weeks	enalapril titrated up to 40mg once daily versus placebo	patients with New York Heart Association functional class II to IV heart failure who were clinically stable on digoxin and diuretic therapy	Cross over double blind
CONSENSUS , 1987 n=127/126 follow-up: 188 days	enalapril (2.5 to 40 mg per day) versus placebo	severe congestive heart failure (New York Heart Association [NYHA] functional class IV)	Parallel groups double blind Finland, Sweden, Norway
Dickstein , 1991 n=20/21 follow-up: 48 weeks	enalapril versus placebo	men with symptomatic heart failure (functional class II or III) and documented myocardial infarction greater than 6 months previously	double blind
McGrath , 1985 n=13/12 follow-up: 12 week	enalapril versus placebo	patients with chronic congestive cardiac failure	double blind
Sharpe , 1984 n=18/18 follow-up: 3 months	enalapril 5mg twice day versus placebo	patients with New York Heart Association functional class II to III heart failure who were clinically stable on digoxin and diuretic therapy	double blind

continued...

<b>Trial</b>	<b>Treatments</b>	<b>Patients</b>	<b>Trials design and methods</b>
<b>SOLVD prevention , 1992</b> [NCT00000516] n=2111/2117 follow-up: 3.1 y	Enalapril initial dose 25 or 5 mg twice daily up to 10 mg twice daily versus placebo	MI >1 month, No treatment for CHF, LVEF <=35%	Parallel groups double blind
<b>SOLVD treatment , 1991</b> [NCT00000516] n=1285/1284 follow-up: 3.5 y	Enalapril initial dose 25 or 5 mg twice daily up to 10 mg twice daily versus placebo	MI >1 month, Congestive HF, LVEF <=35%	Parallel groups Double blind
<b>enalapril vs enalapril</b>			
<b>NETWORK (2.5 bid vs 10 bid) , 1998</b> n=506/516 follow-up: 6 months	enalapril 2.5 mg twice daily versus enalapril 10 mg twice daily	patients with NYHA II-IV heart failure	Parallel groups double blind UK
<b>NETWORK (5 bid vs 10 bid) , 1998</b> n=510/516 follow-up: 6 months	enalapril 5 mg twice daily versus enalapril 10 mg twice daily	patients with NYHA II-IV heart failure	Parallel groups double blind UK
<b>enalapril vs hydralazine+ISDN</b>			
<b>V-HeFT II , 1991</b> n=403/401 follow-up: 2.5y (range 0.5-5.7y)	enalapril 20mg daily versus hydralazine 300 mg plus isosorbide dinitrate 160 mg daily	men with chronic congestive heart failure and cardiac dilatation (CT ratio>0.55) or LVEF <45% in association with reduced exercise tolerance and diuretic therapy	Parallel groups double blind
<b>carvedilol+enalapril vs enalapril</b>			
<b>CARMEN (carvedilol+enalapril) , 2004 ongoing</b> n=191/190 follow-up: 18 months	carvedilol (target 25 mg bid) + enalapril (target 10 mg bid) versus enalapril (target 10 mg bid)	patients with mild heart failure	NA

More details and results :

- angiotensin-Converting Enzyme Inhibitors for heart failure in all type of heart failure at <http://www.trialresultscenter.org/go-Q43>
- beta-blockers for heart failure in all type of heart failure at <http://www.trialresultscenter.org/go-Q44>

## References

**Enalapril CHF investigators, 1987:**

Enalapril CHF Investigators Long-term effects of enalapril in patients with congestive heart failure: a multicenter, placebo-controlled trial. *Heart Failure*. 1987;3:102-107

**Rucinska-a (enalapril), 1991:**

unpublished

**Rucinska-b (enalapril), 1991:**

unpublished

**CASSIS (enalapril), 1995:**

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**Chrysant, 1985:**

Chrysant SG, Gollub S, Dunn MI, Bal IS, Dreiling R, Konijeti JR Hemodynamic and metabolic effects of enalapril in patients with heart failure. *Clin Cardiol* 1985;8:585-90 [[2998663](#)]

**Cleland, 1985:**

Cleland JG, Dargie HJ, Ball SG, Gillen G, Hodsman GP, Morton JJ, East BW, Robertson I, Ford I, Robertson JI Effects of enalapril in heart failure: a double blind study of effects on exercise performance, renal function, hormones, and metabolic state *Br Heart J* 1985;54:305-12 [[2994698](#)]

