- Nifedipine: 10, 20, 30 mg
  Epilat, Epilat retard, adalat, adalat LA, …etc

- Verapamil: 40, 80, 120, 240 mg
  Isoptin, veratens, cardiomil SR, ….etc

- Deltiazem: 60, 90, 120, 200, 240, 300 mg
  Altiazem, delay-tiazem SR, …etc

I. *High ceiling loop diuretics: [the most potent diuretics]*

- ***Mechanism of action:***
  - Loop diuretics act on the Na^+-K^+-$2Cl^-$ cotransporter in the thick ascending limb of the loop of Henle to inhibit sodium and chloride reabsorption.
  - This is achieved by competing for the Cl^- binding site.
  - Because magnesium and calcium reabsorption in the thick ascending limb is dependent on sodium and chloride concentrations, loop diuretics also inhibit their reabsorption.
  - By disrupting the reabsorption of these ions, loop diuretics prevent the urine from becoming concentrated and disrupt the generation of a hypertonic renal medulla.
  - Without such a concentrated medulla, water has less of an osmotic driving force to leave the collecting duct system, ultimately resulting in increased urine production.
  - Loop diuretics cause an increase in the renal blood flow by this mechanism. This diuresis leaves less water to be reabsorbed into the blood, resulting in a decrease in blood volume.
  - The collective effects of decreased blood volume and vasodilation decrease blood pressure and edema.
- ***Medical uses:***
  1. Heart failure
  2. Hypertension
  3. Liver cirrhosis
  4. Renal impairment & nephritic syndrome
- ***Members of the group and trade names:***
  1. Frusemide: اشهرهم واكثرهم استخداما

  - Most famous trade name is **lasix 40mg** (last six hrs. regarding duration of action)
  - دائما لا توصف مدرات البول للمريض في المساء لانه مش هينام
  - الجرعة المعتادة للازكس قرص صباحا على الريق او قرص صباحا وقرص عصرا حسب الحال
  - في اقراص من اللازكس تركيزها ٥٠٠ مجم ودي بتستخدم في الحالات الحرجة في الرعايات
  - بلاش تستخدم اللازكس امبول في انك تنزل الضغط العالي بتاع العيان في الاستقبال واستخدم قرص كابوتن تحت اللسان
  - نظرا لان اللازكس كغيره من مدرات البول بيقلل نسبة البوتاسيوم في الدم فبيتم تعويض ده بعدة طرق
    اما اضافة الداكتون معاه عشان نحافظ على البوتاسيوم ونزود قوة ادرار البول
    Potassium M syp or slow-K 600mg او عن طريق استخدام الادوية اللي بتزود الجسم بالبوتاسيوم زي
    او عن طريق استخدام اللازكس المضاف عليه بوتاسيوم زي
    Octosemide-K (frusemide 40mg + KCL 600mg)

Drugs used in hypotension

لازم قبل ما تستخدم اي دوا من الادوية دي ان العيان بيعاني من الضغط الواطي لان في ناس بيبقى ضغطهم الطبيعي انه واطي خاصة في البنات
وكمان اتاكد ان العيان ضغطه واطي في كذا قياس مش من مرة واحدة اقول ده عيان ضغطه واطي
وزي ما الجملة الشهيرة بتقول **No symptoms no treatment**

كمان مهم جدا انك تتاكد من سبب ان ضغط العيان واطي يعني لو في مرض معين نعالجه او لو بياخد دوا معين نوقفة والا لو اديت علاج يرفع الضغط من غير ما تعالج السبب هتكون بتعالج **symptomatic**

- ***Heptaminol:***
  - ***Mechanism:***
    1. Strengthen the systolic contraction of the myocardium
    2. Peripheral vasoconstriction
    3. Increase coronary blood flow
  - ***Preparations:*** **Corasore 150mg tab And drops**

- ***Etefrine HCl:***
  - ***Mechanism:***
    1. Sympathomimetic agent, has high affinity for alpha and beta-2 receptors
    2. Increase cardiac contractility >> ++ stroke volume
    3. ++ venous pressure
  - ***Preparations:***

1. **Effortil 5mg tab and 7.5mg drops**
   (1-2 tab tds & 10-20 drops tds)

2. **Vascon 5mg tab and vascon 10mg drops**

- ***Warfarin:***
  - **Mechanism of action**
    - Warfarin inhibits the vitamin K-dependent synthesis of biologically active forms of the calcium-dependent clotting factors II, VII, IX and X, as well as the regulatory factors protein C, protein S, and protein Z

