



Effective Health Care

Effects of Blood Pressure Medications on Kidney Function Nomination Summary Document

Results of Topic Selection Process & Next Steps

- The topic area, *Effects of Blood Pressure Medications on Kidney Function*, was found to be addressed by two AHRQ comparative effectiveness reviews, an evidence-based guideline from the Eighth Joint National Committee (JNC 8), and two evidence-based guidelines from the Veterans Affairs/Department of Defense (VA/DoD). Given that the existing products, as well as additional guidelines and systematic reviews identified in our search, cover this nomination, no further activity will be undertaken on this topic.

AHRQ Comparative Effectiveness Reviews

- Chronic Kidney Disease Stages 1–3: Screening, Monitoring, and Treatment. Comparative Effectiveness Reviews, No. 37. Rockville (MD): Agency for Healthcare Research and Quality (US); 2012 Jan. Report No.: 11(12)-EHC075-EF.
- Angiotensin-Converting Enzyme Inhibitors (ACEIs), Angiotensin II Receptor Antagonists (ARBs), and Direct Renin Inhibitors for Treating Essential Hypertension: An Update. Comparative Effectiveness Reviews, No. 34. Rockville (MD): Agency for Healthcare Research and Quality (US); 2011 Jun. Report No.: 11-EHC063-EF.

Guidelines

- James PA, Oparil S, Carter BL, et al. 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults: Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). *JAMA*. 2014;311(5):507-520.
- Management of Hypertension. (2014). VA/DoD clinical practice guideline for the management of Hypertension (HTN) in primary care. Version 3.0. Washington, DC: Veterans Health Administration and Department of Defense.
- Chronic Kidney Disease Working Group. (2008). VA/DoD clinical practice guideline for the management of chronic kidney disease in primary care. Version 2.0. Washington, DC: Veterans Health Administration and Department of Defense.

Topic Description

Nominator(s): Individual

Nomination Summary: The nominator expressed concern with the potential negative effects of anti-hypertensive medications on kidney function.

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Topic Number(s): 0564
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Population(s): Adults with hypertension

Intervention(s): Diuretics, calcium channel blockers (CCBs), angiotensin-converting-enzyme inhibitors (ACE inhibitors), angiotensin II receptor blockers (ARBs), or beta-blockers

Comparator(s): One of the other classes of drugs, a combination of the classes, or placebo

Outcome(s): Kidney function; end stage renal disease

Key Questions from Nominator: The nominator asked "Does high blood pressure medication... have a negative effect on the kidneys?"

We have expanded the scope of this question to identify the various impacts that antihypertensive medications have on kidney function and CKD. It is important to note that evidence supports the efficacy of antihypertensive medications to prevent CKD, slow the progression of renal decline, and prevent end-stage renal disease.

Considerations

- Hypertension, or high blood pressure, is the most common condition diagnosed and treated in primary care. From 2007 – 2010, the prevalence of hypertension in the US was 29.6% among adults. Hypertension is also a major risk factor for loss of renal function, or chronic kidney disease (CKD), and subsequently, end-stage renal disease (ESRD).
- Many pharmacotherapies have been shown to be effective in reducing blood pressure. Control of hypertension, achieved through these drugs and through lifestyle interventions, is also beneficial in slowing the progression of CKD and maintaining kidney function. Many of these pharmacologic therapies are also used to treatment CKD that presents without hypertension.
- This topic area was found to be addressed by a 2012 AHRQ comparative effectiveness review titled *Chronic Kidney Disease Stages 1-3* and a 2011 AHRQ comparative effectiveness review titled *Angiotensin-Converting Enzyme Inhibitors (ACEIs), Angiotensin II Receptor Antagonists (ARBs), and Direct Renin Inhibitors for Treating Essential Hypertension: An Update*, among other systematic reviews, including a number of Cochrane systematic reviews.
 - The 2012 review included trials comparing these ACEIs and ARBs with placebo and with all other classes of anti-hypertensive drugs as well as trials comparing ACEIs in combination with diuretics and ARBs in combination with diuretics vs. all other classes. The majority of these comparison studies examined the impact of these drug classes on maintaining kidney function as well as their impact on creatinine, end-stage renal disease, and adverse effects.
 - The 2011 review focused on the use of ACEIs and ARBs (as well as direct renin inhibitors) for the treatment of essential, or uncomplicated, hypertension. The search for this review included all studies from 1966 – December 2010. This review did not find substantial evidence to support any meaningful difference in the outcomes between treatment with ACE inhibitors and ARBs, but supported the findings of a previous 2007 review, which found both to be effective for the treatment of hypertension and to maintain kidney function and reduce the risk for end-stage kidney disease.
- Among other guidelines, a search of the literature identified a 2014 guideline published in the *Journal of the American Medical Association (JAMA)* by the Eighth Joint National Committee (JNC 8), which

found consistently high quality evidence to support recommending the use of ACEIs, ARBs, and diuretics to control hypertension and slow the progression of CKD.

- The search also yielded two Veterans Affairs (VA)/Department of Defense (DoD) evidence-based clinical practice guidelines, one focused on the hypertension and one focused on CKD. *The Management of Hypertension in Primary Care guideline* was published in 2014. *The Management of Chronic Kidney Disease in Primary Care guideline*, published in 2008, is currently being updated. Both guidelines recommended the use of diuretics in uncomplicated hypertension, and further recommended ACEIs or ARBs in combination with diuretics for patients with hypertension and CKD.