

PHARMACOLOGY

SUMMARY



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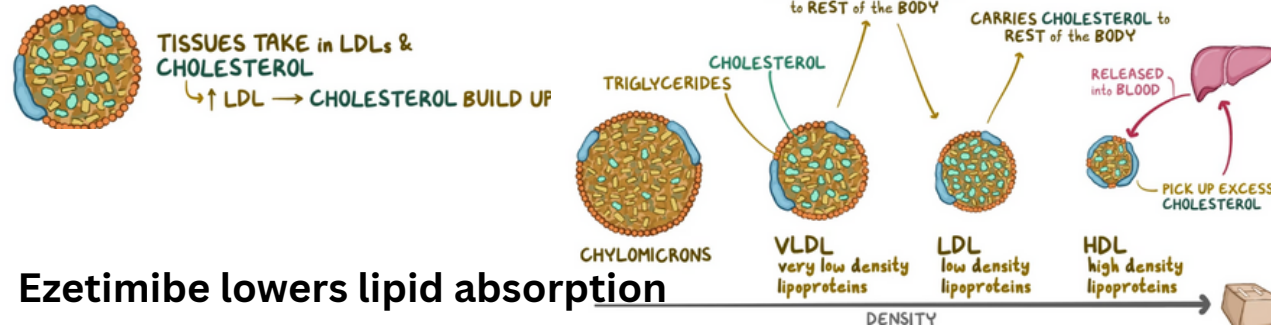
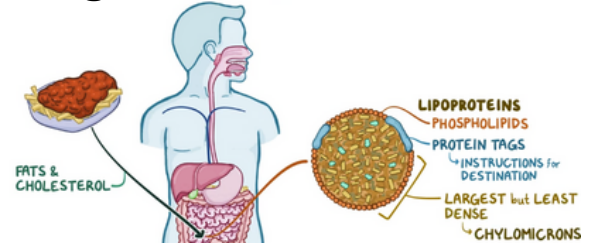
Anti-hyperlipidemic drugs

↓ COMPLICATIONS associated w/ CARDIOVASCULAR DISEASE

- ~ STROKES
- ~ HEART ATTACKS
- ~ PERIPHERAL VASCULAR DISEASE

treatment of atherosclerosis to decrease risk of other CV diseases
 increase HDL has questionable effect (no value like placebo)
 Lifestyle Change is Not Widely Accepted Among Jordanians

1. fats and cholesterol are absorbed in the small intestine
2. chylomicrons are released into the lymphatic system
3. liver can also synthesize intrinsic cholesterol
4. then packed into VLDL
5. then LDL then HDL



Ezetimibe lowers lipid absorption

STATINS

decrease LDL in hypercholesterolemia & combined

great efficacy, best drug

(HMG CoA) inhibitors = stop cholesterol synthesis

Increase in LDL receptors

side effect:

1. high doses = myopathy
2. abnormalities in liver
3. teratogenic

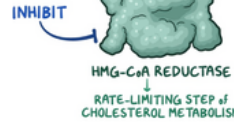


- ~ SIMVASTATIN
- ~ LOVASTATIN
- ~ PRAVASTATIN
- fluvastatin

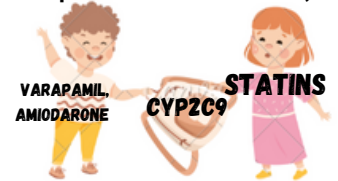
- ~ ATORVASTATIN
 - ~ ROSUVASTATIN
- MORE POTENT great efficacy

Cerivastatin side effects

- ~ ↓ LDL
- ~ ↑ HDL
- ~ ↓ CHOLESTEROL



grapefruit juice increase plasma levels of lova, sim, atro
 high CYP3A4 decrease plasma levels of lova, sim, atro



Fibrates

decrease VLDL in hyperlipemia & combined

activates (PPARs) & lipase = decrease in VLDL
 if combined with statins ↑ risk of myopathy

