1. Cytomegalovirus (CMV)

* latent virus that is activated in cases of immunosppression
* Gabciclovir ----- **selective** activation by triphspholartion firstly by virus kinase then host kinase ------- activated compound **inhibit the viral DNA polymerases** caused termination of viral DNA elongation
* Resistance ✅ with long term use (mutation in the host kinase)
* IV , PO (orally) , intraocular implant
* related to **creatinine clearance**
* advers effect : myleosuppression / peripheral neuropathy/ CNS toxicity / hepatotoxicity/ carcinogenic , embryotoxic/ aspermatogenesis

2.Human immunodeficiency viurs

*combination therapy (3-4 antiretroviral agent--- standard of cure)

	MoA	Side effect	Example
Nucleoside and Nucleotide reverse transcriptase inhibitors (enterDNA)	*Competitive inhibiton of HIV-1 reverse transcriptase (no DNA formation from RNA) *premature chain termination due to inhibition of binding with incoming Nucleotide	1.mitochodrial toxicity (inhibition of mitochondrial DNA polymerase gamma 2.fatal lactic acidosis 3. hepatic steatosis 4. increased risk of myocardial infraction (MI)	***Abacavir*** (guanosine analog) # other side effect 1.Hypersensitivity reaction (test HLA-B*5701 allele before use If + ❌ don't us If - ✅ use 2. Pancreatitis 3. elevation of aminotransferases and creatine kinase level(muscle injery) 4. Respiratory symptoms(dyspnea, pharyngitis, cough 5.symptoms in the first 6 week of therapy (fever vomiting diarrhea and anorexia
Nonnucleoside reverse transcriptase inhibitors (don't enter in DNA synthesis) *not require phophorylation to be active *Metabolized bu CYP3A4 -→ drug -drug interactions	*bind directly to HIV-1 reverse transcriptase –--- allosteric inhibition of RNA and DNA dependant DNA polymerase	1. GI intolerance 2. Fatal serious rash (Steven Johnson syndrome SJ) –--- toxic epidermal necrolysis	***Delavirdine*** Adverse effect ; Skin rash in 40% of patient during 1-3 first week Erythem multiform + SJ (rare) Elevated serum aminotransferase Note; Pregnancy should be avoided Metabolized by Cyp3A and CYP2D6 and also inhibits CYP3A4 and CYP2C9 → drug interactions
Protease inhibitors *during later stages of HIV growth cycle *active against HIV1,2 *they do not need intracellular activation *Metabolized by CYP3A4	Inhibit post translational cleavage of polyproteins , resulting in production of immature noninfectionus viral particles	A syndrome of redistribution and ,accumulation of body fat resulting in central obesity, dorso-cervical fat enlargement (buffalo hump), peripheral and facial wasting, breast enlargement, and a Cushingoid appearance has been observed with the use of these drugs *elevated LDL and triglycerides, hyperglycemia and insulin resistance (except Atazavir)	***Atazanavir*** Adverse effect ; 1.diarrhea ,nausea and vomiting 2.peripheral neuropathy 3.prolongtion of PR interval and [QTc intarval (very arrhythmogenic→ fatal tachycardia 3. Indirect hyperbilirubinemia and junduce (due to inhibition of UGT1A1) Glucuronidation enzyme insulin resistanceواهم شغلة ما ننسى انه ما بعمل
Fusion inhibitor (***Enfuvirtide***)	Synthetic peptide binds to gp41 subunits of the viral envelope preventing the conformation change required for the fusion of the viral and cellular membrane	1.injection site reactions Hypersensitivity 3.eosinophilia 4.Increased rate of bacterial pneumoni	Note *administered by SC injection *eliminated by proteolytic hydrolysis
* Integrase strandvtransfer inhibitors (***Raltegravir***)	*it inhibits strand transfer ,thus interfering into the chromosomes of host cells	GI symptoms Increased creatine phosphokinase	Note *pyrimidine analog that bind integrase *integrase is a viral enzyme essential to the replication of both *polyvalent cations(ca+2, Mg+2 ,Fe+2) May bind the drug and interfere with its activity

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Antiplatelet drug → (inhibite platelets aggregation)

*normally platelets provide the initial hemostatic plug at the site of vascular injury and participate in atherosclerosis
*Used for : secondary prophylaxis and management of myocardial infarction & is ischemic stroke (within 2 h of onset)
* administered as adjuncts to thrombolytic therapy along with heparin to maintain perfusion and limit size of infarction

Classification	MOA	Note	Side effect	Therapeutic use
1.cyclooxygenase inhibitors (***Aspirin***)	***Irreversible** inhibitors (acetylation of active site) of cyclooxygenase of platelets→blocking the production of TXA2 (TXA2 → vasoconstriction + platelets aggregation)	*given once **a day** at **low** doses ✅ Higher dose ❌ - →inhibition of PGI2		
2. PGI3 generation (Eicosapentaenoic acid)	*generates 1.PGI3 (effective anti aggregation agent like PGI2) 2. TXA3 (is much less active than TXA2)	Unsaturated fatty acid (omega 3) in cold water fish		
3. ADP receptor blockers (Clopidogrel, Prasugrel, Ticlopidine)CTP	***Irreversibly** block the ADP P2Y12 receptor on platelets→ inhibit ADP-induced expression of platelet membrane GpIIb/ IIIa receptor and fibrinogen binding to activated platelets [prevents formation of platelet plug & clot retraction]	*Clopidogrel→ prodrug→ requires activation via cytochrome p450 (less side effect other than) *need 4 days to work *full effectv(10 day)	Bleeding 5% GI Intolerance 20% Sever Neutropenia 1% TTP Cholesteric hepatitis	1.patient requires aspirine but can't take it (myocardial infarction, unstable angina pectoris, transient ischemic attacks, ischemic strokes) 2. Combination with aspirine→ coronary stents
GpIIb/IIIa receptor blockers Abciximab: Humanized monoclonal antibody against the receptor Eptifibattide: Fibrinogen analog Tirofiban: Similar to eptifibattide but molecule عدد حروف الكلمة اقل اذن أصغر		*normally function as receptor mainly for fib, vitronectin also for fibronectin and VWf (final common pathway for platelets aggregation)		Used in acute coronary syndrome parenterally
Dipyridamole (vasodilater)	*inhibits platelet function by inhibiting adenosine uptake and cGMP phosphodiesterase activity	Di (not alone) No beneficial effect if used alone → with 1.aspirin → prevent cerebrovascular ischemia 2.Warfarin → primary prophylaxis of thromboemboli in patient with prosthetic heart valves		
Cilostazol	*phosphodiesterase inhibitor→ promotes vasodilation and inhibition of platelet aggregation			*treat intermittent claudication