

ACEIs or ARBs

For Adults With Hypertension Clinician's Guide

This guide summarizes evidence comparing the effectiveness and safety of angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin II receptor antagonists (ARBs) when used for adults with essential hypertension. The evidence is derived from research studies comparing an ACEI with an ARB.

This guide does not review studies comparing individual drugs within each class or evidence about using ACEIs and ARBs for congestive heart failure or diabetic kidney disease.

Clinical Issue

Both ACEIs and ARBs target the renin-angiotensin-aldosterone system. As these drugs are equally effective for hypertension, the choice between ACEIs and ARBs will depend on the balance of side effects and cost. See the table on the reverse for typical doses and prices.

Side Effects

Rates of side effects, such as headache and dizziness, are about the same for ACEIs and ARBs. The only significant difference is the rate of dry cough. Cough occurs for 1–3 percent of people taking an ARB, and cough is about three times more common for people taking an ACEI. On average, discontinuation rates due to side effects are 3 percent for people taking an ARB and 8 percent for those taking an ACEI.

Serious Risks

Angioedema

Angioedema was so infrequently reported by people taking ACEIs and ARBs that it is not possible to estimate the actual risk. However, in the reviewed studies, it was reported only by people taking ACEIs, about 1 in 10,000.

Risk in Pregnancy

When used during the second and third trimesters of pregnancy, ACEIs and ARBs can cause injury and even death to the developing fetus.

Clinical Bottom Line

Based on studies that compare an ACEI with an ARB, we know that:

- ACEIs and ARBs work equally well to help adults with essential hypertension achieve blood pressure control.

LEVEL OF CONFIDENCE ● ● ●

- Side effects are minimal. The main difference is that ACEIs are more likely than ARBs to cause a dry cough.

LEVEL OF CONFIDENCE ● ● ●

- Both ACEIs and ARBs reduce proteinuria in people who have hypertension. They do not differ in the amount of proteinuria reduction. Neither ACEIs nor ARBs change serum creatinine levels.

LEVEL OF CONFIDENCE ● ● ○

- ACEIs and ARBs do not affect lipid levels or control of diabetes.

LEVEL OF CONFIDENCE ● ● ○

Confidence Scale

The confidence ratings in this guide are derived from a systematic review of the literature. The level of confidence is based on the overall quantity and quality of clinical evidence.

- ● ● **High** There are consistent results from good quality studies.
- ● ○ **Medium** Findings are supported, but further research could change the conclusions.
- ○ ○ **Low** There are very few studies, or existing studies are flawed.

Source

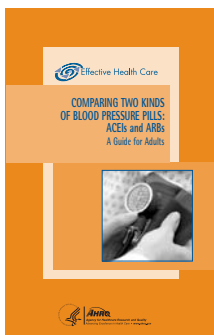
The source material for this guide is a systematic review of 61 research studies in which an ACEI was compared with an ARB. The review, *Comparative Effectiveness of Angiotensin-Converting Enzyme Inhibitors (ACEIs) and Angiotensin II Receptor Antagonists (ARBs) for Treating Essential Hypertension* (2007), was prepared by the Duke Evidence-based Practice Center. The Agency for Healthcare Research and Quality (AHRQ) funded the systematic review and this guide. The guide was developed using feedback from clinicians who reviewed preliminary drafts.

Still Unknown

Comparative studies have not yet determined if ACEIs and ARBs differ in:

- Rates of major cardiovascular events.
- Likelihood of developing diabetes.
- Effect on heart size and function.
- Effectiveness or tolerability for people taking other medications or with other medical problems.
- How well they work for men, women, people of different ages, or different ethnic groups.

Resource for Patients



Comparing Two Kinds of Blood Pressure Pills: ACEIs and ARBs, A Guide for Adults is a companion to this Clinician's Guide. It can help people talk with their health care professionals about the effectiveness, side effects, and prices of ACEIs and ARBs.

For More Information

For electronic copies of the consumer's guide, this clinician's guide, and the full systematic review, visit this Web site:

www.effectivehealthcare.ahrq.gov

For free print copies call:

The AHRQ Publications Clearinghouse
(800) 358-9295

Consumer's Guide,

AHRQ Pub. No. 08-EHC003-2A

Clinician's Guide,

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AHRQ created the John M. Eisenberg Center at Oregon Health & Science University to make research useful for decisionmakers. This guide was prepared by Bruin Rugge, M.D., Theresa Bianco, Pharm.D., Sandra Robinson, M.S.P.H., Valerie King, M.D., Martha Schechtel, R.N., and David Hickam, M.D., of the Eisenberg Center.

Dose and Price of ACEIs		DOSE FOR HYPERTENSION ¹	PRICE FOR 1-MONTH SUPPLY ²	
DRUG NAME	BRAND NAME		GENERIC	BRAND
Benazepril ³	Lotensin®	10 mg daily	\$30	\$45
		20 mg daily	\$30	\$45
		40 mg daily	\$30	\$45
Captopril	Capoten®	25 mg bid	\$40	\$115
		50 mg bid	\$75	\$200
Enalapril	Vasotec®	5 mg daily	\$30	\$45
		10 mg daily	\$30	\$45
		20 mg daily	\$45	\$65
		20 mg bid	\$90	\$135
Fosinopril	Monopril®	10 mg daily	\$35	\$45
Lisinopril	Prinivil®, Zestril®	10 mg daily	\$30	\$35
		20 mg daily	\$30	\$40
		40 mg daily	\$45	\$55
Moexipril ³	Univasc®	7.5 mg daily	NA	\$45
		15 mg daily		\$50
		15 mg bid		\$95
Perindopril	Aceon®	2 mg daily	NA	\$50
		4 mg daily		\$55
		8 mg daily		\$70
Quinapril	Accupril®	10 mg daily	\$35	\$45
		20 mg daily	\$35	\$45
Ramipril	Altace®	2.5 mg daily	NA	\$50
		5 mg daily		\$50
		10 mg daily		\$60
Trandolapril	Mavik®	1 mg daily	NA	\$40
		2 mg daily		\$40

Dose and Price of ARBs		DOSE FOR HYPERTENSION ¹	PRICE FOR 1-MONTH SUPPLY ²	
DRUG NAME	BRAND NAME		GENERIC	BRAND
Candesartan	Atacand®	4 mg daily	NA	\$55
		8 mg daily		\$55
		16 mg daily		\$55
Eprosartan	Teveten®	400 mg daily	NA	\$65
		600 mg daily		\$75
		400 mg bid		\$130
Irbesartan	Avapro®	150 mg daily	NA	\$55
		300 mg daily		\$70
Losartan	Cozaar®	25 mg daily	NA	\$55
		50 mg daily		\$60
		100 mg daily		\$80
Olmesartan ³	Benicar®	20 mg daily	NA	\$50
		40 mg daily		\$60
Telmisartan	Micardis®	20 mg daily	NA	\$50
		40 mg daily		\$60
		80 mg daily		\$65
Valsartan	Diovan®	80 mg daily	NA	\$60
		160 mg daily		\$65

¹Doses are representative of those used in the research studies. ²Average Wholesale Price from *Drug Topics Redbook*, 2007. ³This drug was not individually evaluated in the comparative studies included in the review. NA=not available as generic. bid=twice a day.