

## Chapter One: Gastro-intestinal System

### 1.1-Antacids

1-Antacids are basic compounds that neutralize hydrochloric acid in the gastric secretions. They are used in the symptomatic management of gastrointestinal disorders associated with gastric hyperacidity such as dyspepsia, gastroesophageal reflux disease, and peptic ulcer disease <sup>(1)</sup>.

2-Antacids are best given when **symptoms occur (i.e. when required)** or are expected, usually between meals and at bedtime <sup>(2)</sup>.

3-Antacid **suspensions** are more effective and work more quickly than tablets (of the same type and quantity).

4-Patient should be instructed to **chew the tablets** thoroughly followed by a full glass of water to ensure maximum therapeutic effect.

5-It might be appropriate for the patient to have both; **tablet** antacid may be taken during a **day** at the **work** while **suspension** is taken at **home**.

#### 6-Interactions:

A-Antacids can affect the **absorption of a number of drugs** (via chelation and adsorption) and the majority of these interactions are easily overcome by **leaving a minimum gap of (1-2) hours between the doses of each drug**.

B-Antacids -----increase the PH of the stomach-----cause a **premature release of enteric coated tablets** or granules in the stomach rather than the intestine.

#### 7-Side effects of antacids

**A-** AL-containing antacids tend to be **constipating**, Mg-containing antacids tend to cause osmotic **diarrhea** and are useful in patients who are slightly constipated. Thus **combination** products of AL and Mg salts cause minimum bowel disturbances.

**B-** Antacids containing sod. Bicarbonate **should be avoided in patients if sodium intake should be restricted** (e.g. in patient with CHF, hypertension,.....).

8-Other drugs that may be combined with antacid formulations include **simeticone**, which acts as a defoaming agent to reduce **excess gas in the stomach**, and **alginates**, which form a gel or foam on the surface of the stomach contents thereby impeding reflux and **protecting the oesophageal mucosa from acid attack** <sup>(1)</sup>.

<b>Antacids (including those combined with simethicone, and alginate)</b>			
	<b>Scientific names</b>	<b>Trade names</b>	<b>Dosage form</b>
1	Sod. Alginate, potassium bicarbonate	<b>Gaviscon</b> <sup>(Reckitt Banckiser)</sup>	Suspension
2	Mg-Hydroxide 400mg Al-Hydroxide 400mg	<b>Maalox</b>	Chewable tablet , Suspension
3	Ca-carbonate 680mg Mg-carbonate 80mg	<b>Rennie</b>	Chewable tablet
4	Mg-Hydroxide, simethicone Al-Hydroxide	Maalox Plus	Chewable tablet , Suspension
5	Mg-trisilicate , Al-Hydroxide Na-bicarbonate ,Alginic acid	<b>Gaviscon</b>	Chewable tablet
6	Mg-Hydroxide 195mg /5mL Al-Hydroxide 220mg/5mL	<b>Maalox</b> <sup>(Sanofi-Aventis)</sup>	suspension

**Any extra notes:**

## **1.2-Proton pump inhibitors(PPIs)**

1- PPIs are the most potent inhibitors of gastric acid secretion and include **omeprazole, lansoprazole, rabeprazole, pantoprazole, and esomeprazole** <sup>(3)</sup>.

2-PPIs are used for the treatments of **gastric and duodenal ulcers**; they are also used in **combination with antibacterials for the eradication of Helicobacter pylori** (a bacteria that is common cause of ulcer) . PPIs can be used for the treatment of **dyspepsia** and **gastro-oesophageal reflux disease**. They are also used for the **prevention and treatment of NSAID-associated ulcers** <sup>(2)</sup>.

3- Regimen for the **eradication of Helicobacter pylori** usually composed of **proton pump inhibitor (PPI), clarithromycin, and either amoxicillin or metronidazole** for 10–14 days. This regimen is called (**triple therapy**) <sup>(4)</sup>.

4-They are most effective when **taken 30 to 60 minutes before meals** <sup>(4)</sup>. The once daily dose usually given in the morning **before meals** <sup>(2)</sup>. While twice daily dose given morning and night before meals.

5-Various PPI dosage forms and formulations exist and include the **enteric-coated granules contained in gelatin capsules** (omeprazole, esomeprazole, and lansoprazole), and delayed release **enteric-coated tablets** (rabeprazole, pantoprazole) . The enteric coating **prevents degradation of the drug in stomach acid** <sup>(4)</sup>.

PPIs		
Scientific names	Trade name	Dosage form
<b>Omeprazole</b>	Prilosec , <b>Gasec</b> <b>Losec</b> (AstraZeneca)	Cap. 10 , 20 , 40 .
<b>Lansoprazole</b>	Lancid , <b>Holicol</b> <b>Zolon</b> (Pfizer)	Cap. 15 , 30 .
<b>Rabeprazole</b>	Aciphex <b>Pariet</b> (Janssen , Eisal )	Tab. 10 , 20 .
<b>Pantoprazole</b>	<b>Protonix</b> Protium (Takeda)	Tab . 20 , 40 . Vial 40mg
<b>Esomeprazole</b>	<b>Nexium</b> (AstraZeneca)	Tab. 20 , 40 .

Any extra notes:

### 1.3-Histamine-2 Receptor Antagonists (H2RAs)

1-H2RAs include **cimetidine, ranitidine, famotidine, and nizatidine** <sup>(3)</sup>.

2- H2RAs are used for the treatments of **gastric and duodenal ulcers**. They can be used for the treatment of **dyspepsia** and **gastro-oesophageal reflux disease** <sup>(2)</sup>.

3-Cimetidine **inhibits several CYP450 isoenzymes**, resulting in **numerous drug interactions** (e.g., theophylline, warfarin, and clopidogrel) <sup>(4)</sup>. Avoidance of the combination, or a reduction in the dosage of these drugs may be required <sup>(1)</sup>.

4-**Ranitidine has less potential for hepatic CYP450 drug interactions**, while famotidine and nizatidine do not interact with drugs metabolized by the hepatic CYP450 pathway <sup>(4)</sup>.

5-Cimetidine has a weak anti-androgenic effect and **gynaecomastia** and **impotence** have also occasionally occurred in men; these are usually **reversible** <sup>(1)</sup>.

<b>H2RAs</b>		
<b>Scientific names</b>	<b>Trade name</b>	<b>Dosage form</b>
<b>Cimetidine</b>	<b>Tagamet</b> <sup>(chemidex)</sup>	Tab. 200 , 400 , 800 . Amp. 20mg/1 mL
<b>Ranitidine</b>	<b>Zantac</b> <sup>(GSK)</sup>	Tab. 150 , 300 . Amp.50 mg/2mL
<b>Famotidine</b>	Pepcid , <b>Famadar</b> , Famosam	Tab. 20 , 40 .

**Any extra notes:**

## 1.4-Laxatives

1-Laxatives promote defecation and are used in the treatment of **constipation** and for bowel **evacuation before investigational procedures such as endoscopy** <sup>(1)</sup>.

### 2- Type of laxative

<b>Type of laxative</b>	<b>Example(s)</b>	<b>Approximate onset of action</b>
<b>1-Stimulant laxative</b>	Senna, Bisacodyl, Sodium picosulfate, and Glycerin (supp.)	Oral:6-12hours Rectal: within 1 hour
<b>2-Bulk-forming laxative</b>	Methylcellulose, Bran , Sterculia and Ispaghula (Metamucil®)	1-3 days
<b>3-Lubricant(faecal softeners)</b>	Liquid paraffin	6-8 hours
<b>4-Osmotic laxative</b>	Lactulose	1-2 days

### 3- Product selection guidelines

<b>Patient</b>	<b>Preferred laxative</b>
<b>Pregnant women</b>	Bulk-forming laxative, or Lactulose may be used.
<b>Breast-feeding mother</b>	Bulk-forming laxative
<b>Children</b>	Glycerin(supp.) , Lactulose
<b>Advanced age(elderly)</b>	Bulk-forming laxative , Also Lactulose and Glycerin (supp.) are safe.

#### A-Stimulant laxatives:

1- Prolonged use may result in loss of colonic smooth muscle tone . Stimulant laxatives **should therefore be used for only short periods of a few days** .

2-Bisacodyl tablet is **enteric-coated**; therefore, it should be **swallowed whole** and should **not be taken within one hour of antacid or milk** as this will lead to dissolution of the coating and release of the drug into the stomach and cause gastric irritation.

3-Usual Doses :**Senna tab., Bisacodyl 5 mg tab. Adult dose:** usually 2 tablets (usually take at night to produce the effect next morning). While the dose of supp. Is one supp. (**usually in the morning**).

**Glycerin suppositories:**The patient should expect to have bowel movement quickly (within one hour).

4-Senna may **colour the urine** yellowish-brown at acid pH, and red at alkaline pH <sup>(1)</sup>.

### B-Lactulose (Osmotic laxative):

1-It can be taken by all age group , and can be **safely used in pregnancy** .

2-It is intensely **sweet in taste** (but it is safe for diabetic patients).

3-Adult laxative dose : 15 ml **twice daily**.

4- It discourages the proliferation of ammonia-producing organisms. It is therefore useful in the treatment of **hepatic encephalopathy** (in patients with liver cirrhosis) <sup>(2)</sup>.

### C- Bulk-forming laxative

1-The laxative effect can *take several days to develop* .

2- *Bulk-forming laxative preparations should be taken immediately before going to bed*, because there may be a risk of oesophageal blockage if the patient lies down directly after taking them.

3-When recommending the use of a bulk laxative, the pharmacist should advise that *an increase in fluid intake would be necessary*.

**D- Liquid paraffin:** its use decline nowadays due to many disadvantages.

<b>Laxatives (try to include the different types of laxatives )</b>				
	<b>Scientific name</b>	<b>Trade names</b>	<b>Type</b>	<b>Dosage form(s)</b>
1	Streculia Frangula	<b>Normacol Plus</b> (Norgine )	Bulk forming	Granules
2	streculia	<b>Normacol</b> (Norgine )	Bulk forming	Granules
3	Bicodyl	<b>Dulcolax</b> Laxidyl	Stimulant laxative	Tab. 5 Supp. 5 , 10 .
4	Glycerine	<b>Glycerine</b>	Stimulant laxative	Supp. 2 , 4

5	Sennoside	Senade Senokot <sup>(Reckitt)</sup> Benckiser)	Stimulant laxative	Tab.7.5 , 13.5 Syrup7.5mg/5mL
6	Castor oil	<b>Castor oil</b>	Stimulant laxative	Castor oil liquid
7	Lactulose	<b>Laxolac</b> Lactolac	Osmotic	Syrup.65g/100mL

**Any extra notes:**

## 1.5-Antidiarrhoeals

**Note :**the main aim in the management of *acute* diarrhoea is the correction of fluid and electrolyte depletion with rehydration therapy; this is especially important in infants and young children **and antidiarrhoeals are not generally recommended for this age group.**

### 1.5.1-Antimotility drugs (*Loperamide* , (Diphenoxylate+Atropine))

1-Antimotility drugs are not recommended for acute diarrhoea in young children <sup>(2)</sup>. In the UK, diphenoxylate hydrochloride is not licensed for **children under 4 years of age** <sup>(1)</sup>. In the UK, loperamide is not licensed for **children under 4 years of age**. In the USA, loperamide is not recommended for children under the age of 2 years <sup>(1)</sup>.

#### 2- Adult doses :

**Loperamide:** Initially 2 tablets followed by 1 tablet after each loose stool .

**Diphenoxylate+Atropine:** 4 tablets initially followed by 2 tablets every 6 hours.

### 1.5.2- Adsorbents (pectin +kaolin)

1- Adsorbents such as kaolin **are not recommended for acute diarrhoeas** <sup>(2)</sup>.

2-Kaolin can form insoluble complexes with some drugs in the gastrointestinal tract and reduce their absorption; **oral doses should not be taken at the same time** <sup>(1)</sup>.

### 1.5.3- Oral rehydration solution (ORS)

1- Only water should be used to make the solution and that boiled and cooled water should be used for children < 1 year.

**2-Stability of ORS after reconstitution:** After reconstitution, any unused solution should be discarded after 1 hour of preparation unless it stored in refrigerator where it may kept for up to 24 hours.

**3-Dose of ORS :** See table

Table 6 Amount of rehydration solution to be offered to patients.

Age	Quantity of solution (per watery stool)
Under 1 year	50 mL (quarter of a glass)
1–5 years	100 mL (half a glass)
6–12 years	200 mL (one glass)
Adult	400 mL (two glasses)

Antidiarrhoeals			
	Scientific name	Trade names	Dosage form
1	Diphenoxylate 4mg Atropine 0.25 mg	<b>Lomotil</b> , <b>Entero-stop</b>	Tab.
2	Loperamide	Imodium , diarr-stop <b>Vancotil</b> .	Tab.2mg Drop 2mg/mL
3	Loperamide 2mg Simeticone 125mg	Imodium Plus <sup>(McNeil)</sup>	Cap.

**Any extra notes:**

## 1.6-Antispasmodics

### 1.6.1-Antimuscarinics (e.g Hyoscine butylbromide)

1- Used for symptomatic relief of **gastro-intestinal disorders characterized by smooth muscle spasm** <sup>(1)</sup>.

2-Antimuscarinics are **contra-indicated in patients with prostatic enlargement** <sup>(2)</sup>.

1.6.2-Other antispasmodics ( **mebeverine**) are used to relieve pain in **irritable bowel Syndrome** <sup>(2)</sup>.

Antispasmodics			
	Scientific name	Trade names	Dosage form
1	Hyoscine N-butyl bromide	Antispasmine Buscopan <sup>(Boeching ingelheim)</sup>	Tab. 10 , amp.20mg/2mL Drop .10mg/mL , syrup 5/5mL
2	Mebeverine	<b>Dusptalin</b> Colofac <sup>(Abbott healthcare)</sup>	M.R cap.200mg , tab.100 , 135 .
3	Alverine citrate	<b>Spasmanol</b> <sup>(Meda)</sup>	Cap.60mg

Note: anticholinergics may be combined with benzodiazepine (librax®) or phenothiazine (stelabid®) *and they are used for gastrointestinal disorders associated with anxiety; and for irritable bowel syndrome. Also* they may be combined with an analgesics.

Compound anticholinergics		
Trade names	Scientific name	Dosage form
<b>Librax®</b>	Chlordiazepoxide 5mg Clidinium bromide 2.5mg	Tab.
<b>Stelabid®</b>	Isopropamide 5mg Trifluoperazine 1mg	Tab.
<b>Antispasmine-co®</b>	Homotropine methyl bromide Paracetamol Papverine	Tab. 4+350+60 Drop 2+120+30
<b>Riabal-co®</b>	Prifinium bromide 30 mg Paracetamol 325mg	Tab.

**Any extra notes:**

## 1.7-Antiemetics

1-(**Prochlorperazine, Metoclopramide and domperidone**) are used to treat or prevent nausea and vomiting.

2-**Cinnarizine** is used to prevent **motion sickness** where the dose is taken **2 hours before travel** <sup>(2)</sup>.

3- **Domperidone** has the advantage over metoclopramide and the **Prochlorperazine** of being less likely to cause central effects such as **dystonic reactions** (a **tetanus-like reaction**) because it does not readily cross the blood-brain barrier <sup>(2)</sup>.

**Important note** : in patients under 20 years: the dose of **Metoclopramide** should be determined on the **basis of body-weight (0.1 mg/kg/dose)** to avoid **dystonic reaction** <sup>(1, 2)</sup>.



<b>Antiemetics</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form(s)</b>
1	<b>Metoclopramide</b>	<b><u>Plasil</u></b>	Tab. 10mg Amp.10mg/2mL
2	<b>domperidone</b>	<b><u>Motillium</u></b> <sup>(Janssen)</sup>	Tab.10, supp. 30 , 60 , susp.1mg/mL
3	<b>Prochlorperazine</b>	<b><u>Stemetil</u></b>	Tab. 5 mg . Amp. 1.25%
4	<b>Cinnarizine</b>	<b><u>Stugeron</u></b> <sup>(Janssen)</sup>	Tab.25 , cap. 75 ,

**Any extra notes:**

## **1.8-Drugs for Inflammatory bowel disease ( ulcerative colitis and Crohn's disease).**

**Note:** Ulcerative colitis (UC) is confined to the rectum and colon, while Crohn's disease (CD) can involve any part of the gastrointestinal (GI) tract <sup>(4)</sup>.

### **A-Aminosaliclates (like Mesalamine, and Sulfasalazine)**

1-Sulfasalazine is given orally and it contain mesalamine combined with sulfapyridine which **is believed to be responsible for many of the adverse reactions to sulfasalazine**, mesalamine alone can be used <sup>(4)</sup>.

2-Mesalamine can be used topically as an **enema or suppository** for the treatment of proctitis or given orally in **slow-release formulations** that deliver mesalamine to the small intestine and colon <sup>(4)</sup>.