**CONSENSUS, 1987:**

Effects of enalapril on mortality in severe congestive heart failure. Results of the Cooperative North Scandinavian Enalapril Survival Study (CONSENSUS). The CONSENSUS Trial Study Group. *N Engl J Med* 1987 Jun 4;316:1429-35 [[2883575](#)]

**Dickstein, 1991:**

Dickstein K, Barvik S, Aarsland T Effect of long-term enalapril therapy on cardiopulmonary exercise performance in men with mild heart failure and previous myocardial infarction. *J Am Coll Cardiol* 1991;18:596-602 [[1856429](#)]

**McGrath, 1985:**

McGrath BP, Arnolda L, Matthews PG, Jackson B, Jennings G, Kiat H, Johnston CI Controlled trial of enalapril in congestive cardiac failure. *Br Heart J* 1985;54:405-14 [[2996575](#)]

**Sharpe, 1984:**

Sharpe DN, Murphy J, Coxon R, Hannan SF Enalapril in patients with chronic heart failure: a placebo-controlled, randomized, double-blind study. *Circulation* 1984;70:271-8 [[6329547](#)]

**SOLVD prevention, 1992:**

Effect of enalapril on mortality and the development of heart failure in asymptomatic patients with reduced left ventricular ejection fractions. The SOLVD Investigators *N Engl J Med* 1992;327:685-91 [[1463530](#)] [10.1056/NEJM199209033271003](#)

**SOLVD treatment, 1991:**

Effect of enalapril on survival in patients with reduced left ventricular ejection fractions and congestive heart failure. The SOLVD Investigators *N Engl J Med* 1991;325:293-302 [[2057034](#)] [10.1056/NEJM199108013250501](#)

**NETWORK (2.5 bid vs 10 bid), 1998:**

Clinical outcome with enalapril in symptomatic chronic heart failure; a dose comparison. The NETWORK Investigators. *Eur Heart J* 1998 Mar;19:481-9 [[9568453](#)]

**NETWORK (5 bid vs 10 bid), 1998:**

Clinical outcome with enalapril in symptomatic chronic heart failure; a dose comparison. The NETWORK Investigators. Eur Heart J 1998 Mar;19:481-9 [9568453]

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Cohn JN, Johnson G, Ziesche S, Cobb F, Francis G, Tristani F, Smith R, Dunkman WB, Loeb H, Wong M A comparison of enalapril with hydralazine-isosorbide dinitrate in the treatment of chronic congestive heart failure. N Engl J Med 1991;325:303-10 [2057035]

**CARMEN (carvedilol+enalapril), 2004:**

ongoing trial

Remme WJ, Riegger G, Hildebrandt P, Komajda M, Jaarsma W, Bobbio M, Soler-Soler J, Scherhag A, Lutiger B, Rydn L The benefits of early combination treatment of carvedilol and an ACE-inhibitor in mild heart failure and left ventricular systolic dysfunction. The carvedilol and ACE-inhibitor remodelling mild heart failure evaluation trial (CARMEN). Cardiovasc Drugs Ther 2004 Jan;18:57-66 [15115904]

Komajda M, Lutiger B, Madeira H, Thygesen K, Bobbio M, Hildebrandt P, Jaarsma W, Riegger G, Rydn L, Scherhag A, Soler-Soler J, Remme WJ Tolerability of carvedilol and ACE-Inhibition in mild heart failure. Results of CARMEN (Carvedilol ACE-Inhibitor Remodelling Mild CHF EvaluatioN). Eur J Heart Fail 2004 Jun;6:467-75 [15182773]

Remme WJ The Carvedilol and ACE-Inhibitor Remodelling Mild Heart Failure EvaluatioN trial (CARMEN)–rationale and design. Cardiovasc Drugs Ther 2001 Jan;15:69-77 [11504166]

**4 atrial fibrillation**

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Trial	Treatments	Patients	Trials design and methods
<b>enalapril vs control</b>			
Ueng , 2003 n=70/75 follow-up: 270 days (range 61-575d)	enalapril versus control	atrial fibrillation	Parallel groups open
<b>enalapril vs placebo</b>			
SOLVD (AF ancillary study) , 2003 n=186/188 follow-up: 2.9 y	enalapril versus placebo	Heart failure	

More details and results :

