Cholesterol Medications

LDL Lowering Medications

Class / Action	Generic / Trade Name	Usual Daily Dose Range	LDL % Lowering	Considerations
"Statins" HMG- CoA Reductase Inhibitors Inhibits enzyme that converts HMG-CoA to mevalonate - limits cholesterol production	Atorvastatin / Lipitor*	10 – 80 mg	20- 60	Lowers TGs 7-30% Raise HDL 5-15% **Side effects**: weakness, muscle pain, elevated glucose levels. Review package insert for specific dosing adjustments based on drug, food interactions (ie grapefruit).
	Fluvastatin / Lescol* Lescol XL	20 – 80 mg 80 mg	20- 35	
	Lovastatin* Mevacor Altoprev XL	 20 - 80 mg 10 - 60 mg	20- 45	
	Pravastatin / Pravachol*	10 - 80 mg	20- 45	
	Rosuvastatin / Crestor	5 – 40 mg	20- 60	
	Simvistatin / Zocor*	20 – 40 mg	20- 55	
	Pitavastatin / Livalo	2 – 4 mg		
Bile Acid Sequestrants **Action:** Bind to bile acids in intestine, decreasing cholesterol production. Secondary action – raise HDL	Cholestyramine/ Questran*	4 to 16 g per day powder – 1 scoop 4g	Lower LDL by 15-30%	May raise TG levels. Raise HDL 3-5%. Avoid taking in same timeframe w/ other meds – may affect absorption (see package insert). Side effects: GI in nature
	Colesevelam / Welchol **Lowers A1c 0.5%**	3.75 x 1 daily 1.875 x 2 daily (625mg tablets)		
	Colestipol / Colestid	2 - 16 gms per day tabs Powder – 1 scoop = 5g 5 to 30 gm per day Mix w/ fluid		
Cholesterol Absorption Inhibitors	Ezetimibe / Zetia Zetia + Simvastatin (Vytorin)	10 mg – 1x daily 10/10 - 10/80 mg	15-20%	Usually used in combo w/statin. Headache, rash.
PCSK9 Inhibitors Proprotein convertase subtilisin/kexin type 9	Alirocumab (Praluent) Evolocumab (Repatha)	See last page	See last page	Subcutaneous injections See last page
Adenosine Triphosphate-citrate Lyase - ACL Inhibitor	Bempedoic acid (Nexletol) Bempedoic acid/ezetimibe (Nexlizet)	180 mg daily 180 mg /10mg daily	Add on for LDL reduction	May increase uric acid levels-use caution in gout
Plant Stenols	Benecol	3 servings daily	14%	Well tolerated
Plant Sterols	Take Control	2 servings daily	17%	

Triglyceride Lowering / HDL Raising Medications

If TG> 500, lower TG first, then reduce LDL.

Class / Action	Generic / Trade	Usual Daily Dose Range	Lowers TG	Considerations
Fibrates or Fibric Acids Reduces liver lipogenesis	Fenofibrate & derivatives Multiple brand formulations	30-160 mg 1x daily Please refer to individual package insert for dosing	**20-50%**	Lowers LDL 5-20% Raise HDL 10-20% GI side effects, myopathy Avoid w/ severe renal or hepatic disease
	Gemfibrozil / Lopid*	600mg 2x daily		
Nicotinic Acid Raise HDL/Lower TG	Niacin (immediate release)*	1.5- 3 gms	20-50%	Raise HDL 15-35% Flushing, hyperglycemia, hepatoxicity
	NiaSpan (extended release) Niacin (sustained release)	1-2 gms		
Omega 3 Fatty Acid	Omega 3 Acid/ Lovaza	4 gm a day	45%	Raise HDL 9% - Primary use for TG > 500

**indicates medication is available in generic form.*

Antihypertensive Medications

ACE and ARBs are preferred therapy for diabetes with hypertension and albuminuria – If B/P not at goal with either of these agents, add a diuretic or other class. Do not use during pregnancy or in persons w/ renal or hepatic dysfunction. Start w/ low dose, gradually increase. If med in class not tolerated, try a different med in same class. Don't take ACE and ARBs together. For those treated with an ACE inhibitor, angiotensin receptor blocker, or diuretic, monitor serum creatinine/estimated glomerular filtration rate and potassium levels at least annually. ADA Standards CV Disease Risk Management