3-Because the oral mesalamine formulations are **coated tablets or granules**, they should not be crushed or chewed. Unlike sulfasalazine, it safe to use **for patients with sulfonamide allergies** <sup>(4)</sup>.

4-**Enemas or suppositories should be administered in the evening** <sup>(3)</sup>. They are given rectally, particularly when **disease affects the sigmoid colon and rectum** <sup>(1)</sup>.

**B-Other drugs may be used for Inflammatory bowel disease include corticosteroids, immunosuppressants ,....**

<b>Aminosalicylates</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form(s)</b>
1	<b>Sulfasalazine</b>	<b>Salazopyrin</b> (Pharmacia)	Tab. 500 .
2	<b>Mesalamine</b>	<b>Ipxol</b> <sup>(Sandoz)</sup> <b>Mezovante</b> <sup>(Shire)</sup>	M.R tab. 1.2g , tab. 400mg

**Any extra notes:**

### **1.9-Local preparations for anal and rectal disorders**

1-These products are used mainly for **haemorrhoids** and **anal fissure**.

2-They are usually formulated as **ointments and creams or suppositories**.

3-Ointments and creams can be used for **internal and external hemorrhoids** while **suppositories are used for internal hemorrhoids**.

However both are **usually given twice daily** (morning and evening) and **after each bowel movement**.

3-When used intrarectally, the ointment may be inserted using an applicator or finger but the **applicator is preferred** because it can reach an area where the finger cannot reach. The applicator should be **lubricated** by the ointment before insertion.

<b>Local preparations for anal and rectal disorders</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	Cinchocaine , Hydrocortisone	<b>Proctosedyle</b>	Ointment Supp.
2	Flucinolone acetone , lidocaine , mentol, bismuth subgallate	<b>Proctocinolone , Proctohate</b>	Ointment
3	Aluminium acetate , Hydrocortisone , lidocaine , Zinc oxide	<b>Xyloproct</b> (AstraZeneca)	Ointment

**Any extra notes:**

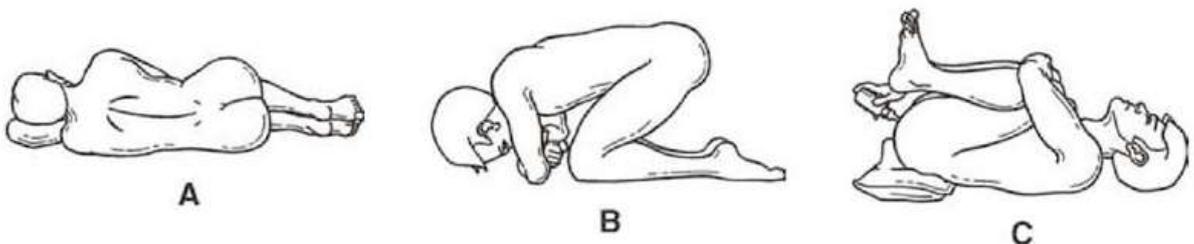
## 1.10- Administration of Rectal Suppositories and enemas <sup>(5)</sup> :

### Suppositories

- 1-Gently squeeze the suppository to determine if it is firm enough to insert. Chill a soft suppository by placing it in the refrigerator for a few minutes or by running it under cool running water.
- 2-Remove the suppository from its wrapping.
- 3-Dip the suppository for a few seconds in lukewarm water to soften the exterior.
- 4-Lie on your left side with knees bent or in the knee-to-chest position (see drawings A and B). Position A is best for self-administration of a suppository. Small children can be held in a crawling position.
- 5-Relax the buttock just before inserting the suppository to ease insertion. Gently insert the tapered end of the suppository high into the rectum. If the suppository slips out, it was not inserted past the anal sphincter (the muscle that keeps the rectum closed).
- 6-Continue to lie down for a few minutes, and hold the buttocks together to allow the suppository to dissolve in the rectum. The parent/caregiver may have to gently hold a child's buttocks closed.
- 7-Remember that the medication is most effective when the bowel is empty. Try to avoid a bowel movement after insertion of the suppository for up to 1 hour so that the intended action can occur.

### Enemas

- 1-If someone else is administering the enema, lie on your left side with knees bent or in the knee-to-chest position (see drawings A and B). Position A is preferred for children older than 2 years. If self-administering the enema, lie on your back with your knees bent and buttocks raised (see drawing C). A pillow may be placed under the buttocks.
- 2-If using a concentrated enema solution, dilute solution according to the product instructions. Prepare 1 pint (500 mL) for adults and 1/2 pint (250 mL) for children.
- 3-Lubricate the enema tip with petroleum jelly or other non-medicated ointment/cream. Apply the lubricant to the anal area as well.
- 4-Gently insert the enema tip 2 (recommended depth for children) to 3 inches into the rectum.
- 5-Allow the solution to flow into the rectum slowly. If you experience discomfort, the flow is probably too fast.
- 6-Retain the enema solution until definite lower abdominal cramping is felt. The parent/caregiver may have to gently hold a child's buttocks closed to prevent the solution from being expelled too soon.



## References

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## Chapter Two : Cardiovascular System

### 2.1-Angiotensin-converting enzyme inhibitors (ACE inhibitors)

1-Examples include ( captopril, enalapril, lisinopril and ramipril).

2- They act as vasodilators. The main uses of ACE inhibitors are in the management of **heart failure, hypertension, and myocardial infarction** <sup>(1)</sup>.

3- Pronounced **hypotension** may occur at the start of therapy with ACE inhibitors (first dose hypotension) <sup>(1)</sup>. Therefore:

- A- The **first dose** should preferably be given at **bedtime** <sup>(2)</sup>.
- B- **Starting dose should be low then increased gradually.**

4-Other adverse effects include **persistent dry cough** <sup>(1)</sup>(see angiotensin II receptor antagonists below).

<b>ACE inhibitors</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Captopril</b>	<b>Capoten</b> <sup>(Squibb)</sup>	Tab. 25 , 50 , 100 .
2	<b>Enalapril</b>	<b>Vasotec</b> Innovace <sup>(MSD)</sup>	Tab. 10 , 20 .
3	<b>Lisinopril</b>	<b>Zestril</b> <sup>(AstraZeneca )</sup>	Tab. 5 , 10 ,20 .

<b>Any extra notes:</b>			
4	<b>Ramipril</b>	Altace Tritace <sup>(Sanofi Aventis)</sup>	Tab. 1.25 , 2.5 , 5 ,10

### 2.2-Angiotensin II receptor antagonists(A2RAs) (angiotensin II receptor blockers).

1- Examples include (Candesartan, telmisartan, losartan and valsartan)(**sartans**).

2- They act as vasodilators. The main uses of **A2RAs** inhibitors are in the management of **heart failure, hypertension, and myocardial infarction** <sup>(1)</sup>

3-**Important: unlike ACE inhibitors, they are less likely to cause the persistent dry cough** which can complicate ACE inhibitor therapy. They are therefore a

useful **alternative for patients who have to discontinue an ACE inhibitor because of persistent cough** <sup>(2)</sup>.

**Note 2:** There are many combination products in the market that contain a combination of an **A2RA and diuretic** (mostly **hydrochlorothiazide**) used for **hypertension not adequately controlled with A2RA alone** <sup>(2)</sup>.

<b>Angiotensin II receptor antagonists (including at least one combination product with diuretic)</b>			
	<b>scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Candesartan cilexetil</b>	<b>Atacand</b> Amias <sup>(Takeda)</sup>	Tab. 8 , 16 . Tab. 2, 4,8,16,32 .
2	<b>losartan</b>	<b>Cozaar</b> <sup>(MSD)</sup>	Tab. 50 ,100 .
3	<b>Valsartan</b>	<b>Diovan</b> <sup>(Novartis)</sup>	Tab. 80 , 160 .
4	<b>Irbesartan</b>	Sabervel or Aprovel	Tab. 75, 150 , 300.
5	<b>Telmisortan</b>	<b>Micordis</b> <sup>(Boehringer)</sup> MicordisPlus <sup>(Boehringer)</sup>	Tab. 20, 40 ,80 . Tab.40/12.5, 80/12.5, 80/25

**Any extra notes:**

<b>Valsartan +Hydrochlorothiazide</b>	<b>Diovan Plus</b> <sup>(Novartis)</sup>	<b>tab.80/12.5 ,160/12.5, 160/25</b>
<b>Losartan+ hydrochlorothiazide</b>	<b>Angezaar – H</b>	<b>Tab. 50/12.5, 100/12.5</b>

### **2.3-Beta-adrenoceptor blocking drugs (beta-blockers)**

1-Examples include (Atenolol, bisoprolol, carvedilol, metoprolol, and propranolol).

2-Beta blockers are used in the management of:

A-**Cardiovascular disorders** such as **hypertension, angina pectoris, cardiac arrhythmias, myocardial infarction**, and some of them are used for **heart failure** <sup>(1)</sup>.

B-They are also given to control symptoms of sympathetic overactivity, **anxiety states, hyperthyroidism**, and in the **prophylaxis of migraine** <sup>(1)</sup>.

C-Some Beta blockers used as **eye drops** (e.g. timolol) to reduce raised intra-ocular pressure in **glaucoma** <sup>(1)</sup>.

### **3-Important:**

A- **Bisoprolol , carvedilol , metoprolol** and nebivolol are the beta-blockers that are **used to treat heart failure** (other beta- blockers are contraindicated).

B-When used for heart failure,  $\beta$ -blockers should be started in very low doses with slow upward dose titration (**start low, go slow**) e.g :

Carvedilol start with 3.125 mg  $\longrightarrow$  6.25 mg  $\longrightarrow$  12.5 mg  $\longrightarrow$  25 mg)

4-Beta-blockers can **precipitate bronchospasm** and should therefore usually be **avoided in patients with a history of asthma** <sup>(2)</sup>.

5-**Abrupt cessation of  $\beta$ -blocker therapy should be avoided** (abrupt discontinuation of  $\beta$ -blockers may be associated with tachycardia, in addition to increased BP). For these reasons, it is always prudent to **taper the dose gradually** over 1 to 2 weeks before discontinuation <sup>(2)</sup>.

<b>Beta-blockers (try to select different scientific names)</b>			
	<b>scientific name</b>	<b>Trade name</b>	<b>Dosage form</b>
1	Atenolol	<b>Tenormin</b>	Tab. 25, 50 ,100 .
2	Metoprolol	Topral <b>Betaloc</b> <sup>(AstraZeneca)</sup>	Tab. 50, 100 .
3	Carvedilol	<b>Coreg</b>	Tab. 3.125, 6.25, 12.5 ,25 .
4	Propranolol	<b>Inderal</b> Inderal LA <sup>(AstraZeneca)</sup>	Tab. 10, 40 . Tab. 80 ,160 .
5	Bisoprolol	<b>Cardicor</b> <sup>(Merck Serona )</sup>	Tab. 1.25, 2.5 , 3.75, 5 ,7.5 , 10 .
6	labetalol	<b>Trandate</b> <sup>(phor Safer)</sup>	Tab. 50 , 100 , 200

<b>Any extra notes:</b>		
<b>Nadolol</b>	<b>Corgard</b> <sup>(Sanofi Aventis)</sup>	tab.80 .

## **2.4- Calcium-channel blockers (CCBs)**

**1-CCBs include :**

**A-Dihydropyridine CCBs (examples amlodipine, nifedipine):** They have a greater **selectivity for vascular smooth muscle** than for heart and therefore their main effect is vasodilatation <sup>(1)</sup>.

**B- Non-Dihydropyridine CCBs (examples diltiazem and verapamil):** They have a greater selectivity for heart than for vascular smooth muscle.

2-The main use of CCBs is in the management of **angina pectoris and hypertension (both types of CCBs)** ; some are also used in cardiac **arrhythmias (non-dihydropyridine CCBs)** <sup>(1)</sup>.

**3-CCBs (especially dihydropyridine CCBs) can cause ankle edema as a side effect<sup>(2)</sup>.**

**4-Nifedipine is a short acting , therefore it is commonly formulated as sustained release formulation (long acting dosage form).**

<b>CCBs</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Amlodipine</b>	Amlostin or Norvasc Istin <sup>(Pfizer)</sup>	Tab. 5 , 10 .
2	<b>Diltiazem</b>	Cardizem Tildiem <sup>(Sanofi Aventis )</sup>	Tab. 60 , 90 , 120 .
3	<b>Nifedipine</b>	Procardia Adalat <sup>(Bayer)</sup>	S.R Tab. 5 , 10 .
4	<b>Verapamil</b>	Isoptin or zolvera Cardilax <sup>(Dexcel)</sup>	Tab. 40 ,80 ,120, 160 . Amp. 2.5mg/mL
5	<b>Nimodipine</b>	Nimotop <sup>(Bayer)</sup>	Tab. 30 . Amp. 0.2mg /mL
6			

**Any extra notes:**

**Note : Fixed-dose combination products**

Several fixed-dose combination products are available , **their use can reduce the number of tablets or capsules taken by patients.** This has been demonstrated to **improve adherence compared with using two separate single-drug products.** Improved adherence may increase the likelihood of achieving goal BP values <sup>(3)</sup>.

<b>Fixed-dose combination products</b>			
	<b>Scientific name</b>	<b>Trade name</b>	<b>Dosage form</b>
1	<b>Lisinopril 5mg Amlodipine 5mg</b>	<b>Hipril-A®</b>	Tab.
2	<b>Candesartan 8 , 16 Hydrochlorthiazide 12.5 , 25</b>	<b>Atacand Plus</b>	Tab .
3	<b>Lisinopril 10 or 20 mg Hydrochlorthiazide 12.5 , 25</b>	<b>Zestoetic</b> <sup>(AstraZeneca )</sup>	Tab.

## 2.5-Diuretics

1-Diuretics promote the excretion of water and electrolytes by the kidneys. They are used in the treatment of **heart failure, hypertension** and other diseases when salt **and water retention has resulted in oedema** <sup>(1)</sup>.

2-The principal groups of diuretics are as follows.

Diuretic type	examples
<b>Thiazide and related diuretics</b>	Hydrochlorothiazide, Chlortalidone
<b>Loop Diuretics</b>	Furosemide, Bumetanide
<b>Potassium (K<sup>+</sup>)-sparing diuretics</b>	Amiloride
<b>Aldosterone antagonist</b>	Spironolactone
<b>Carbonic anhydrase inhibitors</b>	Acetazolamide (mainly for <b>glaucoma</b> )

3- Diuretics ideally should be dosed in the **morning** if given once daily and in the **morning and afternoon** if dosed twice daily to minimize the risk of nighttime diuresis <sup>(4)</sup>.

4- Thiazide and loop diuretics can cause **hypokalemia** while K-sparing diuretics can cause **retention of potassium** and therefore, they are given with thiazide or loop diuretics to minimize hypokalemia <sup>(2)</sup>.

5- Spironolactone has an **anti-androgenic properties**, therefore:

A-It may cause side effects like **Gynecomastia (breast enlargement)** , and **impotence** in men.

B- It has been used for its anti-androgenic properties in some cases of **acne** and for women with **Hirsutism (hair on the face)** <sup>(1)</sup>.

Diuretics			
	Scientific name	Trade names	Dosage form
1	<b>Chlortalidone</b>	<b>Hygroton</b> <sup>(Alliance)</sup>	Tab. 50
2	<b>Furosemide</b>	<b>Lasix</b> <sup>(Sanofi Aventis)</sup>	Amp. 10mg/mL Tab.20, 40
3	<b>Spironolactone</b>	<b>Aldactone</b> <sup>(pharmacia)</sup>	Tab. 25 , 50 ,100 .
4	<b>Acetazolamide</b>	<b>Cidamax</b>	Tab.250 .
5	<b>Hydrochlorothiazide – Amiloride</b>	<b>Moduretic</b>	Tab .
6	<b>Bumetanide</b>	<b>Burinx</b>	Tab.1 , 5 .amp.0.5mg/mL Syrup 1mg /5mL

**Any extra notes:**

## 2.6-Lipid-regulating drugs

1- Lipid regulating drugs are used to modify blood lipid concentrations in the management of **hyperlipidaemias and for the reduction of cardiovascular risk** <sup>(1)</sup>.

2-The principal groups of lipid regulating drugs are the

A- **Statins** like (atorvastatin, rosuvastatin, and simvastatin)

B- **Fibrates** like gemfibrozil.

3-**Important** : The **main effect of statins is to reduce cholesterol** while the **main effect of fibrates is to reduce triglycerides** <sup>(1)</sup>.

4- **Important** : Cholesterol synthesis in the liver peaks during the early morning (midnight to 3 a.m.) and therefore **most of statins such as simvastatin should be taken in at night** <sup>(1)</sup>.

5- **Important** : patients taking **simvastatin or atorvastatin** should be advised to **avoid Grapefruit juice** (because it inhibit their metabolism → increase their conc. → increase their side effects) <sup>(1)</sup>.