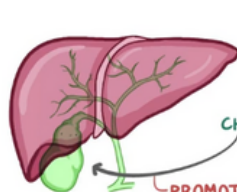
MYOSITIS



- * GI SYMPTOMS & RASHES
- * RHABDOMYOLYSIS
- STATINS ALSO CAUSE
- COMBINED → RISK ↑

SIDE EFFECTS

- * BILE ACID RESINS
- ↳ GALLSTONE FORMATION
- ↳ USED w/ FIBRATES
- ↳ RISK of GALLSTONES

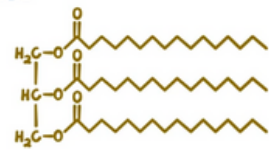


FIBRATES ↓ ACTIVITY of CHOLESTEROL 7-ALPHA-HYDROXYLASE

CHOLESTEROL → BILE ACID

PROMOTES FORMATION of GALLSTONES

LITHIASIS



EFFECTIVE at ↓ TRIGLYCERIDE LEVELS

GEMFIBROZIL

BEZAFIBRATE

FENOFIBRATE

Bile acid-binding resins

↳ ↓ **CHOLESTEROL LEVEL in BLOOD**

less efficient

Cholestyramine and colestipol

trigger the conversion of cholesterol

side effects :

1. constipation and nausea
2. A,D,E, and K absorption impair
3. interact with Tetracycline, Digoxin, Warfarin, Aspirin(6 hours in-between)

Niacin

cause high increase in HDL by inhibiting lipolysis

SIDE EFFECTS

~ "NIACIN FLUSH"

- * RED, FLUSHED FACE
- * PRURITUS

GI irritation

Peptic ulcer activation

hyperglycemia and hyperuricemia



Antiarrhythmic Drugs

arrhythmia = ectopic pacemaker

ischemia or hypoxia or injury= fired foci in atrium = generate impulse =

send to AV node = tachycardia = less filling = fibrillation = death

Atrial fibrillation , is not life threatening , cause AV node works as ectopic pacemaker causing HB , so we should not block AV to not let impulse go to ventricles .

but we need to handle AV with class 2 (beta blockers , Ca blockers) to decrease its conductivity

SUPRAVENTRICULAR + ATRIUM FIBRILLATION + ATRIUM FLUTTER = CLASS 2 (BETA BLOCKERS) , CLASS 4 (CA BLOCKERS)

Class II

Class IIa = beta blockers "lol" , causing decrease in automaticity , atrium abnormality

side effects : mask hypoglycemia , bradycardia , Cold extremities

MISCELLANEOUS ANTIARRHYTHMICS

DIGOXIN

Class IIc

Muscarinic M2 receptor activators

AV node inhibition (vagal stimulation) & Positive inotropic

side effects : Gynecomastia , visual, GI

ADENOSINE

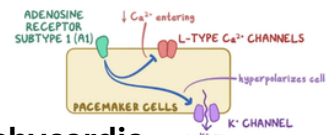
Class IIe

Adenosine A1 receptor activators

use = Acute termination of AVN tachycardia

Adenosine exerts a negative chronotropic & dromotropic

side effects : Sinus bradycardia, sinus arrest or AV block



Class I

Na⁺ channel blockers

Class Ia

blocks Na + K channels = prevent Na influx & K efflux
 longer phases (depolarization & repolarization), longer qt on ECG
 increase ERP and APD (refractory + action duration)
 so don't give it with drugs cause QT elongation

- * QUINIDINE
- * PROCAINAMIDE
- * DISOPYRAMIDE

SLOWER DEPOLARIZATION
 ↓
 SLOWER CONDUCTION of ACTION POTENTIAL
 ↓
 SLOWER HEART RATE

tinnitus ← **Quinidine** → Cinchonism
 Torsades de pointes
 QT interval prolongation

Procainamide BETTER

Class Ib

shortens both APD and ERP
 contraindicated, unless arrhythmia cause is QT elongation
 weak Na block, Side effects: CNS effects