Class / Action	Generic / Trade Name	Usual Daily Dose Range	Frequency	Considerations
ACE Inhibitors Angiotensin Converting Enzyme **Action -** Block the conversion of AT-I to AT-II. Also stimulates release of nitric oxide causing vasodilation.	benazepril / Lotensin†	10 – 40 mg	1 x a day	Try to take the same time each day. **Side effects**: Can cause cough (due to increased bradykinin) may cause hypotension. Monitor: changes in potassium and renal function **†**These meds are also available as a combo w/ low dose HCTZ (hydrochlorothiazide). **‡**These meds are also available as a combo w/ CCB (calcium channel blocker) usually amlodipine
	captopril /Capoten*†	12.5 - 150 mg	2-3 x a day	
	Enalopril/ Vasotec*†	2.5 - 40 mg	1-2 x a day	
	Fosinopil / Monopril†	10- 40 mg	1 x a day	
	Lisinopril *† Prinivil, Zestril	10 – 40 mg		
	Ramipril / Altace*†	2.5 – 20 mg		
	Moexipril / Univasc†	3.75 - 30 mg		
	Perindopril/Aceon‡	2-16 mg		
	Perindopril/ Indapamide combo (Coversyl)	2 - 8 mg 0.625 - 2.5 mg		
	Quinapril /Accupril†	5 – 80 mg		
	Trandolapril/ Mavik	1.0 – 4 mg		
	Trandolapril/ Verapamil combo (TARKA)	1-4 mg 180 to 240 mg		
ARBs -Angiotensin Receptor Blockers **Action -**Block AT-I receptor which reduces aldosterone secretion and vasoconstriction	Azilsartan/Edarbi	40 - 80 mg	1 x daily	Try to take the same time each day. **Side effects**- may cause hypotension**.** Monitor: changes in potassium and renal function **‡†**These meds are also available as a combo w/ low dose HCTZ (hydrochlorothiazide) or w/ CCB (calcium channel blocker) usually amlodipine. For Sacubitril/Valsartan (Entresto): 36hr washout period required if previously on ACE
	Azilsartan/ Chlorthalidone combo (Edarbyclor)	40 mg 12.5 - 25 mg		
	Candesartan/Atacand†	8 – 32 mg		
	Eprosartan/Teveten†	400 - 600 mg		
	Irbesartan/ Avapro†	75 – 300 mg		
	Losartan / Cozaar*†	25 – 100 mg		
	Olmesartan / Benicar†‡ Tribenzor (triple combo)	20 – 40 mg		
	Telmisartan / Micardis	20 – 80 mg		
	Valsartan / Diovan†‡ Exforge HCT(combo)	80 – 320 mg		
Inhibits neprilysin	Sacubitril/Valsartan (Entresto)	24/26-97/103 mg	2x daily	
	Valsartan/Nebivolol (Byvalson) (combo)	80 mg 5 mg		

**indicates medication is available in generic form.*

Class / Action	Generic / Trade Name	Usual Daily Dose Range	Frequency	Considerations
DRIs - Direct Renin Inhibitors -	Aliskiren / Tekturna†	150 – 300 mg	1 x daily	Generally, well tolerated. †These meds are also available as a combo w/ low dose HCTZ (hydrochlorothiazide).

Beta Blockers are commonly prescribed as an add-on to other B/P meds for people with DM. Beta Blockers are beneficial for persons w/ concurrent cardiac problems and prevention of recurrent MI and heart failure. Caution in DM since Beta Blockers can cause hyperglycemia and mask hypoglycemia induced tachycardia (but do not block hypoglycemia related dizziness and sweating). Monitor B/P, heart rate, lipids and glucose.

