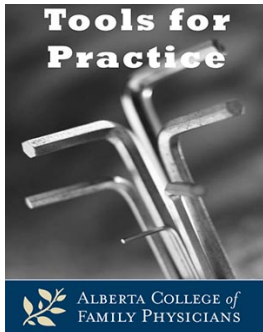


Tools for Practice is proudly sponsored by the Alberta College of Family Physicians (ACFP). ACFP is a provincial, professional voluntary organization, representing more than 4,400 family physicians, family medicine residents and medical students in Alberta. Established over sixty years ago, the ACFP strives for excellence in family practice through advocacy, continuing medical education and primary care research. www.acfp.ca

Reviewed: August 22, 2016
Evidence Updated: New evidence
Bottom Line: Minor change
First Published: November 30, 2009



Atenolol & Beta-Blockers for Primary Hypertension: Do They Perform Under Pressure?

Clinical Question: Are beta-blockers, particularly atenolol, as effective as other antihypertensive medications in preventing important outcomes in hypertensive patients?

Bottom-line: Atenolol is an inferior choice for blood pressure treatment. Other antihypertensive classes (ACEI/ARB, calcium-channel blocker, diuretic) should all generally be considered first before using beta-blockers in patients with uncomplicated hypertension.

Evidence:

- Multiple large meta-analyses have examined this question:
 - 2005 meta-analysis¹ compared all beta-blockers against other antihypertensives (13 trials; 105,951 patients) over 2.7-10 years.
 - Beta-blockers versus all other antihypertensives:
 - Statistically significantly increased risk of stroke [Number Needed to Harm (NNH)=461].
 - No difference in myocardial infarction or death.
 - Atenolol versus non-beta-blocker antihypertensives:
 - Statistically significant increased stroke (NNH ~130) and death (NNH ~140).
 - Similar results in 2004 meta-analysis by same authors,² Cochrane review,³ and newer meta-analysis.⁴
 - Beta-blockers worse than ACEIs/ARBs, calcium-channel blockers, and diuretics.⁴
 - 2006 meta-analysis⁵ stratifying trials by age subgroup found different effects when comparing beta-blockers to other antihypertensives:
 - <60 years: Relative risk 0.97 (0.88-1.07).
 - ≥60 years: Relative risk 1.06 (1.01-1.10).
 - Limitations: Age cutoff arbitrary and based on trial-wide mean age rather than individual-patient data, thus between-age difference could merely be due to chance or methodological differences between trials.

- 2014 meta-analysis found largely consistent results between atenolol and other beta-blockers versus other antihypertensives.⁶
- Limitations: Atenolol was the beta-blocker taken by 75% of trial participants,³ multiple different comparator drugs from different classes pooled together.

Context:

- Guidelines recommend against beta-blockers as 1st-line therapy for uncomplicated hypertension in general (UK⁷) or specifically in patients ≥ 60 years (Canada⁸), unless there are comorbid conditions which benefit from beta-blockers.
- Beta-blockers are highly effective agents in patients with other indications (such as post-myocardial infarction⁹ or heart failure with reduced ejection fraction¹⁰).

Original Authors:

G. Michael Allan MD CCFP, Christina Korownyk MD CCFP

Updated:

Ricky D. Turgeon BSc(Pharm) ACPR PharmD

Reviewed:

G. Michael Allan MD CCFP

References:

1. Lindholm LH, Carlberg B, Samuelsson O. *Lancet*. 2005; 366:1545-53.
2. Carlberg B, Samuelsson O, Lindholm LH. *Lancet*. 2004; 364:1684-9.
3. Wiysonge CS, Bradley HA, Volmink J, *et al*. *Cochrane Database Syst Rev*. 2012; 11:CD002003.
4. Etehad D, Emdin CA, Kiran A, *et al*. *Lancet*. 2016; 387:957-67.
5. Khan N, McAlister FA. *CMAJ*. 2006; 174:1737-42.
6. Kuyper LM, Khan NA. *Can J Cardiol*. 2014; 30:S47-S53.
7. NICE Hypertension Guidelines. 2011. Available for download at: <https://www.nice.org.uk/guidance/cg127/>. Last accessed: August 22, 2016.
8. Leung AA, Nerenberg K, Daskalopoulou SS, *et al*. *Can J Cardiol*. 2016; 32:569-88.
9. Freemantle N, Cleland J, Young P, *et al*. *BMJ*. 1999; 318:1730-7.
10. Ko DT, Hebert PR, Coffey CS, *et al*. *Arch Intern Med*. 2004; 164:1389-94.

Tools for Practice is a biweekly article summarizing medical evidence with a focus on topical issues and practice modifying information. It is coordinated by G. Michael Allan, MD, CCFP and the content is written by practising family physicians who are joined occasionally by a health professional from another medical specialty or health discipline. Each article is peer-reviewed, ensuring it maintains a high standard of quality, accuracy, and academic integrity. If you are not a member of the ACFP and would like to receive the TFP emails, please sign up for the distribution list at <http://bit.ly/signupfortfp>. Archived articles are available on the ACFP website.

This communication reflects the opinion of the authors and does not necessarily mirror the perspective and policy of the Alberta College of Family Physicians.