- prevention for atrial fibrillation in patient with history of atrial fibrillation at <http://www.trialresultscenter.org/go-Q328>
- prevention for atrial fibrillation in patients without history of AF (primary prevention) at <http://www.trialresultscenter.org/go-Q331>

## References

### Ueng, 2003:

Ueng KC, Tsai TP, Yu WC, Tsai CF, Lin MC, Chan KC, Chen CY, Wu DJ, Lin CS, Chen SA Use of enalapril to facilitate sinus rhythm maintenance after external cardioversion of long-standing persistent atrial fibrillation. Results of a prospective and controlled study. Eur Heart J 2003;24:2090-8 [14643269]

### SOLVD (AF ancillary study), 2003:

Vermes E, Tardif JC, Bourassa MG, Racine N, Levesque S, White M, Guerra PG, Ducharme A Enalapril decreases the incidence of atrial fibrillation in patients with left ventricular dysfunction: insight from the Studies Of Left Ventricular Dysfunction (SOLVD) trials. Circulation 2003;107:2926-31 [12771010] 10.1161/01.CIR.0000072793.81076.D4

## 5 diabetes type 2

Trial	Treatments	Patients	Trials design and methods
<b>enalapril vs placebo</b>			
SCAT (diabetic subgroup) , 2000 n=25/25 follow-up: Jun 1991 - Jul 1995	enalapril 2.5mg twice daily versus placebo	normocholesterolemic patients	Factorial plan double-blind Canada
SOLVD (subgroup) , 1996 n=646/664 follow-up: 3.5y	enalapril versus placebo	patients with chronic heart failure	Parallel groups double-blind

More details and results :

- anti hypertensive agents for diabetes type 2 in patients with or without hypertension at <http://www.trialresultscenter.org/go-Q414>

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### SCAT (diabetic subgroup), 2000:

Teo KK, Burton JR, Buller CE, Plante S, Catellier D, Tymchak W, Dzavik V, Taylor D, Yokoyama S, Montague TJ Long-term effects of cholesterol lowering and angiotensin-converting enzyme inhibition on coronary atherosclerosis: The Simvastatin/Enalapril Coronary Atherosclerosis Trial (SCAT). Circulation 2000;102:1748-54 [11023927]

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### SOLVD (subgroup), 1996:

Shindler DM, Kostis JB, Yusuf S, Quinones MA, Pitt B, Stewart D, Pinkett T, Ghali JK, Wilson AC Diabetes mellitus, a predictor of morbidity and mortality in the Studies of Left Ventricular Dysfunction (SOLVD) Trials and Registry. Am J Cardiol 1996;77:1017-20 [8644628]

Anker SD, Negassa A, Coats AJ, Afzal R, Poole-Wilson PA, Cohn JN, Yusuf S Prognostic importance of weight loss in chronic heart failure and the effect of treatment with angiotensin-converting-enzyme inhibitors: an observational study. *Lancet* 2003;361:1077-83 [12672310] 10.1016/S0140-6736(03)12892-9

## 6 patients at high risk for cardiovascular events

Trial	Treatments	Patients	Trials design and methods
<b>enalapril vs placebo</b>			
CAMELOT (enalapril) , 2004 n=673/655 follow-up: 24 months	Enalapril 20mg daily versus Placebo	patients with angiographically documented CAD (>20% stenosis by coronary angiography) and diastolic blood pressure <100 mm Hg	Parallel groups double blind

More details and results :

- angiotensin-Converting Enzyme Inhibitors for patients at high risk for cardiovascular events in all type of patients at <http://www.trialresultscenter.org/go-Q98>
- inhibition of the renin-angiotensin system (ACEI or ARB) for patients at high risk for cardiovascular events in all type of patients at <http://www.trialresultscenter.org/go-Q157>

## References

### CAMELOT (enalapril), 2004:

Nissen SE, Tuzcu EM, Libby P, Thompson PD, Ghali M, Garza D, Berman L, Shi H, Buebendorf E, Topol EJ Effect of antihypertensive agents on cardiovascular events in patients with coronary disease and normal blood pressure: the CAMELOT study: a randomized controlled trial. *JAMA* 2004 Nov 10;292:2217-25 [15536108]

Entry terms: carvedilol, carvedilol, Querto, Coreg, Dilatrend, Kredex, Coropres, Eucardic, BM 14190, BM-14190, captopril, SQ-14534, SQ 14534, SQ14534, SQ-14225, SQ 14225, SQ14225, Capoten, Lopirin,