

CCB (Calcium Channel Blockers)

Dihydropyridines

amlodipine (Norvasc), +atorvastatin (Caduet), +benzapril (Lotrel), +olmesartan (Azor), +valsartan (Exforge)
nifedipine (Procardia, Adalat CC) some say more effective than amlodipine
felodipine (Plendil), +enalapril (Lexxel) not at BUMC
nisoldipine (Sular) not at BUMC
isradipine (DynaCirc CR) not at BUMC
nicardipine (Cardene) only one that can be given iv hence used for HTN emergency, when given PO BID-TID dosing
nimodipine (Nimotop) used for SAH

Benzothiazepines

diltiazem (Cardizem, many other names) comes in immediate release / short acting and slow release / long acting

Phenylalkylamines

verapamil (Calan, many other names) comes in immediate release / short acting and slow release / long acting

Mechanism

- Inhibits Ca Channel on Cardiac Muscle Cells
 - Negative Inotropic Effects
- Inhibits Ca Channel on Conducting Cells esp at **AV Node**
 - Negative Chronotropic (HR) / Dromotropic (Conduction Velocity) Effects
- Inhibits Ca Channel on Vessel Smooth Muscle Cells w/ **Vaso>Venodilation**

	Negative Ino/Chrono/Dromotropic Ability	Vessel Dilation Ability	Use
Dihydropyridines (-dipines)	X	+++	Decreases BP without affecting the heart except for weak reflex positive ino/chrono/dromotropic effects
Benzothiazepines (Diltiazem)	++	++	Not regularly used for decreasing BP b/c its negative effects on the heart are significant therefore only really used for slowing conduction from atria to ventricle as in AV blocks
Phenylalkylamines (Verapamil)	+++	+	Similar to dilt but more expensive, more SEs, harder to dose, and too much negative ino/chrono/dromotropic effects therefore rarely used even though great at blocking AV node

Side Effects & Contraindications (all are more significant with verapamil)

CNS

- dizziness (2/2 vasodilation)
- headaches (2/2 vasodilation)

CV

- bradycardia ± heart block (use esp verapamil cautiously in pts w/ any heart block, acutely decompensated CHF, et al)
- peripheral edema (seen in 10% of pts and can be impressive)
- flushing (2/2 vasodilation)
- hypotension (2/2 vasodilation)

GI

- constipation (esp verapamil)

Other

- dig toxicity (esp verapamil)
- quinidine toxicity

NB should not be used in post-MI pts b/c of increased mortality but the VALUE study showed this not to be the case

NB CCB have been associated w/ higher risk of progression of kidney disease

Other Vasodilators

Hydralazine (Apresoline) used in HTN

Minoxidil (Loniten) rarely used

Hydralazine Mechanism

- increase in cGMP → smooth muscle relaxation → peripheral vaso>venodilation

Minoxidil Mechanism

- stimulates K⁺ channel → hyperpolarization → smooth muscle relaxation → peripheral vaso>venodilation

Side Effects & Contraindications

CNS

- headaches 2/2 meningeal vasodilation

CV

- orthostatic hypotension 2/2 systemic vasodilation

Other (ONLY HYDRALAZINE)

- SLE-like-Syndrome: 10% of pts, reversible upon discontinuation, more common the higher the dose and the more cardiac/renal dysfxn

Other (ONLY MINOXIDIL)

- Hypertrichosis, weight gain, pericardial effusions



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