Lipid-regulating drugs			
	Scientific name	Trade names	Dosage form
1	<b>Atorvastatin</b>	<b>Lipitor</b> <sup>(Pfizer)</sup>	Tab. 10 ,20 ,40 .
2	<b>Gemfibrozil</b>	<b>Lopid</b> <sup>(Pfizer)</sup>	Cap. 300 ,600 .
3	<b>Simvastatin</b>	<b>Zocor</b> <sup>(MSD)</sup>	Tab. 10 , 20 ,40 , 80 .
4	<b>Rosuvastatin</b>	<b>Crestor</b> <sup>(AstraZeneca)</sup>	Tab. 5, 10 , 20 , 40 .
5	<b>Omega-3 fatty acid</b> (may be used to reduce triglycerides)	<b>Omacor</b> <sup>(Abbott healthcare )</sup>	Cap. 380 .

<b>Any extra notes:</b>		
<b>Fluvastatin</b>	<b>Lescol</b> <sup>(Novartis)</sup>	<b>cap. 20 ,40 .</b>

## 2.7-Nitrates

1-Nitrates are peripheral and coronary vasodilators used in the management of **angina pectoris, heart failure, and myocardial infarction** <sup>(1)</sup>.

2- **Sublingual** (or aerosol spray) of **glyceryl trinitrate** are used to provide **rapid symptomatic relief of acute anginal attack** while and **transdermal patches** of **glyceryl trinitrate** are used the **long-term prophylaxis** of angina.

3-Other nitrate available in Iraq are **Isosorbide Dinitrate (ISDN)** and **Isosorbide Mononitrate (ISMN)** which are commonly given by **oral route**.

4-ISMN has longer duration than ISDN : The advantage of ISMN is **twice** daily dosing (or **once daily with sustained release** products) which mean better compliance<sup>(3)</sup>.

5- Nitrate can cause **headache** that is usually **transient**, typically lasting several days to few weeks . Patients can use simple analgesics (**Paracetamol**) when required to control any headaches<sup>(3)</sup>.

### (طريقة استعمال حبوب الانجسيد تحت اللسان)

- 1- عند حدوث الألم في الصدر---يجب الجلوس فوراً مع وضع الحبة تحت اللسان.
- 2- إذا لم يختف الألم بعد 5 دقائق فتوضع حبة ثانية تحت اللسان .و إذا لم يختف الألم بعد 5 دقائق أخرى فتوضع حبة ثالثة تحت اللسان وإذا لم يختف الألم بعد 5 دقائق أخرى فيجب الذهاب فوراً إلى المستشفى.
- 3- وإن كانت المصادر الحديثة توصي بالاتصال بالإسعاف عند عدم زهاب الألم بعد تناول الحبة الأولى .
- 3- قد تشعر عند استخدامك للحبوب بشئ من الصداع أو الدوار أو الخفقان أو الطعم الحاد للحبة في الفم وهذا شئ طبيعي نتيجة عمل الدواء الموسع للشرايين.
- 4- من الممكن أن يستخدم الانجسيد كوقاية وذلك بأخذ حبة تحت اللسان ( 5- 10 دقائق ) قبل القيام بأي عمل مجهود يتوقع له أن يسبب ألماً في الصدر.
- 5- يجب أن يحفظ الدواء في علبته الأصلية وليس خارجها. ويحفظ في مكان بارد وجاف (ولكن ليس في الثلاجة) بعيداً عن الضوء والحرارة والرطوبة. كما يجب أن تغلق العلبة بإحكام بعد كل عملية استخدام.
- 6- ترمى الحبوب ولا تستعمل أبداً بعد مضي فترة شهرين من تاريخ فتح العلبة.

حيث تقل فعالية الدواء عند الاستعمال المتواصل ولتفادي في النايترت هناك مشكلة مهمة تسمى

### tolerance

هذه المشكلة نعمل فترة استراحة يومية تسمى **nitrate-free interval (NFI)** بالطريقة الآتية :

- 1- إذا كان المريض يتناول ثلاث حبات في اليوم فان الجرعة الأولى يتناولها عند استيقاظه صباحاً والجرعة الثانية يتناولها بعد 5-6 ساعات (وليس بعد 8 ساعات كما هو الحال مع المضادات الحيوية مثلاً) ويتناول الجرعة الثالثة أيضاً بعد 5-6 ساعات من الجرعة الثانية وهكذا فستحصر فترة الاستخدام بين الصباح والمغرب وتبقى فترة الليل بدون دواء (استراحة) .
- 2- أما إذا كان المريض يتناول حبتين في اليوم فان الجرعة الأولى يتناولها عند استيقاظه صباحاً والجرعة الثانية يتناولها بعد 8 ساعات تقريباً (وليس بعد 12 ساعات) ولنفس السبب أعلاه.

6- Nitrates should not be used within **24 hours of taking sildenafil or vardenafil** or within **48 hours of taking tadalafil** because of the potential for life-threatening **hypotension** <sup>(3)</sup>.

<b>Nitrates</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Glyceryl trinitrate</b>	<b>Angised</b> <sup>(GSK)</sup>	<b>Sublingual tablet 100mg</b>
2	<b>Glyceryl trinitrate</b>	Transiderm –Nitro <sup>(Novartis)</sup>	<b>Patch</b>
3	<b>ISDN</b>	<b>Isordil</b> Isoket retard <sup>(UCB pharma)</sup>	S.R TAB. 20. Tab. 10 ,20 .
4	<b>ISMN</b>	Ismo <sup>(duritin)</sup>	Tab. 10 , 20 .

**Any extra notes:**

## **2.8-Antiplatelet drugs**

1- Antiplatelet drugs **reduce platelet aggregation** and are used to **prevent further thromboembolic events** in patients at risk (e.g. patients who have suffered myocardial infarction) <sup>(3)</sup>.

2-The most commonly used Antiplatelet drugs in Iraq are **aspirin** (at low dose) and **clopidogrel**. Less commonly is **dipyridamole**.

3- A-**Clopidogril** may be given **as an alternative to aspirin** (in patients who cannot take aspirin) <sup>(2)</sup>.

B- Clopidogril may be given **in combination with aspirin** in some conditions like **myocardial infarction** <sup>(2)</sup>.

4-Aspirin tablet commonly formulated as **enteric coated tablet** to decrease GIT irritation.

<b>Antiplatelet drugs</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Aspirin (low dose)</b>	Nu-seal <b>Aspirin</b> <sup>(Alliance)</sup>	Tab. 75 , 300 , 81 .
2	<b>Clopidogril</b>	<b>Plavix</b> <sup>(Sanofi-Aventis)</sup>	Tab. 75 , 300 .
3	<b>Dipyridamole</b>	<b>Persantin</b> <sup>(Boehring ingelheim)</sup>	Tab. 100 , Amp. 5mg /mL

Any extra notes:

## 2.9- Anticoagulants

1-Anticoagulants are used in the **treatment and prophylaxis** of thromboembolic disorders <sup>(1)</sup>.

2- Anticoagulants available in Iraq now are :

A-**Oral** anticoagulants : **Warfarin** .

B- **Parenteral** anticoagulants (mostly given subcutaneously)which include:

1-Heparin (called unfractionated heparin).

2- **Low-molecular-weight heparins** (LMWHs) like **enoxaparin**: which have **many advantages over unfractionated heparin** like **lower risk of bleeding**.

3-Anticoagulants can cause **bleeding** , therefore their anticoagulant effects must be **monitored by laboratory test to avoid excessive bleeding** :

A-**Warfarin** is monitored by a test called **international normalized ratio (INR)**.

B- **Unfractionated heparin** is monitored by a test called **activated partial thromboplastin time (APTT)**.

Anticoagulants			
	Scientific name	Trade names	Dosage form
1	<b>Warfarin</b>	Coumadin or warfarin	<b>Tab. 1 ,3 , 5</b>
2	<b>Unfractionated heparin</b>		
3	<b>Enoxaparin</b>	<b>Celexane</b> <sup>(Sanofi-Aventis)</sup>	Amp. 1000 , 2000 , 3000, 4000, 5000, 6000
4	<b>Dalteparin sodium</b>	<b>Fragmin</b> <sup>(Pfizer)</sup>	<b>Amp. 12500 I.U ,25000 I.U</b>

Any extra notes:

## 2.10-Miscellaneous cardiovascular drugs

### 1-Digoxin

A- The most common use of digoxin is for **certain type of arrhythmia called atrial fibrillation (AF)**.

B- **Less commonly** it is used for **heart failure**.

## 2- Methyldopa:

Methyldopa used mostly for the treatment of **hypertension in pregnancy**.

## 3- Tranexamic acid and aminocaproic acid:

They are used to **prevent bleeding or to treat bleeding** e.g. bleeding associated with **menorrhagia ( excessive menstrual bleeding )**.

Miscellaneous cardiovascular drugs			
	Scientific name	Trade names	Dosage form
1	<b>Digoxin</b>	<b>Lanoxin</b> <sup>(Aspen)</sup>	<b>Tab. 0.125 , 0.25 .</b>
2	<b>Methyldopa</b>	<b>Aldmet</b> <sup>(Aspen)</sup>	<b>Tab. 250 , 500 .</b>
3	<b>Tranexamic acid</b>	<b>Cyklokapran</b> <sup>(Meda , Pfizer)</sup>	Tab. 500 Amp. 100mcg/mL
4	<b>Aminocaproic acid</b>	<b>Amicor</b>	Tab. 500 Amp. 250mg/mL

**Any extra notes:**

### References

- 1- Sean C. Sweetman. Martindale: The Complete Drug Reference, 36th Edition. Pharmaceutical Press 2009.
- 2-BNF 61.
- 3- Mary Anne koda-kimble (ed.), Applied Therapeutics: The clinical use of drugs, 10th ed.2013
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## Chapter Three: Respiratory System

### 3.1-Bronchodilators and Anti-asthma Drugs

#### Note:

1-Administration of drugs by the **inhaled route** delivers the drug directly to the Airways with **fewer systemic side effects** than either the parenteral or oral routes <sup>(1,2)</sup>.

2-Commonly inhalation dosage forms available in Iraq are **inhaler**, **nebulizer**, and **turbohaler** (the use of turbohaler is much easier than inhaler).

#### How to use a metered dose inhaler

1. Remove the cap covering the mouthpiece and check that there is no fluff or dirt in the mouthpiece.

2. Shake the inhaler.

3. If the inhaler is new or has not been used for some time it will need to be tested. To test: Hold the inhaler away from body. Press the top of the aerosol canister once.

A fine mist should be puffed into the air. The inhaler is now ready to use.

4. Tilt head back slightly.

5. Breathe out gently.

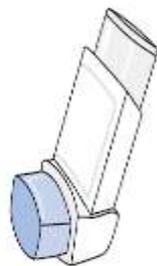
6. Place the mouthpiece in the mouth between the teeth (do not bite). Close lips around the mouthpiece.

7. Start to breathe in slowly through the mouth, at the same time press down on the inhaler to release the medicine in to the lungs.

8. Hold breath for between 5 and 10 seconds, then breathe out slowly.

9. If a second dose is required, wait approximately 30 seconds and repeat the process.

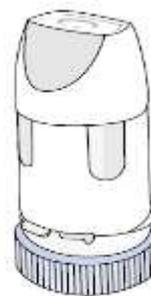
10. Replace the cap and if the inhaler is a corticosteroid inhaler, rinse the mouth out with water.



An example of a metered dose inhaler.

#### How to use a Turbohaler

A Turbohaler is a dry powder inhaler. To load it prior to use:



An example of a Turbohaler.

1. Unscrew the cover and remove it.

2. Hold the Turbohaler upright with one hand and with the other twist the grip in one direction as far as it will go.

3. Now twist back as far as it will go – a click should be heard, showing the inhaler is primed and ready for use.

4. Breathe out gently.

5. Place the mouthpiece between the lips and breathe in through the mouth as deeply and as hard as possible.

6. Remove the inhaler from the mouth and breathe out slowly.

7. Replace the cover.

8. Repeat the above steps if more than one puff is required.

### 3.1.1-Selective beta2 agonists

**1-Short-acting beta2 agonists (SABAs)** (such as **salbutamol** or **terbutaline**). Because of their **rapid onset of action**, they are considered the first choice for **the treatment of acute asthmatic attack** (and other conditions associated with airways obstruction)<sup>(1-3)</sup>.

2-Inhaled **SABAs** are given ‘**as required**’ and **NOT as Regular treatment**<sup>(2)</sup>.

**3- Long-acting beta2 agonists Formoterol and salmeterol** : they are taken **regularly as prophylaxis** for chronic asthma or chronic obstructive pulmonary disease (COPD).

4-Note: **Salbutamol** may be used by some gynecologist as a **uterine relaxant for pregnant women**.

### 3.1.2-Inhaled corticosteroid (e.g. Beclomethasone Dipropionate)

1-An inhaled corticosteroid is used **regularly for prophylaxis of asthma**.

2-They are **ineffective for acute asthmatic attack**.

3- Inhaled corticosteroid may cause **oral candidiasis (oral fungal infection)** and this side effect can be **reduced by rinsing the mouth with water** after inhalation of a dose.

#### Note :

1-Inhale to relieve **acute asthmatic attack** examples: salbutamol are generally **colored blue**. While inhaler for **prophylaxis of asthma** (like corticosteroid) are generally **colored brown or orange**).

2- Some products contain a combination of inhaled corticosteroid and long acting beta2 agonist e.g. **Symbicort ® turbobaler (budesonide with formoterol)**

### 3.1.3-Antimuscarinic bronchodilators (ipratropium, and Tiotropium)

1- They are used by inhalation as a bronchodilator in the treatment of asthma and chronic obstructive pulmonary disease (COPD).

2- **Tiotropium** has the advantage of having a longer duration of action than ipratropium.

### 3.1.4-Theophylline (and aminophylline )

1- Theophylline is a bronchodilator used in asthma and chronic obstructive pulmonary disease <sup>(2)</sup>.

2- Theophylline is given by **injection as aminophylline. Aminophylline injection must be given by very slow intravenous injection** (over at least 20 minutes).

3-The use of **sustained release formulation of theophylline** (phyllocontine®) is **preferred** over ordinary tablet (immediate release tablet) and it is usually **given twice daily** and the **sustained release tablet should not be splinted or crushed.**

### 3.1.5-Leukotriene receptor antagonists (montelukast and zafirlukast)

1-They are given **orally** mainly for **prophylaxis of asthma.**

2-In addition to ordinary tablet , **montelukast** also formulated as **Chewable tablet** which contain a lower dose and intended mainly for **children.**

<b>Bronchodilators and Anti-asthma Drugs</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage forms</b>
<b>1</b>	<b>Salbutamol</b>	<b>Ventolin</b> <sup>(A&amp;H)</sup>	Tablet, syrup, <b>inhaler</b> , and <b>nebulizer</b>
<b>2</b>	<b>Beclomethasone Dipropionate</b>	<b>Pulvinal</b> , Becodisk <sup>(A&amp;H)</sup> Asmabec <sup>(USBpharma)</sup>	Dry powder for inhalation 100mcg .
<b>3</b>	<b>Theophylline</b>	<b>Nuelin SA</b> <sup>(Meda)</sup> <b>Slo-phyllin</b> <sup>(Merck serona )</sup>	S.R tab 175mg S.Rcap. 60mg
<b>4</b>	<b>Montelukast</b>	<b>Singulair</b> <sup>(MSD)</sup>	Chewable tab. 4 , 10
<b>5</b>	<b>Bambuterol</b>	<b>Bambec</b> <sup>(AstraZeneca)</sup>	Tab.10mg
<b>6</b>	<b>Salmeterol</b>	<b>Serevent</b> <sup>(A&amp;H)</sup>	Dry powder for inhalation
<b>7</b>	<b>Aminophylline</b>	<b>Phyllocontin</b> continuous <sup>(Napp)</sup>	Tab. 225
<b>8</b>	<b>Fluticasone</b>	<b>Flixotide</b> <sup>(A&amp;H)</sup>	Dry powder 50 mcg .

#### Any extra notes:

**Budesonide**                      **Easyhaler-Budesonide** <sup>(Meda , AstraZeneca)</sup>      Dry powder 100mcg  
**Budesonide +formeterol**      **Symbicort** <sup>(AstraZeneca)</sup>                      Dry powder for inhalation

### 3.2-Antihistamines

1-Antihistamines are used in the treatment of **nasal allergies** (they **reduce rhinorrhoea and sneezing**)( Antihistamines are frequently used in combination preparations for the treatment of **coughs and colds**). Antihistamines are also used to **treat urticarial rashes, pruritus, and insect bites and stings** <sup>(1)</sup>.

2-The antihistamines may be classified into :

**A- Sedating antihistamines:** older antihistamines that are associated with troublesome **sedative** and antimuscarinic effects. Example are (chlorphenamine(chlorpheniarminine) maleate, clemastine, cyproheptadine, ketotifen, diphenhydramine, and dimethindene maleate ) <sup>(1)</sup>. Drowsiness is a major problem with the *sedating antihistamines* and those affected should **not drive or operate machinery** <sup>(1)</sup>.