Beta Blockers *β1- Selective* **Action:** Blockade β1 receptors & reduce cardiac output & kidney renin activation.	Acebutolol / Sectral*	200 - 1200 mg	2 x daily	Side Effects: Usually CNS related including sedation, dizziness, lightheaded . Watch for bradycardia, hypotension, depression and sexual dysfunction. Check heart rate each visit, adjust dose if HR <50. Can cause heart block – review package insert for drug-drug interactions. Watch for exercise intolerance. When stopping beta blockers, taper dose gradually. Use cautiously at lowest dose. †These meds are also available as a combo w/ low dose HCTZ (hydrochlorothiazide).
	Atenolol / Tenormin*	25 – 100 mg	1 x daily	
	Atenolol with Chlorthalidone/ Tenoretic	50 -100 mg 25 mg	1 x daily 1 x daily	
	Betaxolol / Kerlone	5 – 20 mg	2 x daily	
	Bisoprolol/ Zebeta†	2.5 – 20 mg		
	Metoprolol tartate/Lopressor*†	25 – 400 mg	1 x daily	
	Metoprolol succinate / Toprol XL	25 - 200 mg		
	Nebivolol/Bystolic	5 to 40 mg		
	Nebivolol with Valsartan/ Byvalson	5 mg 80 mg		
Beta Blockers *Non-Selective* **Action**: Blockades β1 & β2	Nadolol / Corgard*	40 - 120 mg	1 x daily	
	Nadolol with Bendroflumethiazide	40-80 mg 5 mg		
	Pindolol / Visken	10 – 60 mg	2 x daily	
	Propanolol / Inderal*	40 – 160 mg	2 x daily	
	Inderal LA (extended)	60 – 180 mg	1 x daily	
	Timolol / Blocadren*	10 – 60 mg	2 x daily	
Combined α- and β- Blockers	Carvedilol / Coreg	6.25 – 50 mg	2 x daily	Same precautions as beta blockers.
	Coreg CR	20 – 80 mg	1 x daily	
	Labetalol / Normodyne*	100 – 2400 mg	2 x daily	

Diuretics are often used as adjunct therapy. Obtain baseline glucose levels, B/P, electrolytes, uric acid, glucose and lipids when starting & periodically. May need supplementation w/ magnesium, potassium.

Class / Action	Generic / Trade Name	Usual Daily Dose Range	Considerations
Thiazide Diuretics **Action:** cause diuresis and decrease vascular resistance. (Many meds combined with this class)	**Hydrochlorathiazide (HCTZ)*** **HydroDIURIL** **Microzide**	12.5 – 25 mg Most frequently prescribed	1 x daily in am with or w/out food **Side effects**: lyte imbalances; hypokalemia, hypomagnesemia, hyperuricemia, hyperglycemia, hyperlipidemia and hyper/hypocalcemia. S/S include muscle cramps, fatigue, dizziness and cardiac arrhythmias .
	Chlorthalidone / Clorpres*	12.5 – 25 mg	
	Metolazone / Zaroxolyn*	2.5 – 20 mg	
	Indapamide / Lozol*	1.2 – 2.5 mg	

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Class / Action	Generic / Trade Name	Usual Daily Dose Range	Considerations	
Loop Diuretics (resistant HTN)	Furosemide/Lasix*	20 – 600 mg 2x day	Side Effects as above, but more intense. Need K^+ supplement. Monitor renal function and potassium levels. Used primarily for advanced heart failure management.	
	Torsemide / Demadex*	2.5 – 200 mg 1x day		
	Bumetanide / Bumex*	0.5 – 10 mg 2 x day		
Potassium Sparing Diuretics	Amiloride / Midamor	5 – 20 mg	1 x day	Usually combined with diuretic. Monitor renal function and potassium levels.
	Triamterene / Dyrenium	37.5 – 75 mg	1 x day	
Mineralocorticoid receptor blockers	Finerenone/Kerendia (nonsteroidal)	10-20 mg	1 x day	Monitor renal function and potassium levels See more info here
	Spironolactone / Aldactone*	25 – 100 mg	1-2 x day	
	Eplerenone / Inspra	50 - 100 mg	1 -2 x day	

Calcium Channel Blockers are usually second- or third-line BP med for diabetes, since they have less impact on CVD. They may also be used for those who can't tolerate ACE or ARB Therapy.