  - ***Medical uses:*** as 2ry prevention for further thrombosis in thrombotic diseases
    1. AF & artificial valves
    2. MI
    3. DVT
    4. Pulmonary embolism

  - Preparations:
    - **Marevan 1,3,5 mg**

الالوان مهمة امجم بني ٣مجم ازرق ٥مجم بينك

    - Starting dose usually 5mg once daily
    - Maintenance dose is according to the target INR which is different according to the underlying condition
    - The usual target of INR is 2-3 in many cases

  - ***Side effects:***
    1. The most famous is hemorrhage
    2. Cross the placental barrier so it is contraindicated during pregnancy
  - ***Interactions:***
    1. Leafy vegetables which is rich in vitamin K antagonise marevan making the adjustment of the dose very difficult
    2. Metronidazole and macrolides potentiate its action

- ***Preparations:***
  # loading dose is 300mg then one tab of 75mg once daily
  1. **Plavix 75mg 28 tab** (205 L.E.)
  2. **Stroka 75mg 30 tab** (199 L.E.)
  3. **Thrombo 75mg 30 tab** (144 L.E.)
  4. **Clopex 75mg 30 tab** (60 L.E.)
  5. **Myogrel 75mg 10 tab** (48 L.E.)
  6. **Sigmagrel 75mg 20 tab** (20 L.E.)

يعتبر البلافكس من احسن الادوية في المجموعة في العراق من حيث الاكشن بس يعتبر سعره هو المعوق الوحيد لاستخدامه طبعا في فروقات في السعر بين الاسماء التجارية لكن يظل البلافكس هو الاحسن في باقي الاسماء

- ***Side effects:***
  1. Severe neutropenia
  2. TTP
  3. Hemorrhagic disorders specially if combined with other antiplatelets like aspirin
  4. GI disturbance
  5. Rash
  6. Respiratory (infrequent): Upper respiratory infections, rhinitis, shortness of breath, cough
  7. Cardiovascular: chest pain, edema (generalized swelling)
  8. Thrombocytopenia (reduction of platelets, 0.2% severe cases as compared to 0.1% under aspirin)

> ***N.B. In November 2009, the FDA announced that clopidogrel should be used with caution in patients on proton pump inhibitors such as omeprazole and esomeprazole.***

ومش هنتكلم كتير عنهم لان استخدامهم بيكون بحرص شديد جدا وعن طريق طبيب متخصص في امراض القلب ولكن في جدول جميل جدا مجمعهم كلهم وقايل اشهر استخداماتهم من موسوعة ويكيبيديا

Class	Known as	Examples	Mechanism	Clinical uses in cardiology [1]
Ia	fast-channel blockers-affect QRS complex	• Quinidine • Procainamide • Disopyramide	(Na^+) channel block (intermediate association/dissociation)	• Ventricular arrhythmias • prevention of paroxysmal recurrent atrial fibrillation (triggered by vagal overactivity) • procainamide in Wolff-Parkinson-White syndrome
Ib- Do not affect QRS complex		• Lidocaine • Phenytoin • Mexiletine • Tocainide	(Na^+) channel block (fast association/dissociation)	• treatment and prevention during and immediately after myocardial infarction, though this practice is now discouraged given the increased risk of asystole • ventricular tachycardia • atrial fibrillation
Ic		• Flecainide • Propafenone • Moricizine	(Na^+) channel block (slow association/dissociation)	• prevents paroxysmal atrial fibrillation • treats recurrent tachyarrhythmias of abnormal conduction system • Contraindicated immediately post-myocardial infarction.
II	Beta-blockers	• Propranolol • Esmolol • Timolol • Metoprolol • Atenolol • Bisoprolol	Beta blocking Propranolol also shows some class I activity	• decrease myocardial infarction mortality • prevent recurrence of tachyarrhythmias
III		• Amiodarone • Sotalol • Ibutilide • Dofetilide • Dronedarone • E-4031	K^+ channel blocker Sotalol is also a beta blocker [2] Amiodarone has Class I, II, III & IV activity	• In Wolff-Parkinson-White syndrome • (sotalol:) ventricular tachycardias and atrial fibrillation • (Ibutilide:) atrial flutter and atrial fibrillation
IV	slow-channel blockers	• Verapamil • Diltiazem	Ca^{2+} channel blocker	• prevent recurrence of paroxysmal supraventricular tachycardia • reduce ventricular rate in patients with atrial fibrillation
V		• Adenosine • Digoxin • Magnesium Sulfate	Work by other or unknown mechanisms (Direct nodal inhibition).	Used in supraventricular arrhythmias, especially in Heart Failure with Atrial Fibrillation, contraindicated in ventricular arrhythmias. Or in the case of Magnesium Sulfate, used in Torsades de Pointes.