**B- Non-sedating antihistamines:** are newer antihistamines, **they generally cause little or no drowsiness** <sup>(1)</sup>. Example are (cetirizine, levocetirizine , loratadine , desloratadine, fexofenadine).

3- Because of their antimuscarinic actions (like urinary retention), **the sedating antihistamines should be used with caution in conditions such prostatic hyperplasia**. Antimuscarinic adverse effects are not a significant problem with the non-sedating antihistamines <sup>(1)</sup>.

4-**Important : Cyproheptadine** has been widely **used as an appetite stimulant**, but in the long-term appears to have little value in producing weight gain and **such use is no longer generally recommended** <sup>(1)</sup>.

5-Diphenhydramine has pronounced sedative properties and may be **used as a hypnotic in the short-term management of insomnia**(taken before bedtime) <sup>(1)</sup>.

Antihistamines			
	Scientific name	Trade names	Dosage forms
1	Chlorpheniarminine	<b>Histadin</b> <b>Piriten</b> <sup>(GSK)</sup> consumerhealthycar	Tab. 4 mg
2	Diphenhydramine	<b>Allermine</b>	Tab .25 , syrup. 25/5mL
3	Cyproheptadine	<b>Periactin</b> <sup>(Auden Mckenzte)</sup>	Tab .4mg . Syrup 2mg/mL
4	<b>Ketotifen</b>	<b>Zaditen</b> <sup>(Swedish orphan )</sup>	Tab. 1mg Elixir 1mg/mL
5	<b>Dimethindene</b>	<b>Fenistil</b> <sup>(Novertis)</sup>	Tab.4mg Oral drop 1mg/1mL
6	<b>Loratadine</b>	<b>Loratin</b>	Syrup 5mg/5mL Tab. 5, 10



7	<b>Desloratadine</b>	<b>Neoclarityn</b> <sup>(MSD)</sup>	Tab. 5 , syrup 2.5mg/5mL
8	<b>Fexofenadine</b>	<b>Telfast</b> <sup>(Sanofi-Aventis )</sup>	Tab. 120 ,180 .
9	<b>Hydroxyzine</b>	<b>Atarax</b> <sup>(Alliance )</sup>	Tab. 10 , 25 .

**Any extra notes:**

### 3.3-Cough preparations

1- **Cough suppressants (antitussive):** like Codeine, and dextromethorphan are used for dry cough.

2- **Expectorants** (e.g. Glyceryl guaiacolate (also called Guaifenesin)) and **Mucolytics** (e.g. Bromohexine ): which are used for wet cough.

3-**Commonly**, cough preparations contain a combination of antitussive or expectorants, antihistamine, and / or sympathomimetic (for congestion) .

4-**Lozenges** may also be used for cough especially for pregnant women.

<b>Cough preparations</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Bromoxine HCl</b>	<b><u>Solvodin®</u></b>	Tab. 8mg , syrup 4mg/5mL
2	<b>Dextromethorphan</b>	<b>Sedilar®</b>	Tab. 15 , syrup 15mg/5mL
3	<b>Chlorphenaramine , phenylephrine , Ephedrine , codeine</b>	<b>Tussiram®</b>	Syrup
4	<b>Chlorphenaramine , phenylephrine , vit. C , codeine , Glyceryl guaiacolate</b>	<b>Pulmocodin®</b>	Syrup
5	<b>Diphenhydramine , Al-Chloride, Na-citrate, menthol .</b>	<b>Samillin®</b>	Syrup
6	<b>Chlorphenaramine , Glyceryl guaiacolate , phenylephrine</b>	<b>Tussilet ®</b>	Syrup
7	<b>Diphenhydramine , NH<sub>4</sub> Cl, Tulo syrup , phenylephrine</b>	<b>Pectomex® Pectomed ®</b>	Syrup
8	<b>Dextromethorphan , oxomemazine , Na-benzoate</b>	<b>Toxil ®</b>	Syrup

**Any extra notes:**

### 3.4-Orally administered nasal decongestants

1-These are usually contain a combination of **sympathomimetics** like pseudoephedrine and phenylphrine (they reduce nasal congestion) and **antihistamine** (like triprolidine) (they reduce rhinorrhoea and sneezing).

2-Systemic decongestants (sympathomimetics ) should be used with caution in **hypertension, hyperthyroidism, and ischaemic heart diseases** <sup>(1)</sup>.

Orally administered nasal decongestants			
	Scientific name	Trade names	Dosage form
1	<b>Paracetamol 450mg , promethazine 5mg , phenylephrine 5mg</b>	<b>Coldin®</b>	Tablet
2	<b>Paracetamol , vit.C , chlorpheniramine</b>	<b>Flu-out®</b>	Tablet
3	<i>Tripolidine 2.5mg, Pseudoephedrine 60mg</i> <b>Tripolidine 1.25mg, Pseudoephedrine 30mg</b>	<b>Actifed® tablet and yellow colored syrup</b>	<b>Tablet and syrup</b>
4		<b>Actifed® green colored syrup</b>	<b>syrup</b>
5		<b>Actifed® red colored syrup</b>	<b>syrup</b>
6	<b>Paracetamol ,caffeine , phenylephrine</b>	<b>Panadol cold and flu® (yellow color)</b>	Tablet
7	<b>Paracetamol , Pseudoephedrine 30mg Chlorpheniramine maleate 2mg</b>	<b>Panadol cold and flu® (green color)</b>	Tablet
8	<b>Paracetamol , Pseudoephedrine 30mg</b>	<b>Panadol sinus®</b>	Tablet
9			
10			

#### References

- 1- Sean C. Sweetman. Martindale: The Complete Drug Reference, 36th Edition. Pharmaceutical Press 2009.
- 2- BNF 61.
- 3- Mary Anne koda-kimble (ed.), Applied Therapeutics: The clinical use of drugs, 10th ed.2013 .

## Chapter Four : Central nervous system

**Note:** most of the CNS drugs (like **antipsychotics, antidepressant, antiepileptics, anxiolytics, hypnotics, opioid analgesics** can cause **drowsiness**, thereby affecting the ability to drive and operate hazardous machinery and patients should be warned about this.

### 4.1-Hypnotics and anxiolytics

1- Hypnotics are used for patients with insomnia, while anxiolytics are used for patients with anxiety <sup>(2)</sup>.

2-Prescribing of these drugs is widespread but **dependence** and **tolerance** occur. This may lead to **difficulty in withdrawing the drug**.

3-Hypnotics and anxiolytics should be reserved for **short courses** to alleviate acute conditions after causal factors have been established <sup>(2)</sup>.

4-**Benzodiazepines** are the most commonly used anxiolytics and hypnotics. The most commonly Benzodiazepines available in Iraq now are :

(Alprazolam, Chlordiazepoxide, Diazepam, and Lorazepam)

Benzodiazepines			
	Scientific name	Trade names	Dosage form
1	Diazepam	Valium	Tab.2 , 5 ,10 . Amp.1mg/mL, syrup 2mg/5mL
2	Lorazepam	Ativan	Tab.1 ,2.5 , amp.4mg/mL
3	Chlordiazepoxide	Librium	Tab. 5 , 10 . Cap. 5, 10 .
4	Alprazolam	Xanax or zolam	Tab. 0.25 , 0.5

Any extra notes:

### 4.2-Antipsychotic drugs (for treatment of schizophrenia)

**Note:** Long-acting depot injections antipsychotic are used for maintenance therapy especially when compliance with oral treatment is unreliable. Depot

antipsychotics are administered by deep intramuscular injection at intervals of 1 to 4 weeks <sup>(2)</sup>.

### 1-Classification of the Antipsychotics

Antipsychotics have been broadly classified into two groups.

#### A-The older agents are referred to as typical or conventional antipsychotics.

1- They can also be classed by chemical structure (**phenothiazine** and **nonphenothiazine**).

2- common adverse effects (**extrapyramidal symptoms** (EPS), sedation, anticholinergic, and cardiovascular effects)

3- Examples of typical agents include haloperidol, fluphenazine, chlorpromazine, and thioridazine <sup>(6)</sup>.

4-Notes concerning **chlorpromazine**:

- It is used in the alleviation of **intractable hiccup** (شهيقة) <sup>(1)</sup>.

- **Important; Warning:** Owing to the risk of contact sensitization, pharmacists, nurses, and other health workers should avoid direct contact with chlorpromazine; tablets should not be crushed and solutions should be handled with care <sup>(2)</sup>.

5- Notes concerning **prochlorperazine**:

- Prochlorperazine is widely used in the **prevention and treatment of nausea and vomiting** <sup>(1)</sup>.

- Prochlorperazine also used for the symptomatic relief of **vertigo** <sup>(1)</sup>.

#### B-Atypical antipsychotics

1-Newer antipsychotics such as clozapine , risperidone, olanzapine and quetiapine are often referred to as atypical antipsychotics **because of their reduced tendency to cause the extrapyramidal effects** <sup>(1)</sup> (better tolerated than other antipsychotic drugs) <sup>(2)</sup>.

Antipsychotics(Both typical and Atypical antipsychotics)			
	Scientific name	Trade names	Dosage form
1	<b>Prochlorperazine</b>	<b>Stemtil</b>	Tab. 5 . Amp.
2	<b>Haloperidol</b>	<b>Haldo</b> <sup>(Janssen) , (Teva-UK)</sup>	Tab. 5 , 10 . cap. 0.5mcg
3	<b>Chlorpromazine</b>	<b>Largactil</b> <sup>(Sanofi-Aventis)</sup> )	Tab.25, 50 , 100 , amp.25mg/mL, syrup 25mg/mL
4	<b>Clozapine</b>	<b>Clozaril</b> <sup>(Novartis)</sup>	Tab. 25 , 100 .
5	<b>Olanzapine</b>	<b>Zyprexa</b> <sup>(Lilly)</sup>	Tab. 2.5 , 5, 7.5 , 10, 15, 20 .

6	<b>Quetiapine</b>	<b>Seroquel</b> <sup>(AstraZeneca)</sup> <b>Seroquel XL</b> <sup>(AstraZeneca)</sup>	Tab. 25 , 100 , 150 , 200, 300 .
<b>Any extra notes:</b>			
7	<b>Risperidone</b>	<b>Risperidal</b> <sup>(Janssen)</sup>	<b>tab. 0.5 , 1, 3 , 6 .</b>

### 4.3-Antidepressant drugs

The major classes of antidepressant drugs available in Iraq include the tricyclic and related antidepressants (TCAs), the selective serotonin re-uptake inhibitors (SSRIs).

#### 4.3.1- SSRIs

1-SSRIs include : Citalopram, escitalopram, fluoxetine, paroxetine, and sertraline.

2-SSRIs are generally chosen as first-line antidepressants because of their safety in overdose and improved tolerability compared with earlier agents <sup>(4)</sup>. The SSRIs produce fewer sedative, anticholinergic, and cardiovascular adverse effects than the TCAs and are less likely to cause weight gain than the TCAs <sup>(4)</sup>.

3-Important : In the treatment of depression the usual initial dose of fluoxetine is 20 mg once daily; US product information recommends giving this dose in the morning <sup>(1)</sup>.

4- Some SSRIs are also used as part of the management of generalised anxiety disorder, obsessive-compulsive disorder, panic disorders .  
Fluoxetine is also used in the treatment of premenstrual syndrome <sup>(1)</sup>.

5-The most common adverse effects associated with this class of agents include GI complaints, insomnia, restlessness, headache, and sexual dysfunction <sup>(5)</sup>.

SSRIs			
	Scientific name	Trade names	Dosage form
1	<b>Citalopram</b>	<b>Celax</b> <b>Cipramil</b> <sup>(Lundbeck)</sup>	Tab. 10, 20 ,40 , oral drop 40mg /mL
2	<b>Fluoxetine</b>	<b>Prozac</b> <sup>(Lilly)</sup>	Cap. 20 ,40, Liquid 20mg /5mL
3	<b>Sertraline</b>	<b>Zoloft</b> <b>Lustal</b> <sup>(Pfizer)</sup>	Tab. 50 , 100 .

**Any extra notes:**

### 4.3.2-TCAs and related antidepressants

1-Examples are Amitriptyline, Clomipramine, and Imipramine.

2-TCAs are antidepressants, **but their use has diminished because of the availability of equally effective therapies that are safer on overdose and better tolerated** <sup>(4)</sup>.

3-TCAs have  $\alpha$ -adrenergic blockade, antihistaminic effects, and anticholinergic effects, **which lead to orthostasis, sedation, and anticholinergic symptoms, respectively. They also lead to cardiotoxic effects** <sup>(5)</sup>.

4-Some TCAs are used in the management **treatment for Neuropathic pain, migraine prophylaxis, anxiety disorders and in nocturnal enuresis in children** <sup>(2,5)</sup>.

TCAs and related antidepressants			
	Scientific name	Trade names	Dosage form
1	<b>Imipramine</b>	<b>Tofranil</b>	Tab. 10 , 25 . Syrup 25mg/5mL
2	<b>Amitriptyline</b>	<b>Elavil</b> <b>Triptafen</b> (Mercury)	Tab.10 ,25, 50 . syrup. 25mg/5mL
3	<b>Trazodone</b>	<b>Desyrel</b> <b>Molipaxin</b> (Sanofi Aventis)	Cap. 50, 100, tab. 150 .

**Any extra notes:**

### 4.3.3-Serotonin Norepinephrine Reuptake Inhibitors (Duloxetine)

1-**Duloxetine** is used in the treatment of depression <sup>(1)</sup>.

2-Duloxetine is also used in the treatment of generalized anxiety disorder, treatment of diabetic peripheral neuropathic, and the treatment of moderate to severe stress urinary incontinence in women <sup>(1)</sup>.

Scientific name	Trade names(if available)	Dosage form
Venlafaxine	Effexor Epexor XL (Pfizer)	Cap. 75, 150 .

<b>Any extra notes:</b>		
Duloxetine	Cymbalta (Lilly)	cap. 30, 60 .

#### 4.4-Anti-obesity drugs acting on the GIT (Orlistat)

1-**Orlistat** is a gastric and pancreatic lipase inhibitor that limits the absorption of dietary fat <sup>(1)</sup>.

2-It is used together with dietary modification in the management of obesity , i.e. in **patients with a BMI of 30 kg/m<sup>2</sup> or greater**. It may also be used in overweight patients with a BMI of 27 kg/m<sup>2</sup> or more if there are associated risk factors (such as type 2 diabetes, hypertension) <sup>(1)</sup>.

3-Orlistat is given in a usual dose of 120 mg orally three times daily, **immediately before, during, or up to 1 hour after meals**. If a meal is missed or contains no fat, the dose should be omitted.

4-Orlistat therapy should be stopped if the patient does not lose at least 5% of their body-weight during the first 12 weeks of therapy <sup>(1)</sup>.

Scientific name	Trade names	Dosage form
Orlistat	Xenical	Cap. 60 , 120 .

<b>Any extra notes:</b>		
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#### 4.5-Drugs used in nausea and vertigo

1- See also **antiemetics in chapter one**.

2- 5HT<sub>3</sub>-receptor antagonists (like **ondansetron**) are of value in the management of **nausea and vomiting in patients receiving cytotoxics and in postoperative nausea and vomiting** <sup>(2)</sup>.

3-**Dexamethasone** has antiemetic effects and it is used in **vomiting associated with cancer chemotherapy**. It can be used alone or with metoclopramide, prochlorperazine, lorazepam, or a 5HT3 antagonist <sup>(2)</sup>.

4-**Betahistine** is an analogue of histamine and is licensed **for vertigo tinnitus, and hearing loss associated with Me´nie`re’s disease** <sup>(2)</sup>.

(Me´nie`re’s disease is a disorder of the inner ear that can affect hearing and balance to a varying degree. It is characterized by episodes of vertigo, low-pitched tinnitus, and hearing loss).

Scientific name	Trade names	Dosage form
<b>Betahistine</b>	<b>Betaserc</b> Serc <sup>(Abbot healthcare)</sup>	Tab. 8, 16
<b>Ondansetron</b>	<b>Zofran</b> <sup>(GSK)</sup>	Tab.4 , 8 , Syrup 4mg/5mL Amp.2mg/mL

**Any extra notes:**

## 4.6-Analgesics

### 4.6.1-non-steroidal anti-inflammatory drugs (NSAIDs).

See chapter Nine.

### 4.6.2-Paracetamol

1- Paracetamol has **analgesic and antipyretic** effects but no anti-inflammatory effect. Paracetamol is a suitable analgesic for **children** <sup>(2)</sup>.

2-**Over-dosage** with paracetamol is **particularly dangerous as it may cause hepatic damage** <sup>(2)</sup>.

3-Patient should be advised not to take **more than 1g ( usually 2 tablet of 500 mg) at any one time**. And **not take more than 8 tablets (4 gm) in 24 hours** <sup>(2)</sup>.

