



BRIEF PRESCRIBING GUIDE

Angiotensin Converting Enzyme Inhibitors [ACE Inhibitors] / Angiotensin Receptor Blockers [ARBs]

FORMULARY CHOICES

The APC evidence based and cost effective formulary choices (APC 66004) are:

ACE Inhibitors: **Ramipril, lisinopril, perindopril erbumine**, enalapril

ARBs: **Losartan**, candesartan

Preferred choices in bold and larger font

Indications

Heart Failure [Left Ventricular Systolic Dysfunction]¹

- Any formulary ACE inhibitor usually combined with beta blocker or low cost ARB if intolerant to ACE inhibitor

Post MI²

- Only ramipril, if clinical evidence of heart failure, or perindopril erbumine

Chronic Kidney Disease³

- Slows decline in renal function in patients with proteinuria and prevents cardiovascular disease
- Target: Non-diabetics <140/90
Diabetics with/without Microalbuminuria <130/80

Hypertension⁴

- First line in diabetics patients and anyone aged under 55 (unless pregnant / black person of African or Caribbean family origin)
- Target: Under 80 years <140/90
Over 80 years <150/90

Titrate to maximum tolerated dose according to schedules below

Increase dose until at target BP

Note: Maximum doses below

Contra-indications⁵

- Pregnancy & breastfeeding
- CKD 4/5 – refer to renal team
- Confirmed renal artery stenosis
- Severe hepatic impairment

Drug Interactions⁵

- Lithium:** Increased plasma concentration of lithium, so check Li when initiating (see below).
- Diuretics:** If initiating ACE in a patient already taking diuretic, start at lowest dose. **Avoid prescribing with potassium-sparing diuretics.**

Common side-effects⁵

- Hypotension (dizziness), especially in the elderly
- Hyperkalaemia
- Persistent dry cough (10%)
- Significant rise in creatinine:
 - There is often a small rise in creatinine when initiated or the dose increased
 - Stop if there is a rise in creatinine >30% when checked within 2 weeks of starting or changing dose and consider discussing with the renal team
 - If there is an increase in creatinine of 15-30%, repeat the test after a further 2 weeks and consider halving the dose

Other issues

- ACE inhibitors should **not** be combined with ARBs **except** when started by consultant in heart failure patients or when an ACE inhibitor at maximum tolerated dose plus a beta-blocker have failed to control symptoms.
- Perindopril erbumine version should be prescribed **not** perindopril arginine – same drug effect, but the new salt is considerably more expensive.

Titrate dose and monitor (to avoid hypotension and hyperkalaemia)

Treatment schedules⁵

CKD and Hypertension

Heart Failure & Post-MI

Starting doses

Warn re risk of dizziness and cough
Check renal function after one week
Follow up appointment after two weeks

	Hypertension					Heart failure				
	Ramipril	Lisinopril	Perindopril	Losartan	Candesartan	Ramipril	Lisinopril	Perindopril	Losartan	Candesartan
Starting dose	1.25mg-2.5mg od	10mg od	4mg od	50mg od	8mg od	1.25mg od	2.5mg od	2mg od	12.5mg od	4mg od
...If patient already on diuretic		2.5mg od	2mg od	25mg od	4mg od	1.25mg od	2.5mg od	2mg od	12.5mg od	4mg od
Titration interval	2-4 weeks	2 weeks	1month	several weeks	4 weeks	1-2 weeks	2 weeks	2 weeks	1 week	2 weeks
Target maintenance		20mg od			usual 8mg	maximum tolerated	maximum tolerated	maximum tolerated	maximum tolerated	maximum tolerated
Maximum dose	10mg od	80mg od	8mg od	100mg od	32mg od	10mg (5mg bd)	35mg od	4mg od	50mg od	32mg od

2 Week follow up appointment

Ask about cough and other side effects
Check BP (see targets above)

- Increase according to dose chart until BP to target or patient has reached maximum tolerated dose
- Repeat renal function one week after any dose increase

Is BP controlled or at maximum tolerated dose (for heart failure and post MI)?

Check renal function and review

NO

YES

6 Week follow up appointment

Ask about side effects
Check BP (see targets above)
Check renal function one week before

Then check annually

References:

- 1: NICE Clinical Guideline – CG 108: Chronic heart failure
- 2: NICE Clinical Guideline – CG48: MI: Secondary prevention
- 3: NICE Clinical Guideline – CG73: Chronic kidney disease
- 4: NICE Clinical Guideline – CG127: Hypertension
- 5: BNF 61