Class / Action	Generic / Trade Name	Usual Daily Dose Range	Frequency	Considerations
Calcium Channel Blocker *Nondihydropyridine* Relaxes coronary blood vessels to decrease heart rate and cardiac output.	**Diltiazem immediate release formulation***	30 – 360 mg	4 x day	**Monitor** BP, heart rate, liver enzymes and cardiac function a baseline and periodically. Take at the same time each day (with meals if possible). Take in evening if experience drowsiness. **Side Effects**: Watch for cardiac conduction abnormalities, bradycardia, CHF and edema. Can cause peripheral edema and constipation. Metabolized through CYP3A4, so review package insert for drug and food interactions (ie grapefruit).
	Diltiazem twice daily formulation*	120 – 480 mg	2 x day	
	Diltiazem once daily formulation* Cardizem CD Tiazac Dilacor, Diltia		1 x day	
	Verapamil immediate release* Calan	80 -480 mg	3 x day	
	Verapamil sustained release* Calan SR, Veralan	120 mg – 480 mg	1 -2 x day	
	Verapamil extended release* Covera-HS Verelan PM	120 – 480 mg 100 – 400 mg	1 x day	
Calcium Channel Blocker – *Dihydropyridine* Causes vasodilation and decreases peripheral vascular resistance.	Amlodipine/Norvasc	2.5 – 10 mg	1 x day	
	Felodipine / Plendil	2.5 – 10 mg	1 x day	
	Isradipine controlled release DynaCirc CR	2.5 – 10 mg	1 x day	
	Nicardipine sustained release / Cardene SR	30 – 60 mg	2 x day	
	Nifedipine long-acting* Adalat CC /Procardia XL	30 – 120 mg	1 x day	
	Nisoldipine / Sular	10 – 40 mg	1 x day	

α1 – Receptor Blockers - Often used for pts with DM & benign prostatic hypertrophy (BPH).

α1 – Receptor Blockers	Doxazoxin/Cardura*	1 – 8 mg	1 x day	Take at bedtime to reduce risk of postural hypotension/syncope.
	Prazosin / Minipress*	2 – 20 mg	2 - 3 day	
	Terazosin/ Hytrin*	1 – 10 mg	1 – 2 day	
Selective 1a	Silodosin/ Rapaflo	8 mg	1 x day	
	Alfuzosin/Uroxatral	10 mg	1 x day	
	Tamsulosin/Flomax	0.4 mg	1 x day	

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α2 agonists- Not usually first line due to side effects. Effective w/ renal disease, does not compromise renal function.				
α2 agonists – reduces sympathetic tone from CNS to lower B/P	Clonidine / Catapres*	0.1 to 0.8 mg	2 x day	Side effects: sedation, dry mouth, bradycardia orthostatic hypotension, impotence. Do not stop abruptly, can cause hypertensive crisis.
	Methyldopa / Aldomet*	250 – 1000 mg	2-3 x day	

PCSK9 Lipid Lowering Medications

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PCSK9 Inhibitors Lipid Medications

Proprotein convertase subtilisin/kexin type 9

	Alirocumab (Praluent)	Evolocumab (Repatha)
FDA-approved indications	• Primary hyperlipidemia (HLD) • Homozygous familial hypercholesterolemia (HoFH) • Secondary prevention of cardiac events	
Dosing	• **HoFH**: 150 mg SC q2 weeks • **HLD or secondary cardiac prevention**: 75 mg SC q2 weeks or 300 mg SC q4 weeks; if adequate LDL response not achieved, may increase to max of 150 mg q2 weeks	• **HoFH**: 420 mg SC q4 weeks; may increase to 420 mg q2 weeks if meaningful response not achieved in 12 weeks • **HLD or secondary cardiac prevention**: 140 mg q2 weeks or 420 mg q4 weeks
Dosage forms	• Auto-injector 75 mg/mL or 150 mg/mL	• Repatha Sure Click (auto-injector) 140 mg/mL • Repatha Pushtronex System (single use infusor with pre-filled cartridge) 420 mg/3.5 mL – administered over 9 minutes
Storage	• Store in refrigerator in outer carton until used • Once used, keep at room temperature, use within 30 days	
Injection clinical pearls	• Do not shake or warm with water • Administer by SC injection into thigh, abdomen, or upper arm • Rotate injection site with each injection	
Drug interactions	• No known significant interactions	
Monitoring parameters	• Lipid panel before initiating therapy, 4-12 weeks after initiating, and q3-12 months thereafter	
Side effects	• Injection site reaction (4-17%) • Hypersensitivity reaction (9%) • Influenza (6%) • Myalgia (4-6%) • Diarrhea (5%)	• Nasopharyngitis (6-11%) • Upper respiratory tract infection (9%) • Diabetes mellitus (9%) • Influenza (8-9%) • Injection site reaction (6%) • Myalgia (4%)