4-Compound analgesic preparations containing paracetamol with a low dose of an opioid analgesic (e.g. 8 mg of codeine phosphate per compound tablet) are commonly used, but the advantages have not been substantiated. The low dose of the opioid may be enough to cause opioid side-effects (in particular, constipation) and can complicate the treatment of overdose **yet may not provide significant additional relief of pain** <sup>(2)</sup>.

<b>Paracetamol(Compound analgesic preparations)</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Paracetamol (alone)</b>	<b>Panadol , Dilopran, Antipyrol</b>	Tab. 500 , 650 ,1000 . Syrup 120mg/5mL , drop100/20drop . Amp.100 ,375 ,300 .
2	<b>Paracetamol 350 , Caffeine 50 , Codeine 10 .</b>	<b>Algesic®</b>	Tab.
3	<b>Paracetamol , Ibuprofen , caffeine</b>	<b>No pain Novafen</b>	Cap. 350+200+40 .
4	Paracetamol , caffeine Propyphenozon	<b>Saridon</b> <sup>(Bayer healthcare)</sup>	Cap. 250 +50+150 .

<b>Any extra notes:</b>			
<b>5</b>	<b>Aceclofenac ,paracetamol</b>	<b>Actinac</b>	<b>tab. 100+ 500 .</b>
<b>6</b>	<b>Acetaminophen ,caffeine , A.S.A</b>	<b>Excedrin</b>	<b>tab. 250+65+250 .</b>

### 4.6.3-Opioid analgesics

1-Opioid analgesics are usually used to relieve moderate . **Repeated administration may cause dependence and tolerance** <sup>(2)</sup> .

2-Opioids such as codeine or dextropropoxyphene are used in the treatment of less severe pain, and are often combined with non-opioid analgesics such as aspirin, other NSAIDs, or paracetamol <sup>(1)</sup> .

3-More potent opioids such as morphine are used in severe acute and chronic pain, including cancer pain <sup>(1)</sup> .

4-Tramadol produces has fewer of the typical opioid side-effects (notably, less respiratory depression, less constipation and less addiction potential <sup>(2)</sup> .  
(Note: However, tramodaol is abused by some Iraqi addicts).

5-The most **common side-effects include nausea and vomiting** (particularly in initial stages), and **constipation** <sup>(2)</sup> .

6-Opioids should be used with **caution in patients with impaired respiratory function** (avoid in chronic obstructive pulmonary disease) and asthma (avoid during an acute attack) <sup>(2)</sup> .

<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>Tramadol</b>	<b>Tramal</b> <b>Zamadol</b> <sup>(Meda)</sup> <b>Tramquel</b> <sup>(Meda)</sup>	Cap. 50

Trabar

**Any extra notes:**

#### 4.6.4-Neuropathic pain

1-Neuropathic pain, occurs as a result of **damage to neural tissue** <sup>(2)</sup>.

2- Neuropathic pain is generally managed with a **tricyclic antidepressant** (e.g. Amitriptyline ) or with certain **antiepileptic drugs** ( carbamazepine, Gabapentin, and pregabalin) <sup>(2)</sup>.

3-Neuropathic pain may respond to **opioid analgesics** <sup>(2)</sup>.

#### 4.6.5-Antimigraine drugs

##### Treatment of acute migraine

1-Treatment of a migraine attack should be guided by response to previous treatment and the severity of the attacks. A simple analgesic such as aspirin, paracetamol (preferably in a soluble or **dispersible** form) or a NSAID is often effective <sup>(2)</sup>.

**(Peristalsis is often reduced during migraine attacks the medication may not be sufficiently well absorbed to be effective; dispersible or effervescent preparations are therefore preferred)** <sup>(2)</sup>.

2-Concomitant **antiemetic treatment may be required** <sup>(2)</sup> (e.g. cyclizine in migril®). (migraine attack is usually associated with nausea).

3-If treatment with an analgesic is inadequate, an attack may be treated with a specific antimigraine compound such as a 5HT<sub>1</sub>-receptor agonist ('triptan') (like **sumatriptan**) <sup>(2)</sup>.

4-The **value of ergotamine for migraine is limited by its side-effects**, it is best avoided <sup>(2)</sup>.

4-**Triptans** and **ergotamine** are **contra-indicated in ischemic heart disease** <sup>(2)</sup>.

**Note : Very important: The maximum recommended doses of ergotamine preparations should not be exceeded** ( should not exceed the maximum dose per attack, the maximum dose per day as well as the maximum dose per week).

<b>Triptans and ergotamine</b>				
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>	<b>Dose during migraine attack</b>
1	<b>Sumatriptan</b>	<b>Imigran</b> <sup>(GSK)</sup> Imigran Radi (GSK)	Tab.50 , 100 .	1-2 tab. At attack, 2 <sup>nd</sup> dose after 2hrs . max. dose 6 tab. In 24 hrs .
2	<b>Ergotamine tartarate</b>	<b>Migril</b> (Warkhardt)	Tab. 2mg Caffeine 100mg Cyclizine 50mg	1 tab. At attack, 2 <sup>nd</sup> dose after 30 min. max. dose 3tab. In 24 hrs , max. dose 6 tab. In week

**Any extra notes:**

### **Prophylaxis of migraine**

1-Where migraine attacks are frequent, preventive treatment for migraine should be considered <sup>(2)</sup>.

2-drugs that are used for **Prophylaxis of migraine include:**

**A-The beta-blockers (e.g. Propranolol is the most commonly used) <sup>(2)</sup>.**

**B-Tricyclic antidepressants, and antiepileptics (topiramate, sodium valproate, valproic acid, and gabapentin ) are also effective for preventing migraine <sup>(2)</sup>.**

**C-Pizotifen is of limited value and may cause weight gain <sup>(2)</sup>.**

<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>Pizotifen</b>	<b>Sanomigran</b> <sup>(Novartis)</sup>	Tab. 0.5 , 1.5 Elixir 0.25mg/5mL Syrup 0.25mg/5mL

**Any extra notes:**

### **4.7-Antiepileptic drugs (AEDs)**

1-Example of some antiepileptic drugs available in Iraq are:

**Carbamazepine , Gabapentin , Lamotrigine , Levetiracetam , Phenytoin , Pregabalin , Topiramate , and Valproate .**

2-The choice of an AED depends on the **seizure type, potential for drug interactions and side effects, cost and physician familiarity with the drug** <sup>(7)</sup>.

3- Usually **therapy is initiated at low dose and gradually increased** over 3 or 4 weeks to an effective dose <sup>(4)</sup>.

4- One chronic adverse effect that is of concern is **osteoporosis**. Carbamazepine, phenytoin, Phenobarbital , and valproate have all been shown to decrease bone mineral density, even after only 6 months of treatment. **Patients taking these drugs for longer than 6 months should take supplemental calcium and vitamin D** <sup>(8)</sup>.

5- AEDs are associated with many different drug interactions:

**A-Phenobarbital, phenytoin, and carbamazepine are potent inducers** of various CYP-450 isoenzymes, increasing the clearance of other drugs metabolized through these pathways.

**B-Valproic acid inhibits many hepatic enzyme systems** <sup>(4, 8)</sup>.

<b>Antiepileptic drugs</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Carbamazepine</b>	<b>Tegretol</b> <sup>(Novartis)</sup>	Tab.100, 200, 400, syrup 100mg/5mL, supp125mg
2	<b>Gabapentin</b>	<b>Neurontin</b> <sup>(Pfizer)</sup>	Cap.100, 300,400
3	<b>Pregabalin</b>	<b>Lyrica</b> <sup>(Pfizer)</sup>	Cap.25,50,75 . Syrup 20mg/mL
4	<b>Lamotrigine</b>	<b>Lamictal</b> <sup>(GSK)</sup>	Tab.25,50,75,100,200
5	<b>Phenobarbital</b>	<b>Luminal</b>	Tab.15,30,60 . Amp.200/mL Elixir 15mg/5mL
6	<b>Sodium Valproate</b>	<b>Depakine</b> <b>Epilim</b> <sup>(Sanofi-Aventis)</sup>	Tab.100,200 Syrup 200mg/5mL

**Any extra notes:**

## 4.8-Drugs used in parkinsonism

1-The primary objective of drug therapy is to enhance dopaminergic activity within the damaged areas of the basal ganglia, and this is achieved in various ways (see table below) <sup>(3)</sup>.

Pharmacological rationales for enhancing dopaminergic transmission in the basal ganglia		
Approach	Rationale	Drug group and examples
Reduce cholinergic activity	Balance diminished dopaminergic activity	Antimuscarinic, e.g. trihexyphenidyl (benzhexol), procyclidine
Inhibit neuronal dopamine re-uptake	Maximize remaining dopaminergic activity	Amantadine
Stimulate dopamine receptors	Mimic dopamine	Dopamine agonist: <ul style="list-style-type: none"> <li>• Ergot derived: cabergoline, pergolide, lisuride, bromocriptine</li> <li>• Non-ergot derived: ropinirole, rotigotine, pramipexole</li> <li>• Other: apomorphine</li> </ul>
Supply dopamine precursor	Increase dopamine level in basal ganglia	Levodopa
Reduce peripheral destruction of precursor	Increase levodopa penetration into brain	Decarboxylase inhibitor, e.g. carbidopa, benserazide COMT-inhibitor: entacapone, tolcapone
Reduce central destruction of dopamine	Increase dopamine half-life in brain	COMT-inhibitor: tolcapone MAO-B inhibitor, e.g. selegiline, rasagiline

MAO-B, monoamine oxidase-B; COMT, catechol-O-methyl transferase.

Antiparkinsonian drugs			
	Scientific name	Trade names	Dosage form
1	<b>Bromocriptine</b>	<b>Parlodel</b> <sup>(Meda , Novartis)</sup>	Tab. 2.5 , 1.25
2	<b>Levodopa/ carbidopa</b>	<b>Sinemet</b> <sup>(MSD)</sup>	Tab.50/12.5 , 100/10, 100/25
3	<b>Procyclidine</b>	<b>Kemadrin</b> <sup>(Aspen)</sup>	Tab.5
4	<b>Orphenadrine</b>	<b>Biorphen</b> <sup>(Alliance)</sup> <b>Disipal</b> <sup>(Astellas)</sup>	Syrup 25mg/mL, S.R tab.50mg

**Any extra notes:**

## 4.9-Drugs for smoking cessation

Nicotine replacement therapy (NRT), bupropion, and varenicline are effective aids to smoking cessation <sup>(2)</sup>.

### 4.9.1- Bupropion

1- Bupropion is an antidepressant drug <sup>(1)</sup>.

2-For smoking cessation, treatment should be **started about 1 to 2 weeks before the patient attempts to stop smoking**, to allow steady-state blood levels of bupropion to be reached, and normally continues for 7 to 12 weeks; if there is no significant progress towards smoking abstinence by the seventh week, then therapy should be stopped <sup>(1)</sup>.

### 4.9.2- Varenicline

1- Varenicline is a selective nicotinic receptor partial agonist that is used as an aid for smoking cessation <sup>(1)</sup>.

2- Patients are advised to set a date to stop smoking and **start varenicline 1 to 2 weeks before**. Treatment is normally given for 12 weeks; in patients who successfully stop smoking, a further 12 weeks of treatment has been recommended to reduce the risk of relapse <sup>(1)</sup>.

### 4.9.3-NRT

1-**The first-line pharmacological intervention is NRT** <sup>(1)</sup>.

2-NRT is available in numerous formulations: chewing gum, transdermal patches, inhalators, nasal sprays, sublingual tablets, and lozenges <sup>(1)</sup>.

3-Choice of formulation is based on patient preference, tolerance, and previous treatments, if any.

A-The **transdermal patch is easiest to use and compliance is greatest** with this route but local effects may be troublesome.

B-The **gum** has an unpleasant taste initially and some find the chewing action difficult.

C-The **sublingual tablet may be useful for those who have difficulty chewing the gum**.

D-The **nasal spray has a fast onset of action** but may cause local irritation.

E-The **inhalator has the advantage of simulating cigarette smoking** but may cause local irritation of the mouth and throat. The lozenge has the advantage that it can be sucked discreetly <sup>(1)</sup>.

4-NRT for smoking cessation is usually continued for about 3 months before being withdrawn<sup>(1)</sup>.

Drugs for nicotine dependence (if available)			
	Scientific name	Trade names	Dosage form
1	<b>Bupropion</b>	<b>Zyban</b> <sup>(GSK)</sup>	S.R tab. 150
2	<b>Nicotine</b>	<b>Nicotinell</b> <sup>(Novartis)</sup> <b>Niquitin</b> <sup>(GSK)</sup>	Chewing gum 2mg, 4mg . Mint lozenge 1mg ,2mg .
3	<b>Varenicline</b>	<b>Champix</b> <sup>(Pfizer)</sup>	Tab. 0.5 , 1 .

**Any extra notes:**

#### 4.10-Drugs for dementia

1-In dementia, there is a deterioration memory, judgement, language and communication. **Alzheimer's disease is the most common cause of dementia and accounts for over half of all patients; about one-third of dementia cases are due to vascular disease**<sup>(1)</sup>.

2-**Donepezil, galantamine, and rivastigmine** are the main *cholinesterase inhibitors*. All have produced modest improvement in patients with mild to moderately severe disease<sup>(1)</sup>. Acetylcholinesterase inhibitors **can cause unwanted cholinergic side-effects**<sup>(2)</sup>.

3-**Memantine** is a glutamate receptor antagonist; it is licensed for treating moderate to severe Alzheimer's disease<sup>(2)</sup>.

Drugs for dementia			
	Scientific name	Trade names	Dosage form
1	<b>Donepezil</b>	<b>Aricept</b> <sup>(Eisai)</sup>	Tab.5, 10 .
2	<b>Galantamine</b>	<b>Reminyl</b> <sup>(shire)</sup>	Tab. 8, 12 . Syrup 4mg/ mL
3	<b>Rivastigmine</b>	<b>Exelon</b> <sup>(Novartis)</sup>	Cap. 1.5 ,3 , 4.5 , 6 . Syrup 2mg/mL

**Any extra notes:**

## **References**

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6-For the eradication of *H. pylori* (a bacteria that cause ulcer), **amoxicillin is given with clarithromycin and a proton pump inhibitor**; usual doses of amoxicillin for the eradication of *H. pylori* is **1 g twice daily** (or less commonly 500 mg three times daily) <sup>(1, 2)</sup>.

<b>Penicillins</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Amoxicillin</b>	<b>Amoxil</b> <sup>(GSK)</sup>	Cap.250, 500, tab.1000 , susp.125/5mL , 250/5mL
2	<b>Co-amoxiclave</b>	<b><u>Augmentin</u></b> <sup>(GSK)</sup>	Tab.625 , 375, 800,1000 , susp. 312.5/5mL ,457/5mL
3	<b>Ampicillin- cloxacillin</b>	<b>Ampiclox</b>	Cap.(250+250) , vial 500 , susp. 250/5mL
4	<b>Ampicillin</b>	<b>Penbritin</b> <sup>(Chemidex)</sup> Ampicillin	Cap.250 , 500, susp. 250/5mL
5	<b>Benzathine Penicillin</b>	<b>Troge</b>	Vial 1.2 mega/2mL

**Any extra notes:**

## 5.1.2-Cephalosporins

### 1-Classification

	<b>Groups</b>	<b>Examples</b>
1	<b>First-generation</b>	<b>Cefalexin and cefadroxil</b>
2	<b>Second -generation</b>	<b>Cefuroxime</b>
3	<b>Third-generation</b>	<b>Cefotaxime, ceftazidime ceftriaxone, cefixime, cefepodoxime</b>
4	<b>Fourth-generation</b>	<b>Cefepime</b>

2-In general the activity against gram negative bacteria is increase and the activity against gram positive bacteria is decrease when we move from first to third generations cephalosporins.

3-Some important properties for specific agents <sup>(1)</sup>:

<b>Drug</b>	<b>Properties</b>
<b>Ceftriaxone</b>	Has a <i>longer half-life</i> ( may be given <i>once daily</i> ).
<b>Ceftazidime</b>	Has good activity <i>against pseudomonas</i> .
<b>Cefixime</b>	<i>Oral</i> third-generation cephalosporin.
<b>Cefepodoxime</b>	<i>Oral</i> third-generation cephalosporin (must be given <i>after food</i> ).

4-The principal side-effect of the cephalosporins is **hypersensitivity** and about 0.5–6.5% of penicillin-sensitive patients will also be allergic to the cephalosporins.

**Patients with a history of immediate hypersensitivity to penicillin should not receive a cephalosporin (contraindicated) <sup>(1)</sup>.**

5-Note : **important**: when given by an intravenous injection, most of these drugs should be **given over at least 2–4 minutes** ( **arrhythmias** following rapid injection reported) <sup>(1)</sup>.

