

**Month/Year of Review:** January 2014  
**PDL Classes:** Calcium Channel Blockers

**Date of Last Review:** January 2012  
**Source Document:** OSU College of Pharmacy

**Current Status of PDL Class:**

- Preferred Agents: AMLODIPINE, NICARDIPINE, NIFEDIPINE ER 24, NIFEDIPINE ER SA, DILTIAZEM SR 24 HR, DILTIAZEM ER, DILTIAZEM HCL, VERAPAMIL HCL, VERAPAMIL HCL 24H
- Non-Preferred Agents: FELODIPINE, ISRADAPINE, NISOLDIPINE, NIMODIPINE (NIMOTOP®)

**Previous Conclusions and Recommendation:**

- The current evidence does not allow for comparisons of CCBs for the treatment of hypertension and does not differentiate amlodipine, diltiazem, isradipine, nicardipine, nifedipine, nisoldipine, or verapamil SR for efficacy, adverse effects and in subgroups for the treatment of hypertension. There is no evidence for bepridil and felodipine.
- The current evidence does not differentiate amlodipine, diltiazem, nicardipine, nifedipine, and nisoldipine for efficacy in the treatment of chronic stable angina. There is no evidence for felodipine and isradipine. No difference in efficacy was found between dihydropyridines and non-dihydropyridines for the treatment of angina.
- The current evidence does not differentiate between diltiazem or verapamil for efficacy and adverse effects in the treatment of supraventricular arrhythmias and there is no evidence in subgroups of patients.
- In the setting of CHF (defined as systolic dysfunction with a LVEF of < 45%) there is evidence that amlodipine and felodipine do not decrease survival or cause harm in this patient population, but neither do they improve survival nor decrease nonfatal cardiovascular events. In patients with systolic dysfunction the evidence does not demonstrate differences between amlodipine, felodipine nifedipine and nisoldipine on symptoms and exercise tolerance.

**Research Questions:**

- Is there any new comparative evidence on calcium channel blockers (CCBs) in the treatment of hypertension, angina, supraventricular arrhythmias, or systolic dysfunction on mortality, cardiovascular events, stroke, or quality of life?
- Is there any new comparative safety evidence of CCBs??
- Are there subpopulations of patients for which one medication or preparation is more effective or associated with fewer adverse effects?

**Methods:**

The DERP scan was used to identify any new comparative research that has emerged since the last P&T review.<sup>1</sup>

**Conclusions and Recommendations:**

- There is no new significant comparative evidence on the efficacy or safety of CCBs; no further review or research needed.
- Evaluate comparative costs in executive session.

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### **New Guidelines:**

Evidence-based guidelines for the treatment of hypertension were recently released from the Eighth Joint National Committee (JNC8)<sup>2</sup>. The following recommendations were made regarding the drug selection for the treatment of hypertension:

- In the general nonblack population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic, CCB, angiotensin-converting enzyme inhibitor (ACEI), or angiotensin receptor blocker (Moderate recommendation – Grade B).
  - These drug classes had comparable effects on overall mortality and CV, cerebrovascular, and kidney outcomes.
  - Initial treatment with a thiazide-type diuretic was more effective than a CCB or ACEI, and an ACEI was more effective than a CCB in improving heart failure outcomes.
- Calcium channel blockers should be dosed adequately to achieve results similar to those seen in RCTs. Evidence-based target doses for CCBs is as follows:
  - Amlodipine: 10mg
  - Diltiazem ER: 360 mg
  - Nitrendipine: 20 mg
- In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB (Moderate Recommendation – Grade B).
  - CCB's are recommended over an ACEI as first-line therapy in black patients because there was a 51% higher rate (RR 1.51; 95% CI 1.22-1.86) of stroke in black persons in ALLHAT with the use of an ACEI compared with the use of a CCB. The ACEI was also less effective in reducing BP in black individuals compared with the CCB.

### **References:**

1. Peterson K. Drug Effectiveness Review Project. Drug Class Review: Calcium Channel Blockers. Preliminary Scan Report #5. October 2013.
2. 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*. 2013. doi:10.1001/jama.2013.284427.