2. Isosorbide dinitrate:
   - Usually used during the attack due to rapid action
   - **Trade names** are: **Dinitra 5,10mg tab isomack 20,40mg cap**

3. Nitroglycerin:
   - May be used during the attack or in between according to the concentration
   - **Trade names** are:
     - **Angised 0.5** (used sublingually durig the attack)
     - **Nitromack Retard 2.5,5mg cap**
     - **Nitroderm-TTS 10,15 patches**
       Deponite NT5,10 patches (1-2 patches daily)

- ***Side effects***:
  1. Severe headache (throbbing)
  2. Tolerance (use the smallest effective dose & allow a nitrate free interval about 8 hrs. daily)

ياخد قرص صباحا ومساءا من الايفوكس وما ياخدش قرص ليلا واحتمالات حدوث وجع الدبحة ضعيف جدا وحتى لو حصل ممكن ياخد قرص داينيترا تحت اللسان

- ***Drug Interactions:***
  1. Sildenafil: exaggerated VD >> syncope or myocardial infarction
  2. N-acetyl cisten & captopril with sustained release mononitrate increase the efficacy of isosorbide mononitrate and exercise time in these patients
  3. Verapamil with sustained release mononitrate >> improve left ventricular function
  4. Other CCBs with mononitrate >> orthostatic hypotension
  5. Propranolol with mononitrate >> decrease in portal blood pressure

***** Nicorandil** nitrate dervative:***

- As nitrates (venodilator) also it is arteriodilator & coronary dilator >> -- preload, -- afterload & improves coronary circulation
- R/ randil (10mg twice daily with max dose 30mg twice daily)
- used if there's no response to nitroglycerin

Hints on ischemic chest pain

- بداية ودا شيء مهم جدا جدا لازم نحط في بالنا حاجة مهمة جدا وبتتنسي مع انها شائعة جدا وهي **pain of cardiac neurosis**
- ده مشهور اكتر في البنات اللي سنهم صغير ةعادة المرافق بيقولك ان في موقف حصل زعلها فحصل كده وده بيكون مالوش علاج غير بس كلمتين للعيانة لرفع معنوياتها وخلاص ☺
- مهم جدا واول خطوة بنعملها لاي عيان داخل بيشتكي من **chest pain** وقبل اي شيء لازم اخد **good history about the pain** وده عشان اعرف هل هو **typical schemic pain** ولا مجرد حاجة نفسية ولا له سبب تاني
- وبما اننا هنركز في موضوعنا على ال **ischemic chest pain of angina or MI** فلازم نكون عارفين ايه هي مواصفات النوع ده من الم الصدر

- ***Criteria of chest pain of cardiac origin due to angina pectoris:***
  1. ***Site:*** diffuse retrosternal
  2. ***Radiation:*** shoulders, arms, forearms (specially the left side)- neck and lower jaw – less commonly back or epigastrium
  3. ***Character:*** crushing, compressing, squeezing, suffocating, heaviness
  4. ***Duration:*** several minutes (if >20 min AMI and UA should be considered)
  5. ***Precipitated by:*** stress, sexual intercourse, cold weather, heavy meals
  6. ***Relieved by:*** rest & sublingual nitrates
  7. ***Associated symptoms:***
     - Dyspnea, palpitation, dizziness
     - Sweating, nausea, vomiting
     - Angor animi
- ***Pain of unstable angina:***
  1. ***Worsening angina:***
     - increased in severity, frequency, duration
     - occurs at rest or with minimal exertion
     - pain of recent onset within 2 months
     - angina resistant to therapy
  2. ***20% of UA will pass to AMI and some consider UA as intermediate syndrome between angina and AMI so the most important drug in that phase is antiplatelet***
- ***Pain of AMI: (diagnosed by typical chest pain - typical ECG - typical enzymes)***
  1. ***Typical:*** as angina but:
     - More severe, more prolonged, more radiating
     - May occur without precipitating factor & not relieved by rest or SL nitrates
  2. ***Atypical:*** snse of indigestion, or atypical location of the pain
  3. ***Absent with*** DM i.e. autonomic neuropathy, elderly patients (silent MI)
- ***Important clues:***
  1. Anti anginal drugs are Nitrates, CCBs, BB >>> usually we start with nitrates
  2. for stable angna add BB or CCBs, if persistent anginal pain on 2 drugs apply triple therapy
  3. for variant angina add CCBs to nitrates
  4. UA the most important is antiplatelets and anticoagulants

- ***Oral hypoglycemic drugs:***

This is an overview on classes of oral hypoglycemic drugs:

-Insulin sensitizers:	**- Insulin secretagogues :**
Biguanides	Sulfonylureas
Thiazolidinediones	Non-sulfonylureas: i.e. meglitinides
-Alpha-glucosidase inhibitors	***-Dipeptidyl Peptidase-4 Inhibitors***

✓ *Biguanides: (metformin) 1st line drug of choice in ttt of type 2 DM*

- ***Mechanism of action:***
  1. Decrease blood glucose via: (it is euglycemic and don't cause hypoglycemia)
     - Decrease glucose absorption
     - Decrease gluconeogenesis
     - Increase passage of glucose into cells
  2. Improves insulin resistance
  3. Decrease appetite

- ***Indications:***
  1. Type 2 DM (Typical reduction in glycated hemoglobin (A1C) values for metformin is 1.5–2.0%)
  2. Polycystic ovary syndrome
  3. Prediabetes and gestational diabetes (controversy)

- ***Side effects:***
  1. GI disturbances including diarrhea, cramps …etc (most common)
  2. Loss of appetite
  3. Lactic acidosis
  4. Homocysteinemia
  5. Anemia due to B12 malabsorption

- ***Contraindications:***
  1. Type I DM
  2. Type II DM with severe hyperglycemia
  3. DKA
  4. Diabetes with pregnancy
  5. Surgery
  6. Severe liver or renal disease
- ***Preparation and dosage:***
  - ***Cidophage, glucophage, diaphage 500,850, 1000 mg***
  - R/ metformin 500mg tab قرص بعد الاكل ٣ مرات يوميا
  - الوحيد من ادوية السكر اللي بيتاخد بعد الاكل ولو اتاخد قبل الاكل بيزود اعراضه الجانبية على المعدة والجهاز الهضمي
- ***Interactions:***
  - Cimetidine and cephalexin increase plasma concentration of metformin

- The DPP-4 enzyme is known to be involved in the suppression of certain malignancies, particularly in limiting the tissue invasion of these tumours. Inhibiting the DPP-4 enzymes may allow some cancers to progress

✓ *Injectable Incretin mimetics:*

❖ Injectable Glucagon-like peptide analogs and agonists

- Glucagon-like peptide (GLP) agonists bind to a membrane GLP receptor.
- As a consequence, insulin release from the pancreatic beta cells is increased.
- Endogenous GLP has a half-life of only a few minutes, thus an analogue of GLP would not be practical.

a) Exenatide (also Exendin-4, marketed as Byetta) is the first GLP-1 agonist approved for the treatment of type 2 diabetes. Exenatide is not an analogue of GLP but rather a GLP agonist. Exenatide has only 53% homology with GLP, which increases its resistance to degradation by DPP-4 and extends its half-life.Typical reductions in A1C values are 0.5–1.0%.

b) Liraglutide, a once-daily human analogue (97% homology), has been developed by Novo Nordisk under the brand name Victoza. The product was approved by the European Medicines Agency (EMEA) on July 23, 2009, and by the U.S. Food and Drug Administration (FDA) on January 25, 2010.

✓ *There're many combination drugs between metformin and SU & most of the other groups to form combo tablets* ***for examples:***

- ***Amaryl-M (amaryl + metformin)***
- ***Janumet (sitagliptin + metformin)***
- ***Pioglumet (pioglitazone + metformin)***
- ***Glucovance, diavance, glimet, meburide (glibenclamide + metformin)***
- ***Engilor (glipizide + metformin)***

5. *Iron:*
   - *Trade names: hemoton, hemacaps, ferrotron, ferrosanol doudenale, …etc*
   - *Used in iron deficiency anemia, pregnancy, …etc*
   - *One cap. After the main meal*
   - *S.E. GI upset and constipation*
   - *CI with peptc ulcer*

6. *Calcium:*
   - *Trade names: calcimate, marcal, ustrade …etc*
   - *Used commonly in patents with renal diseases, pregnancy, ….etc*
   - *One cap. tds*

7. *Vitamin D:*
   - *Trade names: one alpha, bone one*
   - *Used in vit D deficiency, renal failure (lack of activation of vit D)*
   - *One tab. يوم بعد يوم*

8. *Potassium:*
   - *Trade names: potassium M syrup, slow K tabs.*
   - *Uses: with diuretics (loop, thiazide) and some renal diseases with hypokalemia, other causes of hypokalemia …etc*

9. *Vitamin C:*
   - *Trade names: cevarol, C-Retard*
   - *Uses: phosphate stones, common cold, CT diseases (vitamin c is the cement of connective tissue)*

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