LIDOCAINE

Class Ic

Strongest Na blockage
 normal ERP and APD
 Ventricular tachyarrhythmias if others are resistance

FLECAINIDE ~~NO~~
PROPAFENONE BETTER

✓ LONG QR
 ✗ LONG QT

Class III

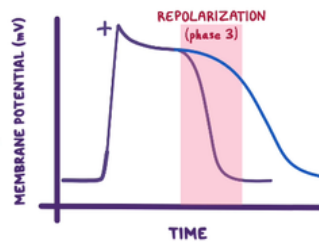
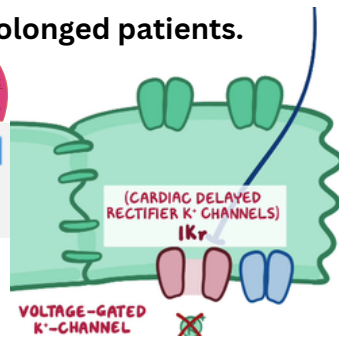
K⁺ channel blockers

side effects: Torsades de pointes with QT prolongation

not given with QT prolonged patients.

Examples: nonselective (**ambasilide, amiodarone**) and selective (**dofetilide, ibutilide, sotalol**) blockers

drug of choice for children, block Ca & Na too.



Class IV

drugs blocking Ca²⁺ entry

- NON-DIHYDROPYRIDINES
- * CLASS IV ANTIARRHYTHMICS
- ~ VERAPAMIL
- ~ DILTIAZEM

NEW LIPID LOWERING DRUGS

reduction of cholesterol synthesis

Bempedoic acid

selective antagonist of ACLY.

prodrug, activated in liver by very-long-chain acyl-CoAsynthetase-1

higher urea + decrease hemoglobin, higher gout, low diabetic (hypoglycemia)



evolocumab and alirocumab

monoclonal antibodies

inhibition of PCSK9 = increase in LDLR number, decrease in plasma LDL-C

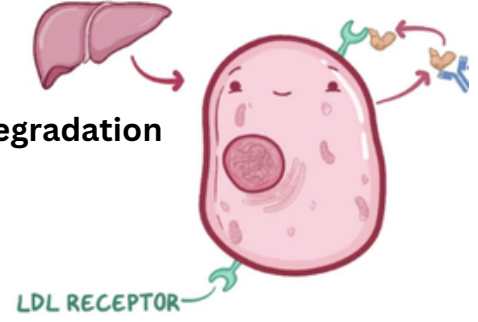
Side effect: flu like

Inclisiran

GalNAc transport this drug to cause RNA silencing then PCSK9 degradation (siRNA)

better than others

no side effects



ApoC-III inhibitor

inhibitor of lipoprotein lipase causing decrease in (VLDL) and chylomicron particles
APOC3 mutation = less 40% triglycerides +40% lower CVD

VOLANESOREN

antisense oligonucleotide (ASO) targeting apoC3 mRNA

adult patients with FCS "familial chylomicronemia syndrome"

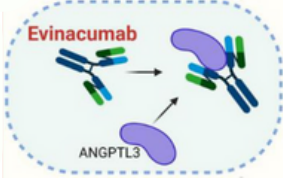
side effects : thrombocytopenia and injection-site reactions

ANGPTL3 inhibitor

Inhibition of ANGPTL3= decline in TG, LDL-C and HDL-C

EVINACUMAB

monoclonal antibody
Side effect: flu like
Blocking antibody



VUPANORSEN

antisense oligonucleotide (ASO)



اللهم إني أسألك أنك العليم الكريم أن توفقنا لما تحبه وترضى،
وأن تكتب لنا النجاح والفلاح والتوفيق في تحصيل كل علم
نافع، اللهم مالك السماوات والأرض ومنزل الكتاب لا تنزع
العلم من بيننا وارفعنا به، وارزقنا يا الله فهم أنبيائك وحفظ
الملائكة ورسلك