وقد سجلت العديد من حالات الوفيات في العراق نتيجة الإعطاء الوريدي السريع لدوائي :

**Cefotaxime, and ceftriaxone**

<b>Cephalosporins</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Cefalexin</b>	<b><u>Keflex</u></b> <sup>(Flynn)</sup>	Cap. 250 , 500, Susp. 125/5mL , 250/5mL
<b>2</b>	<b>Cefotaxime</b>	<b>Claforan</b>	Vial . 0.5g , 1g
<b>3</b>	<b>Ceftriaxone</b>	<b>Ceftriaxone , Rocephin</b> <sup>(Roche)</sup>	Vial . 0.25g , 0.5g ,1g .
<b>4</b>	<b>Cefixime</b>	<b><u>Suprax</u></b> <sup>(Sanofi-Aventis)</sup>	Cap. 100 , 200 , 400 . Susp. 100/ 5mL
<b>5</b>	<b>Cefpodoxime</b>	<b>Orebx</b> <sup>(Sanofi-Aventis)</sup> <b><u>Cefodox</u></b> <b>Also infex .</b>	Tab. 100 , 200 , susp. 50/5mL Susp.100/5mL
<b>6</b>	<b>Cefdinir</b>	Omnicef , <b>Sefarin</b> <sup>(pharma international)</sup>	Susp. 125/5mL Tab. 300mg .

Cefuroxime

**Zamur**

**Any extra notes:**

### **5.1.3-Carbapenems (imipenem, meropenem)**

1- The carbapenems are beta-lactam antibacterials with a broad-spectrum of activity which includes many Gram positive and Gram-negative bacteria, and anaerobes <sup>(1)</sup>.

2-Imipenem is partially inactivated in the kidney by enzymatic activity and is therefore administered in combination with cilastatin, a specific enzyme inhibitor, which blocks its renal metabolism.

<b>Carbapenems</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Imipenem</b>	<b>Primaxin</b> <sup>(MSD)</sup>	I.V infusion vial 500mg
2	<b>Meropenem</b>	<b>Meronem</b> ® <sup>(AstraZeneca)</sup>	500-mg and 1-g vial

**Any extra notes:**

### 5.1.4-Tetracyclines (like Tetracycline, and Doxycycline)

1-**Doxycycline has longer duration than tetracycline** and may be **given once or twice daily**.

2-Important : **Oral administration:**

A-**Tetracycline** must be given on an empty stomach (**This means an hour before food or 2 hours after food**) while **Doxycycline** is **given during meals** <sup>(1)</sup>.

B- Capsules (of both drugs) should be swallowed **whole with plenty of fluid while sitting or standing** <sup>(1)</sup> (because it may **cause oesophageal irritation**).

3-**Deposition of tetracyclines in growing bone and teeth** (by binding to calcium) causes staining, and they should not be given to **children** under 12 years, or to **pregnant or breast-feeding** women <sup>(1)</sup>.

4- Common indications for doxycycline include: **genital Chlamydia, acne, and brucellosis** (in combination with rifampicin) <sup>(1)</sup>.

<b>Tetracyclines</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Doxycycline</b>	<b>Vibramycin-D</b> <sup>(Pfizer)</sup>	Cap.100 , 500 .
2	<b>Tetracycline</b>	<b>Sumycin</b>	Cap.250 , 500 , Skin oint.3% ,eye 1%

**Any extra notes:**

### 5.1.5-Aminoglycosides

1- These include amikacin, gentamicin, neomycin, streptomycin, and tobramycin <sup>(1)</sup>.

2- The aminoglycosides are **not absorbed from the gut** and must therefore be given **by injection for systemic infections** <sup>(1)</sup>.

3-The important side-effects are **ototoxicity, and nephrotoxicity** <sup>(1)</sup>.

4-**Streptomycin** is used mainly for **tuberculosis** (2<sup>nd</sup> line drug) and for **brucellosis** <sup>(1)</sup>.

<b>Aminoglycosides</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Amikacin</b>	<b>Amikin</b> <sup>(Bristol-Myer-Squibb)</sup>	Vial 100 , 500 .
2	<b>Gentamycin</b>	<b>Garamycin</b> , <b>Genticin</b> <sup>(Amdipharm)</sup> <b>Cidomycin</b> <sup>(SAnofi-Aventis)</sup>	Amp.80/2mL ,40/2mL Eye drop 0.3%
3	<b>Tobramycin</b>	<b>Tobrex</b> <b>Tobi</b> <sup>(Novartis )</sup>	Eye ointment 0.3% Nebulizer sol. 60/mL
4	<b>Streptomycin</b>	<b>Streptomycin</b>	Vial 1g

**Any extra notes:**

### 5.1.6- Macrolides

1- These include Erythromycin, Azithromycin and Clarithromycin <sup>(1)</sup>.

2- Azithromycin has a long half-life and **once daily dosage** is recommended <sup>(1)</sup>.

3-**Important** : Azithromycin capsules must be given on an **empty stomach (an hour before food or 2 hours after food)** while Azithromycin tablet and suspension are given **without regard to meal** <sup>(1)</sup>.

4-Clarithromycin is usually given twice daily. And it is one of the **component of triple therapy for eradication of *H. pylori*** (a bacteria that cause ulcer) <sup>(1)</sup>.

<b>Macrolides</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Azithromycin</b>	<b>Zithromax</b> <sup>(Pfizer)</sup>	Tab. Or cap. 250 , 500, Susp.40/mL
2	<b>Clarithromycin</b>	<b>Biaxin</b> <b>Kloricid</b> <sup>(Abbott healthcare)</sup>	Tab.250 ,500 Susp.125/5mL
3	<b>Erythromycin</b>	<b>Erythrocin</b> <sup>(Amdipharm)</sup> <b>Erymax</b> <sup>(Cepholon )</sup>	Tab.500, cap.250 , susp.200/5mL

**Any extra notes:**

### 5.1.7-Quinolones

1- These include Nalidixic acid, Norfloxacin, Ciprofloxacin, Gatifloxacin, Ofloxacin, Levofloxacin, Moxifloxacin <sup>(1, 2)</sup>.

2- **Ciprofloxacin** is the drug of **choice for typhoid fever** <sup>(1)</sup>.

3- **Nalidixic acid** is used mainly in the treatment of lower urinary-tract infections <sup>(1)</sup>. (It should be **avoided in infants less than 3 months old**) <sup>(1, 2)</sup>.

#### 4- Administration

A- Norfloxacin should be taken on an empty stomach <sup>(1)</sup>.

B- **Important:** Ciprofloxacin and Norfloxacin should not be taken with **Dairy products** (interfere with the absorption) <sup>(1, 2)</sup>.

5- Quinolones cause acute **haemolytic anaemia** when taken by individuals with Glucose 6-phosphate dehydrogenase (**G6PD**) **deficiency** <sup>(1)</sup>.

6-One disadvantage of the quinolone antibacterials is that they are generally not recommended for use in **children, adolescents, and pregnant or breast-feeding** women because of their propensity to cause **joint erosions in immature animals** <sup>(2)</sup>.

Quinolones			
	Scientific name	Trade names	Dosage form
1	<b>ciprofloxacin</b>	<b>Cipro , Ciproxin</b> <sup>(Bayer)</sup>	Tab.250 , 500 , 750 Susp.250/5mL
2	<b>Nalidixic acid</b>	<b>Neggram</b> <b>Nalidixic acid</b> <sup>(Rosemont)</sup>	Tab.500 , susp.300/5mL
3	<b>Norfloxacin</b>	<b>Noroxin</b> <b>Utinor</b> <sup>(MSD)</sup>	Tab. 400 ,eye&ear drop 0.3%
4	<b>Ofloxacin</b>	<b>Floxin</b> <b>Tarivid</b> <sup>(Sanofi-Aventis)</sup>	Tab.200 , 400 Eye drop 0.3%
5	<b>Levofloxacin</b>	<b>Levaquin</b> <b>Tavonic</b>	Tab. 250 ,500
<b>Any extra notes:</b>			
6	<b>Moxifloxacin</b>	<b>Avelox</b> <sup>(Bayer)</sup>	tab.400

### 5.1.8-Lincosamides (lincomycin and clindamycin)

1- Active against **Gram-positive cocci, and also against many anaerobes** <sup>(1)</sup>. The main indication for the use of lincosamides is now in the treatment of **severe anaerobic infections** <sup>(2)</sup>.

2- **Clindamycin is much better absorbed from the GIT than lincomycin.** They both penetrate well **into bone** and have been used successfully in osteomyelitis <sup>(2)</sup>.

3-The capsules should be **taken with a glass of water** <sup>(2)</sup>.

4-They have also been **used topically in the treatment of acne vulgaris** <sup>(2)</sup>.

**5-Important : Patients should discontinue immediately and contact doctor if diarrhoea develops** <sup>(1)</sup> (Lincosamides are reported to produce diarrhoea. In some patients severe antibiotic-associated or pseudomembranous colitis may develop during therapy or up to several weeks after it, and has proved fatal) <sup>(2)</sup>.

Lincosamides			
	Scientific name	Trade names	Dosage form
1	<b>Clindamycin</b>	<b>Cleocin</b> <b>Dalacin C</b> (pharmacia)	Cap.150 , gel or sol. 1%
2	<b>Lincomycin</b>	<b>Lincocin</b> (Pfizer)	Cap.500, Vial 300/2mL , 600/2mL syrup 250/5mL

**Any extra notes:**

### 5.1.9-Sulfonamides and trimethoprim

1- **Sulfamethoxazole and trimethoprim** are used in combination (as co-trimoxazole) because of their **synergistic activity** <sup>(2)</sup>. *Trimethoprim* is also used alone particularly in the treatment of infections of the urinary and respiratory tracts <sup>(2)</sup>.

2-Co-trimoxazole should **not generally be given to infants below 6 weeks of age because of the risk of kernicterus** <sup>(2)</sup>. Co-trimoxazole should be **avoided by people with G6PD deficiency** <sup>(2)</sup>.

	Scientific name	Trade names	Dosage form
1	<b>Co-trimoxazole</b>	<b>Bactrim</b> or <b>Methoprim</b> <b>Septin</b> (Aspen)	Tab.(80+400), tab.fort (160+800),susp. 40+200/5mL

**Any extra notes:**

### 5.1.10-Rifampicin

1-It is used mainly for **Tuberculosis** (in combination with other antituberculosis drugs : isoniazid, ethambutol and pyrazinamide) and **Brucellosis** ( in combination with doxycycline for 6 weeks).

2-It must be taken **30 to 60 minutes before food** <sup>(1)</sup>.

3-**Important : Rifampicin causes a harmless orange-red discoloration** of the urine, faeces, sweat, saliva, sputum, tears, and other body fluids <sup>(2)</sup>.

	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Rifampicin</b>	<b>Rifadin</b> <sup>(Sanofi-Aventis)</sup> <b>Rimactane</b> <sup>(Sandoz)</sup>	Cap.150 , 300 ,450 . Susp. 2g/100mL

**Any extra notes:**

### 5.1.11-Nitrofurantoin

1-Nitrofurantoin is used in the treatment and **prophylaxis urinary-tract infections (UTI)** <sup>(2)</sup>.

2-It is given orally, **with food or milk** <sup>(2)</sup>.

3-**Important: Any prophylactic dose of antibiotic for UTI should be given at bedtime** <sup>(2)</sup>.

4-Nitrofurantoin may cause a **brownish discoloration of the urine** <sup>(2)</sup>.

	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Nitrofurantoin</b>	<b>Macrobid</b> <b>Furadantin</b> <sup>(Mercury)</sup>	Cap.100 , susp. 25/5mL

**Any extra notes:**

### 5.1.12-Metronidazole and tinidazole

1- They are active against **anaerobic bacteria** and **protozoa** (Entamoeba histolytica, giardia lamblia). **Tinidazole is similar to metronidazole but has a longer duration of action** <sup>(2)</sup>.

2-Metronidazole and tinidazole tablets **are taken with or after food** <sup>(1, 2)</sup>.

3- **Tinidazole may be given as a single dose of 2 g (4 tablets) for some vaginal and GIT infections** <sup>(2)</sup>.

4-They can produce **nausea and an unpleasant metallic taste** <sup>(2)</sup>.

5-When given with **alcohol**, metronidazole and tinidazole may provoke a **disulfiram-like reaction in some patients** <sup>(2)</sup>.

	Scientific name	Trade names	Dosage form
1	<b>Metronidazole</b>	<b>Flagyl</b> <sup>(Winthrop)</sup> <b>Metrolyl</b> <sup>(Sandoz)</sup>	Tab.200,250,500 ,supp.500 , susp.125/5mL ,infusin 5/1mL
2	<b>Tinidazole</b>	<b>Tindamax</b> <b>Fasigyn</b> <sup>(Pfizer)</sup>	Tab.500 .

**Any extra notes:**

### 5.1.13-Other antibacterials

1- **Vancomycin** and **teicoplanin**: which are active against aerobic and anaerobic Gram-positive bacteria including multi-resistant staphylococci <sup>(1)</sup>.

2-**Fusidic acid** : The only indication for their use is in infections caused by penicillin-resistant staphylococci <sup>(1)</sup>.

	Scientific name	Trade names	Dosage form
1	<b>Vancomycin</b>	<b>Vancocin</b> <sup>(Flynn)</sup>	Cap.125 .
2	<b>Fusidic acid</b>	<b>Fucidin</b> <sup>(LEO)</sup>	Tab. 250,susp. 250/5mL , eye oint.

**Any extra notes:**

## 5.2-Antifungal drugs

1-Examples of antifungal drugs available in Iraq are (Amphotericin B, Griseofulvin, fluconazole , Itraconazole, ketoconazole and nystatin ).

2- Fluconazole 150 mg as a single oral dose may be used for vaginal candidiasis <sup>(2)</sup>.

### 3-Important:

A-Griseofulvin is contra-indicated in pregnancy and women **should not become pregnant during, or within 1 month of stopping therapy.** also **men should avoid fathering a child during and for at least 6 months after administration** <sup>(1, 2)</sup>.

B-Absorption of griseofulvin from the GIT is enhanced by reducing the particle size or when given **with a fatty meal** (should be given with or after meals) <sup>(2)</sup>.

C- **Duration of therapy is dependent on the site of the infection and may extend to a number of months** <sup>(1)</sup> (2 to 8 weeks for infections of the hair and skin, up to 6 months for infections of the fingernails, and 12 months or more for infections of the toenails) <sup>(2)</sup>.

4-Nystatin is used for oral, oropharyngeal, and perioral infections by **local application** in the mouth <sup>(1)</sup> (will be discussed later). And it may be given orally for the treatment of intestinal candidiasis <sup>(2)</sup>.

5- Itraconazole and ketoconazole must be given after food <sup>(2)</sup>.

6-The use of ketoconazole may be restricted due to the risk of hepatotoxicity (reported very rarely).

Antifungal drugs			
	Scientific name	Trade names	Dosage form
1	<b>Fluconazole</b>	<b>Diflucan</b> <sup>(Pfizer)</sup>	Cap.150 .
2	<b>Itraconazole</b>	<b>Sporanox</b> <sup>(Janssen)</sup>	Cap.100 .
3	<b>Ketoconazole</b>	<b>Nizoral</b> <sup>(Janssen)</sup>	Tab.200 , cream 2% , shampoo 2%
4	<b>Miconazole</b>	Fungoid , <b>Daktarin</b> <sup>(Janssen)</sup>	Oral gel ,vag. Cream , vag. Supp. 200 , 400
<b>Any extra notes:</b>			
5	<b>Clotrimazole</b>	<b>Lotrimin</b>	<b>cream 1%</b>
6	<b>Nystatin</b>	<b>Mycostatin</b>	<b>oral susp. , tab. , vag.Tab.</b>

### 5.3-Antiviral drugs

1-The most common Antiviral drug used in Iraq is **Aciclovir** (Acyclovir) (for **Herpes simplex and varicella– zoster infection**).

2- Aciclovir is usually **given 5 times daily** (every 4 hours for 5 times ) .

	Scientific name	Trade names	Dosage form
1	<b>Aciclovir</b>	<b>Zovirax</b> <sup>(GSK)</sup>	Tab. 200 , 400 ,800, eye oint.3% , skim oint. 5%

**Any extra notes:**

### 5.4-Anthelmintics

1- The most common anthelmintics drugs available in Iraq are **mebendazole and albendazole**.



2-For the treatment of pinworms (*Enterobius vermicularis*):

A- Mebendazole is the drug of choice for treating threadworm infection in patients of all ages over 2 years. **It is given as a single dose of 100 mg**; as reinfection is very common, **a second dose may be given after 2 weeks** <sup>(1)</sup>.

B- **Albendazole** may also given as a single dose of **400 mg**; as reinfection is very common, **a second dose may be given after 2 weeks**.

3-In the treatment of **echinococcosis (hydatid disease)**, albendazole is given orally with meals in a dose of **400 mg twice daily for 28 days**, the 28-day course may be repeated after 14 days without treatment (treatment may need to continue for months or years) <sup>(1)</sup>.

