

## Indiana Medicaid Therapeutics Committee

### Therapeutic Class Review Summary

**Therapeutic class:**

Calcium Channel Blockers

**Overview:**

Calcium channel blockers inhibit the transmembrane influx of calcium ions into the vascular smooth muscle and the cardiac muscle, resulting in the dilation of the coronary and systemic arteries. The two types of calcium channel blockers are dihydropyridines and non-dihydropyridines. Non-dihydropyridines (verapamil, diltiazem) possess inotropic effects, which are favorable for supraventricular arrhythmias. Dihydropyridines (amlodipine, felodipine, nifedipine, nisoldipine, etc.) produce a more potent vasodilating effect.

The calcium channel blockers are indicated for hypertension, angina, or arrhythmias. Though these agents are not first line treatment for hypertension, calcium channel blockers are among the drugs recommended as initial therapy for patients with ischemic heart disease and/or diabetes. Nimodipine is a unique calcium channel blocker indicated to improve neurological deficits from subarachnoid hemorrhages. The calcium channel blocker bepridil is no longer available.

Recently, the Antihypertensive and Lipid Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) concluded that thiazide diuretics (chlorthalidone), which are less expensive, are superior to ACE inhibitors (lisinopril) and dihydropyridine calcium channel blockers (amlodipine) in preventing one or more major forms of cardiovascular disease. Studies have also shown that immediate-release nifedipine precipitates ischemic events and may increase coronary mortality. Overall, other antihypertensive drugs, such as ACE inhibitors and beta-blockers, have demonstrated more favorable results in mortality and morbidity.

The following calcium channel blockers are dihydropyridines: amlodipine, felodipine, nifedipine, isradipine, nimodipine, and nisoldipine. All dihydropyridines are available generically, except controlled-release isradipine and sustained-release nifedipine. Verapamil and diltiazem, non-dihydropyridines, are also available as generics.

Generic Name	Trade Name	Manufacturer	Generic
Amlodipine	Norvasc <sup>®</sup>	Pfizer	Y
Diltiazem	Cardizem <sup>®</sup> , Cartia <sup>®</sup> XT, Dilacor <sup>®</sup> XR, Diltia <sup>®</sup> XT, and Tiazac <sup>®</sup> , Lyo-Ject <sup>®</sup>	Various	Y
Felodipine	Plendil <sup>®</sup>	AstraZeneca	Y
Isradipine	DynaCirc <sup>®</sup> <i>(Immediate-release brand product discontinued)</i> DynaCirc CR <sup>®</sup>	Reliant, various	Y N
Nicardipine	Cardene <sup>®</sup> Cardene SR <sup>®</sup>	EKR Therapeutics, various	Y N
Nifedipine	Procardia <sup>®</sup> <i>(Brand product Adalat discontinued)</i>	Bayer, Pfizer	Y
Nimodipine	Nimotop <sup>®</sup>	Bayer	Y
Nisoldipine	Sular <sup>®</sup>	Sciele Pharma, various	Y
Verapamil	Calan <sup>®</sup> , Covera-HS <sup>®</sup> , Isoptin <sup>®</sup> and Verelan <sup>®</sup>	Searle, Knoll	Y

**Summary:**

Calcium channel blockers are not recommended as a first line antihypertensive treatment due to their association with ischemic heart events, the results of ALLHAT, and their lack of outcomes data on beneficial effects with long-term use. However, based on JNC-VII that was published in 2003, calcium channel blockers (CCBs) are among the drugs recommended as initial therapy for patients with ischemic heart disease, and long-acting CCBs are among the drugs recommended as initial therapy for patients with diabetes. Verapamil and diltiazem are non-dihydropyridine calcium channel blockers that are generically available; all dihydropyridines are available as generics, except controlled-release isradipine and sustained-release nicardipine. Selection of agents for the preferred drug list should be based upon FDA indications, generic availability, efficacy, and safety.