4-Mebendazole is effective against **Ascaris lumbricoides** and is generally considered to be the drug of choice; **the usual dose is 100 mg twice daily for 3 days** <sup>(1)</sup>.

الملاحظ في العراق مع الأسف الشديد إن هذه الجرعة تستخدم لعلاج الديدان الدبوسية أيضا في حين إن الجرعة المنصوصة هي جرعة واحدة فقط تعاد بعد أسبوعين كما في النقطة رقم 2 أعلاه.

Anthelmintics			
	Scientific name	Trade names	Dosage form
1	<b>Albendazole</b>	<b>Albenza</b>	Tab. 200, 400, susp. 20/1mL
2	<b>Mebendazole</b>	<b>Vermox</b> <sup>(Janssen)</sup>	Tab. 100, susp. 100/5mL

**Any extra notes:**

## 5.5-Antiprotozoal drugs

### 5.5.1-Amoebicides

1- Amoebicides (Metronidazole, Tinidazole ( discussed previously) and **Diloxanide furoate**.

2- **Diloxanide furoate**, is a **luminal amoebicide** acting principally in the bowel lumen and is used in the treatment of intestinal amoebiasis. **It is given alone in the treatment of asymptomatic cyst passers** (patients with *E. histolytica* cysts in the faeces ) and with an amoebicide that acts in the tissues, such as metronidazole, in patients with invasive amoebiasis <sup>(1, 2)</sup> and the usual **course is of 10 days** <sup>(2)</sup>.

3-**Flatulence** is the most common adverse effect during treatment with diloxanide furoate <sup>(2)</sup>.

	Scientific name	Trade names (alone or combined with Metronidazole)	Dosage form
1	<b>Diloxanide furoate</b> Metronidazole ,Diloxanide furoate	<b>Diloxanide</b> <sup>(Sovereign)</sup> <b>Dilozole</b>	Tab.500 . Susp. 100+100 , Tab. 250 +250 .

### 5.5.2-Drugs for toxoplasmosis (Spiramycin)

1- Congenital toxoplasmosis is not a problem in women who have *Toxoplasma* antibody before conception <sup>(2)</sup>. **If toxoplasmosis is acquired in pregnancy, transplacental infection may lead to severe disease in the fetus** <sup>(1)</sup>.

2- Spiramycin may reduce the risk of transmission of maternal infection to the fetus <sup>(1)</sup>.

Scientific name	Trade names	Dosage form
<b>Spiramycin</b>	<b>Rovamycine</b> <sup>(Sanofi-Aventis)</sup>	Tab. 1.5M.I.U , 3M.I.U .

### 5.5.3-Leishmaniacides

1-**Sodium stibogluconate (Pentostam®)**, is used for visceral leishmaniasis (kala-azar) and for extensive Cutaneous leishmaniasis <sup>(1)</sup>.

2- It is given by injection (usually I.M) **for 28 days in visceral leishmaniasis** and for 20 days in cutaneous infection <sup>(1)</sup>.

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## Chapter Six : endocrine system

### 6.1-Drugs used in diabetes

#### 6.1.1-Oral Antidiabetics

**Note:** they are given for **type II diabetes**.

#### 1-Classification and administration with respect to food <sup>(1, 2)</sup> :

	Groups	Example(s)	Administration
<b>1</b>	<b>Sulphonylureas</b>	Glibenclamide, Gliclazide, Glimepiride	With food
<b>2</b>	<b>Biguanides</b>	Metformin	Take with or just after food
<b>3</b>	<b>dipeptidylpeptidase-4 inhibitors</b>	Sitagliptin, Saxagliptin, Vildagliptin	Without regard to meal
<b>4</b>	<b>Thiozolidinediones</b>	Pioglitazone	Without regard to meal
<b>5</b>	<b>Meglitinides</b>	Nateglinide, Repaglinide	Within 30 minutes before meals
<b>6</b>	<b>Alpha-glucosidase inhibitor</b>	Acarbose	Tablets should be chewed with first mouthful of food or swallowed whole with a little liquid immediately before food.

#### 2- Adverse effects:

A-The primary side effects of the **sulphonylureas** are **hypoglycemia and weight gain** ( about 2 kg) <sup>(2)</sup>.

B- The primary side effects of **metformin GIT disturbances** (anorexia, nausea, vomiting, and diarrhea); and there may **be weight loss** <sup>(3)</sup>. To minimize GI side effects, metformin should be initiated at 500 mg once or twice daily, to be taken with food, followed by weekly or biweekly increases in increments of 500 mg daily <sup>(2)</sup>.

C-**Hypoglycaemia is rare with a biguanide given alone**, although it may occur if other contributing factors or drugs are present <sup>(3)</sup>.

D-The most commonly reported side effects with **dipeptidylpeptidase-4 inhibitors is the increased risk of infection** <sup>(2)</sup>.

3- **Metformin is the first line of therapy for type 2 diabetes** <sup>(2)</sup>. Because metformin is **not associated with weight gain, it is preferred in obese patients** <sup>(3)</sup>.

4- **Important : Metformin** is used for the symptomatic management of **polycystic ovary syndrome [PCOS]**. Metformin helps to normalise menstrual cycle (increasing the rate of spontaneous ovulation), and may improve hirsutism<sup>(1)</sup>.

5-Note: there are many products that contain a combination of oral antidiabetic drugs (e.g. **Glucovance®** which contain a combination of **Metformin and Glibenclamide**).

<b>Oral Antidiabetics (including combined products)</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Glibenclamide</b> (called Glyburide in USA)	<b>Daonil</b>	Tab. 2.5, 5
<b>2</b>	<b>Metformin</b>	<b>Glucophage</b> <sup>(Merck Serona)</sup>	Tab.500 ,850 , 1000,
<b>3</b>	<b>Glimepiride</b>	<b>Amaryl</b> <sup>(Sanofi Aventis)</sup>	Tab. 1, 2, 3, 4 .
<b>4</b>	<b>Gliclazide</b>	<b>Diamicron</b> <sup>(Servier)</sup>	Tab. 40 , 80 . S.R Tab.30
<b>5</b>	<b>Repaglinide</b>	<b>Prandin</b> <sup>(Daiichi Sanko)</sup>	Tab. 0.5 ,1 , 2 .
<b>6</b>	<b>Saxagliptin</b>	<b>Onglyza</b> <sup>(Bristol-Myeri squilbb)</sup>	Tab. 2.5 , 5 .
<b>7</b>	<b>Glipizide</b>	<b>Glvtrol</b> <b>Minodiab</b> <sup>(pharmacia)</sup>	Tab.5 .

**Any extra notes:**

### 6.1.2-Insulins

1- Therapy with insulin is essential for the long-term survival of **all patients with type 1 diabetes mellitus**<sup>(3)</sup>. It is also needed **for type 2 diabetes when other methods have failed to achieve good control**, and temporarily in the presence of **intercurrent illness** or **peri-operatively**. **Pregnant women with type 2 diabetes** may be treated with insulin<sup>(1)</sup>.

2-The most frequent **complication of insulin therapy is hypoglycaemia**. It is usually associated with an excessive dosage of insulin, or the omission of a meal by the patient<sup>(3)</sup>.

3-The various formulations of insulin are classified, according to their **duration of action** after subcutaneous injection, as **short-, intermediate-, or long-acting**<sup>(3)</sup>.

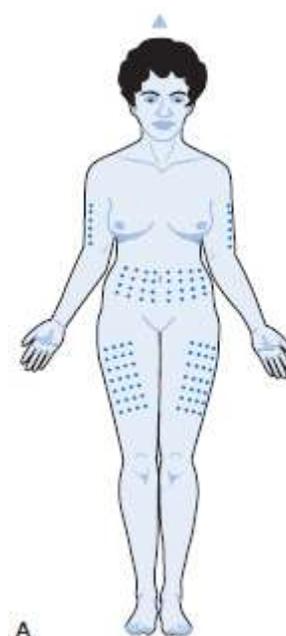
(Some analogues, such as insulins lispro and aspart, are also short-acting, with a faster onset and shorter duration of action than soluble insulin (Short acting) and are sometimes known as **rapid-acting insulins**)<sup>(3)</sup>.

Type of insulin	Appearance	Route(S)
<b>Rapid-acting insulin</b> Insulin Lispro, Insulin aspart, and insulin glulisine	Clear صافي	S.C, I.V
<b>Short-acting insulin</b> (soluble, regular ,neutral)	Clear	S.C, I.V, and I.M
<b>Intermediate-acting insulin</b> Isophane insulin also called NPH(neutral protamine hagedorn) Lente	Cloudy خابط	S.C only
<b>long-acting insulin</b> Ultralente (insulin zinc susp., protamine zinc susp.) Insulin Glargine Insulin Detemir	Cloudy  Clear Clear	S.C only

4-**Biphasic insulins** are mixtures providing for both **immediate and prolonged action**<sup>(3)</sup>.

5-Insulin is **generally given by subcutaneous injection**; the injection site should be rotated to prevent local side effects<sup>(1,3)</sup>. **Short-acting insulins can also be given by I.V route for urgent treatment**<sup>(1)</sup>.

6-The primary sites used for injecting insulin are the **lateral thigh, abdomen and upper arm** . Many practitioners recommend using the abdominal area because absorption from this site is least affected by exercise and is the most predictable<sup>(2)</sup>.



7- **Stability and Storage ( see the product's leaflet also)**

**A-Insulin is a fragile molecule that can be damaged by temperature extremes. All commercially available insulins are stable for at least 28 days (e.g., ~1 month) at room temperature (20°–30°C)**<sup>(2)</sup>.

**B-In practice, most patients store vials currently in use at room temperature because injection of cold insulin is uncomfortable**<sup>(2)</sup>.

**C-All unopened, extra vials or pen devices should be stored in the refrigerator (2°–8°C)**<sup>(2)</sup>.

**D-Insulin should not be used if it has been frozen or exposed to temperatures >37°C**<sup>(2)</sup>.

**E- Insulin preparations should be protected from light**<sup>(3)</sup>.

8-Adminstarion of insulin S.C with a syringe (called **insulin syringe**) is still the most common method of insulin administration.

9- **Insulin pen devices** are also available for injecting insulin. Pen devices are often preferred as they make insulin administration much easier, especially for patients who need to take their insulin doses away from home <sup>(2)</sup>.



10-The **dose of insulin is expressed as units.**

Insulin preparations (if available)			
	Scientific name	Trade names	Dosage form
1	<b>Insulin lispro</b>	Humalog <sup>(Lilly)</sup>	100 I.U /mL    3mL
2	<b>Insulin detemir</b>	Levemir <sup>(Novo Nordisk)</sup>	100 I.U /mL    3mL
3	<b>Protamine zinc insulin</b>	Hypurin Bovine Protamine Zinc <sup>(wackhardt)</sup>	100 I.U /mL    10mL
4	<b>Bisphasic insulin aspart</b>	NovoMix 30 <sup>(Novo-Nordisk)</sup>	30% insulin aspart 70% insulin aspart prot.

Any extra notes:

## 6.2-Thyroid and antithyroid drugs

### 6.2.1-Thyroid hormone

1-Thyroid hormone (**thyroxine(levothyroxine)**) is used in **hypothyroidism** <sup>(1)</sup>. (Hypothyroidism is readily **treated** by lifelong replacement therapy with thyroxine) <sup>(3)</sup>.

2-Absorption is optimal **on an empty stomach, at least 60 minutes before meals** <sup>(2)</sup>. Its best taken on an empty stomach, usually **before breakfast** <sup>(3)</sup>.

**30 minutes before eating breakfast** <sup>(4)</sup> وبعض المصادر تقبل بأخذه

	Scientific name	Trade names	Dosage form
1	<b>levothyroxine</b>	<b>Levoxyl</b>	Tab.25 , 50 , 100 mcg Syrup 25mcg /5mL

Any extra notes:

### 6.2.2-Antithyroid drugs

1-Antithyroid drugs are used **for hyperthyroidism either to prepare patients for thyroidectomy or for long-term management. In Iraq carbimazole is the most commonly used drug** <sup>(1)</sup>.

2-**Rashes and pruritus** are common side effects of carbimazole but they can be **treated with antihistamines without discontinuing therapy** <sup>(1)</sup>

3- **Carbimazole induced-agranulocytosis** <sup>(3)</sup>:

A-Rarely, agranulocytosis can develop, and is the most **serious adverse reaction associated with this class of drugs.**

B-Patients or their carers should be told how to recognize such toxicity and should be advised to seek immediate medical attention if **mouth ulcers** or sore throat, fever, bruising, malaise, or nonspecific illness develop.

C-Full blood counts should be performed, and treatment **should be stopped immediately if there is any clinical or laboratory evidence of neutropenia.**

4-**Propranolol ( $\beta$ -blocker)** is useful for **rapid relief of thyrotoxic symptoms** (e.g. tachycardia) and may be used in conjunction with antithyroid drugs <sup>(1)</sup>.

Scientific name	Trade names	Dosage form
Carbimazole	Neo-Mercazole® <sup>(Amdipharm)</sup>	5mg , 20 mg tablet

Any extra notes:

### 6.3-Corticosteroids

1-The corticosteroids are used in physiological doses for replacement therapy in adrenal insufficiency. **Pharmacological doses are used when anti-inflammatory or immunosuppressant effects are required** <sup>(3)</sup> (for so many different diseases).

2-**The effects of different corticosteroids vary qualitatively as well as quantitatively**, and it may not be possible to substitute one for another in equal therapeutic amounts. Thus, whereas cortisone and hydrocortisone have very

appreciable mineralocorticoid (or sodium-retaining) properties relative to their glucocorticoid (or anti-inflammatory) properties, prednisolone have considerably less, and others, such as betamethasone and dexamethasone, have none or virtually none <sup>(3)</sup>.

3- As a rough guide, the approximate **equivalent doses** of the main corticosteroids in terms of their glucocorticoid (or anti-inflammatory) properties alone, are:

**Betamethasone 0.75 Mg = Cortisone Acetate 25 Mg = Dexamethasone 0.75 Mg = Hydrocortisone 20 Mg = Methylprednisolone 4 Mg = Prednisolone 5 Mg = Prednisone 5 Mg = Triamcinolone 4 Mg <sup>(3)</sup>.**

**4- Important:**

**A-**The use of pharmacological doses of corticosteroids suppresses **the endogenous secretion of steroids by the anterior pituitary** <sup>(3)</sup>.

**B-**The **adrenal suppression is less** when the corticosteroid is given as a **single dose in the morning, and even less if this morning dose is given on alternate days** or less frequently <sup>(3)</sup>.

**C-****Sudden withdrawal** or reduction in dosage, may **precipitate acute adrenocortical insufficiency** <sup>(3)</sup>.

**D-****Gradual withdrawal of systemic corticosteroids is required** for :  
 -Patient who received more than 40 mg prednisolone (or equivalent) daily for more than 1 week <sup>(1)</sup>.  
 -Patient who received more than 3 weeks' treatment <sup>(1)</sup>.

5- Corticosteroids **have numerous side effects including nearly all body systems.**

6- **Important:** Corticosteroids (**especially dexamethasone**) are frequently **abused in Iraq.** (Prolonged use glucocorticoids have a dramatic effect on body fat distribution, resulting in the characteristic **appearance of moon face**) <sup>(3)</sup>.

<b>Corticosteroids</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Betamethasone</b>	<b>Celestone</b> <b>Betnesol</b> <small>(UCB Pharma)</small>	Amp.4mg/mL Tab.0.5mg
<b>2</b>	<b>Dexamethasone</b>	<b><u>Decadron</u></b>	Tab. 0.5 , 2 . Amp.4mg/mL , syrup 2mg/5mL

3	<b>Hydrocortisone</b>	Efcortisol <sup>(Sovereign)</sup>	Amp. Or vial 100mg/mL
4	<b>Methylprednisolone</b>	<b>Medrol</b> Medrone <sup>(Pfizer)</sup>	Tab. 2, 4, 16 Vial 40 , 80 ,125, 500
5	<b>Prednisolone</b>	<b>Orapred</b> <b>Pediapred</b>	Tab. 1, 5, 25 .
6	<b>Triamcinolone</b>	<b>Kenalog</b> <sup>(squibb)</sup>	40mg /mL

**Any extra notes:**

## 6. 4 Sex hormones

### 6.4.1-Female sex hormones

#### 6.4.1.1-Hormone replacement therapy (HRT)

1-Hormone replacement therapy (HRT) with small doses of an oestrogen (together with a progestogen in women with a uterus) **is appropriate for alleviating menopausal symptoms such as vaginal atrophy or vasomotor instability** <sup>(1)</sup>.

(In women with an intact uterus, the addition of a progestogen reduces the additional risk of endometrial cancer) <sup>(1)</sup>.

**Note: Vasomotor symptoms include hot flashes, night sweats.** The hot flash is a sensation of heat that typically begins in the face and chest and quickly spreads.

2-Menopausal **atrophic vaginitis may respond to a short course of a topical vaginal oestrogen** (chapter 7) preparation used for a few weeks and repeated if necessary <sup>(1)</sup>.

<b>HRT</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Conjugated oestrogens</b>	<b>Premarin®</b> <small>(Pfizer)</small>	<b>Tablets</b> <b>(300 mcg, 625 mcg, and 1.25 mg)</b>
2	<b>Estradiol valerate</b>	<b>Pyognova</b> <sup>(Bayer)</sup>	

**Any extra notes:**

### 6.4.1.2-Progestogens

1-Progestogens and drugs with progestogenic actions (e.g. dydrogesterone and medroxyprogesterone and norethisterone may be used in **menstrual disorders such as dysmenorrhoea and menorrhagia** associated with dysfunctional uterine bleeding <sup>(1,3)</sup>.

2-Progestogens may also be used in the **management of endometriosis** <sup>(3)</sup>.

3- Progestogens may be used as contraceptive . Progestogens sometimes are used with oestrogens for **HRT** (see above) <sup>(3)</sup>.

4- **Important** : Progestogens have been used for the **prevention of spontaneous abortion** in women with a history of recurrent miscarriage (habitual abortion) **but there is no evidence of benefit and they are not recommended for this purpose** <sup>(3)</sup>.

وهذا الاستعمال يطلق عليه محليا تسمية مثبت وكما تلاحظ فانه لا يتوفر أي دليل علمي يؤيد هذا الاستعمال

<b>Progestogens</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Dydrogesterone</b>	<b>Duphaston</b> <sup>®(Bayer)</sup>	<b>10 mg tablet</b>
<b>2</b>	<b>Medroxyprogesterone</b>	<b>Provera</b> <sup>®(Pharmacia)</sup>	<b>5 mg and 10 mg tablet</b>
<b>3</b>	<b>Norethisterone</b>	<b>Primolut-N</b> <sup>®(Bayer)</sup>	<b>5mg tablet</b>
<b>4</b>	<b>Lynestrenolum</b>	<b>Orgametril</b> <sup>(organom)</sup>	<b>Tab.5mg</b>

**Any extra notes:**

### 6.4.2- Male sex hormones

1-The primary indication for androgens, such as testosterone or its esters, is as replacement therapy in male hypogonadal disorders caused by either pituitary or testicular disorders <sup>(3)</sup>.

2-Androgens are useless as a treatment of impotence and impaired spermatogenesis unless there is associated hypogonadism <sup>(1)</sup>.

3- The **testosterone esters** are usually formulated as oily solutions for **intramuscular** use to give a prolonged duration of action <sup>(3)</sup>.

Male sex hormones			
	Scientific name	Trade names	Dosage form
1	Mesterolone	Pro-Viron® <sup>(Bayer)</sup>	25 mg tablet
2	Testosterone	Sustanon® <sup>(MSD)</sup>	Injection amp. 30 ,60

**Any extra notes:**

### 6.4.3 Anti-androgens

1-**Cyproterone** acetate is an anti-androgen. It is used for the **control of libido** in severe hypersexuality or sexual deviation in men. Cyproterone acetate may be used with ethinylestradiol in women for the control of **acne** and **hirsutism** <sup>(3)</sup>. It is given after food <sup>(1)</sup>.

2-**Fatigue and lassitude** may be produced by the drug which may impair performance of skilled tasks (e.g. driving) <sup>(1)</sup>.

Scientific name	Trade names	Dosage form
<b>Cyproterone</b>	<b>Androcur®</b>	<b>Tablets 50 mg</b>
Cyproterone 2mg +Ethinyl estradiol 0.03	<b>Diane 35</b> <sup>(Bayer)</sup>	<b>Tab.</b>

**Any extra notes:**

### 6.4.4-Anabolic steroids

1-**Nandrolone** is an anabolic steroid with some androgenic. It is usually given in the form of oily **intramuscular injections** as an **anabolic after debilitating illness** <sup>(3)</sup>.

2-**Important:** The protein-building properties of anabolic steroids have not proved beneficial in the clinical setting. Their use as body builders or tonics is unjustified; **some athletes abuse them** <sup>(1)</sup>.

3-Anabolic steroids have been given for osteoporosis in women but **they are no longer advocated for this purpose** <sup>(1)</sup>.

	Scientific name	Trade names	Dosage form
<b>1</b>	<b>Nandrolone</b>	<b>Deca-Durabolin®</b> (MSD)	<b>Injection</b>

**Any extra notes:**

## **6.5 Hypothalamic and anterior pituitary hormones and antioestrogens**

### **6.5.1-Anti-oestrogens**

#### **1- Clomifene (clomiphene) :**

A-Clomifene is the most widely used drug in the treatment of **female with anovulatory infertility** <sup>(1, 3)</sup>.

B-The usual oral dose is 50 mg of clomifene citrate daily **for 5 days starting within about 5 days of onset of menstruation (preferably on 2nd day)**. If ovulation does not occur, a course of 100 mg daily for 5 days may be given <sup>(1, 3)</sup>.

C-Patients should be warned that there is **a risk of multiple pregnancy** (rarely more than twins) <sup>(1)</sup>.

#### **2- Tamoxifen <sup>(3)</sup> :**

A-Tamoxifen is an oestrogen antagonist with actions similar to those of clomifene citrate.

B- It is used in the **treatment of breast cancer**.

C- Tamoxifen is also used to stimulate **ovulation in women with anovulatory infertility**.

<b>Anti-oestrogens</b>			
	Scientific name	Trade names	Dosage form
<b>1</b>	<b>clomifene</b>	<b>Clomid®</b> (Sanofi Aventis)	<b>50 mg Tablet</b>
<b>2</b>	<b>Tamoxifen</b>	<b>Tamoxifen</b>	<b>10 mg and 20 mg Tablets</b>

**Any extra notes:**

## 6.5.2-Gonadotrophins

1-Follicle-stimulating hormone (FSH) and luteinizing hormone (LH) together , follicle-stimulating hormone alone, or chorionic gonadotrophin, are used in the treatment of infertility in women with proven hypopituitarism or who have not responded to clomifene <sup>(1)</sup>.

Gonadotrophins			
	Scientific name	Trade names	Dosage form
1	Human Chorionic Gonadotrophin; HCG	Pregnyl® (MSD)	1500-unit and 5000-unit ampules.
2	Follitropin Alfa (Recombinant human FSH)	Gonal-F® (Merck Serona )	75-unit ampule.
3			

**Any extra notes:**

## 6.6-Posterior pituitary hormones

1-Vasopressin (antidiuretic hormone, ADH) is used in the treatment of pituitary ('cranial') **diabetes insipidus** as is its analogue desmopressin <sup>(1)</sup>.

2-**Desmopressin** is more **potent and has a longer duration of action than vasopressin**; unlike vasopressin it has no vasoconstrictor effect (It is given by mouth or **intranasally** for maintenance therapy) <sup>(1)</sup>.

3- Patients being treated for primary nocturnal enuresis should be warned to **limit fluid intake to minimum from 1 hour before dose until 8 hours afterwards**; and to stop taking desmopressin during an episode of vomiting or diarrhea (until fluid balance normal) <sup>(1)</sup>.

4-**Other uses:**

A-Desmopressin is also used to boost factor VIII concentration in mild to moderate haemophilia and in von Willebrand's disease <sup>(1)</sup>.

B- Terlipressin, a derivative of vasopressin, is used to control variceal bleeding in portal hypertension in patient with liver cirrhosis <sup>(1)</sup>.

Scientific name	Trade names	Dosage form
Desmopressin	Minirin® (ferring )	Nasal spray

**Any extra notes:**

## 6.7-Bisphosphonates

1- Bisphosphonates (either oral e.g. : Alendronate, ibandronate and risedronate or I.V e.g. zoledronic acid) **inhibit bone resorption** <sup>(1, 3)</sup>.

2- **Osteoporosis** associated with excessive bone resorption and turnover and occurs most commonly in **postmenopausal women and in those taking long-term oral corticosteroids** <sup>(1, 3)</sup>.

### 3-Uses of Bisphosphonates:

A-Bisphosphonates have an important role in the **prophylaxis and treatment of osteoporosis** (e.g. postmenopausal osteoporosis ) and corticosteroid-induced osteoporosis <sup>(1)</sup>.

B-Because bone resorption increases plasma-calcium concentrations, the **bisphosphonates are used as adjuncts to the treatment of severe hypercalcaemia, especially when associated with malignancy** <sup>(3)</sup>.

C-They are also used in other disorders associated with excessive bone resorption and turnover, such as **Paget's disease of bone**, as well as in the management of bone Metastases <sup>(3)</sup>.

4-Some bisphosphonate preparation may be given **once daily** (e.g. 10 mg alendronate tablet), **once weekly** (e.g. 70 mg alendronate tablet, risedronate 35 mg tablet), as well as **once monthly** (ibandronic acid 150 mg tablet) <sup>(1)</sup>.

### 5- Important :Administration <sup>(5)</sup>:

A-Because bioavailability is very poor for bisphosphonates and to minimize GI side effects, **each oral dose should be taken with at least 6 ounces of plain tap water** (not coffee, juice, mineral water, or milk) at

least 30 (60 for ibandronate) **minutes before consuming any food**, supplements (including calcium and vitamin D), or medications.

**B-The patient should also remain upright** (i.e., either sitting or standing) for at least 30 minutes after alendronate and risedronate and 1 hour after ibandronate administration.

C-A patient who misses a weekly dose can take it the next day. If more than 1 day has lapsed, that dose is skipped until the next scheduled ingestion. If a patient misses a monthly dose, it can be taken up to 7 days before the next administration.

**6- Oesophageal reactions:** Severe oesophageal reactions reported with all oral bisphosphonates; patients should be advised to stop tablets and seek medical attention for symptoms of oesophageal irritation such as dysphagia, pain on swallowing, retrosternal pain, or heartburn <sup>(1)</sup>.

<b>Bisphosphonates</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Aldendronic acid</b>	<b>Fosamax</b> <sup>(MSD)</sup>	Tab. 10mg
<b>2</b>	<b>Disodium pamidronate</b>	<b>Aredia</b> <sup>(Novartis)</sup>	Vial 15mg ( infusion)

<b>Any extra notes:</b>		
<b>Disodium etidronate</b>	<b>Didronel</b>	<b>tab. 200mg</b>

## **6.8-Other endocrine drugs**

### **6.8.1-Bromocriptine and other dopaminergic drugs**

1-Bromocriptine is a stimulant of dopamine receptors in the brain; it also inhibits release of prolactin by the pituitary. **Cabergoline** has actions and uses similar to those of bromocriptine, **but its duration of action is longer** <sup>(1)</sup>(it is usually given once weekly).

#### **2-Uses:**

A-Bromocriptine, inhibits the secretion of prolactin from the anterior pituitary and *is* used in the treatment of **prolactinoma** (prolactin-secreting pituitary adenomas) and endocrinological disorders associated with

hyperprolactinaemia, including **amenorrhoea, galactorrhoea, and infertility in both men and women** <sup>(3)</sup>.

B- Growth hormone secretion may be suppressed by bromocriptine in some patients with **acromegaly** <sup>(3)</sup>.

C-Because of its dopaminergic activity bromocriptine is also used **in the management of Parkinson's disease** <sup>(3)</sup>.

### 3-Adverse Effects <sup>(3)</sup>:

A-**Nausea is the most common adverse effect** at the beginning of treatment with bromocriptine, but vomiting, dizziness, and orthostatic hypotension may also occur. Syncope has followed initial doses.

B-Adverse effects are generally dose-related and may therefore be more frequent with the higher doses

C-Nausea may be reduced by **gradual increase of the dose**, taking bromocriptine **with food; domperidone** (chapter 1) may also be given **at least 1 hour before bromocriptine**, for the first few days of therapy.

4-**Important** : concerning **cabergoline**: the BNF stated that it should be dispense in original container (contains desiccant) <sup>(1)</sup>.

(A desiccant is a hygroscopic substance that induces or sustains a state of dryness (desiccation) in its vicinity)

إن الدواء غالبي نوعا ما وأحيانا يضطر المريض إلى شراء الدواء مفردا (أي حبة أو أكثر) مما يضطر الصيدلي إلى إخراج الدواء من العبوة الأصلية ووضعه في كيس من الورق أو النايلون وهو ما لا يسمح به المصدر أعلاه

<b>Bromocriptine and other dopaminergic drugs</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Bromocriptine</b>	<b>Parodel®</b> <sup>(Meda)</sup>	<b>2.5 mg tablet</b>
<b>2</b>	<b>Cabergoline</b>	<b>Dostinex ®</b> <sup>(pharmacia)</sup>	<b>0.5 mg tablet</b>

**Any extra notes:**

## 6.8.2-Drugs affecting gonadotrophins

### 6.8.2.1-Danazol

1-Danazol inhibits pituitary gonadotrophins (follicle stimulating hormone and

luteinising hormone); it combines androgenic activity with antioestrogenic and antiprogestogenic activity. **It is used mainly for the treatment of endometriosis** <sup>(1)</sup>.

(Endometriosis is a condition affecting women mainly in their reproductive years, and caused by endometrial tissue developing outside the uterine cavity) <sup>(1)</sup>.

Scientific name	Trade names	Dosage form
<b>Danazol</b>	<b>Danol®</b> <small>(Sanofi Aventis)</small>	Capsules, danazol 100 mg and 200 mg

**Any extra notes:**

### 6.8.2.2-Gonadorelin analogues

1-Administration of gonadorelin analogues [buserelin, goserelin, leuprorelin, nafarelin, and triptorelin(which are more potent and have a longer duration of action)] produces an initial phase of stimulation; continued administration is followed by down-regulation of gonadotrophin-releasing hormone receptors, thereby reducing the release of gonadotrophins (follicle stimulating hormone and luteinising hormone) which in turn leads to inhibition of androgen and oestrogen production <sup>(1, 3)</sup>.

2-Gonadorelin analogues are used in the treatment of **endometriosis**, and **prostate cancer** <sup>(1)</sup>.

3-Other uses include the treatment of precocious puberty, infertility, anaemia due to uterine fibroids (together with iron), breast cancer, and before intra-uterine surgery. Use of leuprorelin and triptorelin for 3 to 4 months before surgery reduces the uterine volume, fibroid size and associated bleeding <sup>(1)</sup>.

<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>Goserelin</b>	<b>Zoladex®</b>	Goserelin acetate is available as depot preparations (3.6 mg and 10.8 mg); injected subcutaneously into the anterior abdominal wall.(3.6 mg is given every 28 days ) (10.8 mg is given every 12 weeks) <sup>(1)</sup> .

**Any extra notes:**

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## Chapter Seven: for Obstetrics, gynaecology, and urinary-tract disorders

### 7.1 Drugs used in obstetrics

#### 7.1.1-Tocolytics

1-Tocolytics **inhibit uterine contractions** and are used **in premature labour to delay early delivery** <sup>(1)</sup>.

2-**β<sub>2</sub>- agonists** (like salbutamol)(chapter 3) and **calcium-channel blockers** ( Nifedipine)(chapter 2) have used for their tocolytic actions <sup>(1)</sup>.

#### 7.1.2-Induction and augmentation of labour

1-**Oxytocin** is administered by slow intravenous infusion, using an infusion pump, to induce or augment labour <sup>(2)</sup>.

2-**Misoprostol** is given orally or vaginally for the **induction of labour** <sup>(2)</sup> (and the **termination** of pregnancies) <sup>(1)</sup>.

Drugs for Induction and augmentation of labour			
	Scientific name	Trade names	Dosage form
1	<b>Oxytocin</b>	<b>Pitocin ®</b>	<b>Injection</b>
2	<b>Misoprostol</b>	<b>Cytotec ®</b>	<b>200 mcg tablet</b>

**Any extra notes:**

#### 7.1.3-Prevention and treatment of haemorrhage

1-If the uterus fails to contract adequately after delivery (**uterine atony**), or if retained placental remnants prevent retraction of the placental bed, postpartum haemorrhage may occur. These two causes account for about 80% of cases of postpartum haemorrhage <sup>(1)</sup>.

2-Postpartum haemorrhage **may be fatal** to the mother unless promptly dealt with, and management generally involves:

- removal of the placenta if it has not been expelled.
- the use of **oxytocics to contract the uterus**.
- transfusion if blood loss is severe.

3-Parenteral oxytocin, or an ergot alkaloid (**ergometrine or methylergometrine**), is the oxytocic generally used to control bleeding due to uterine atony <sup>(1)</sup>.

Scientific name	Trade names	Dosage form
<b>Methylergometrine</b>	<b>Metherin</b>	Tab. 0.125 , Amp. 0.5mg/ mL

**Any extra notes:**

## 7.2-Preparations for vaginal and vulval conditions

### 7.2.1-Topical Hormone replacement therapy (HRT) for vaginal atrophy

A cream containing an **oestrogen** may be applied on a short-term basis to improve the vaginal epithelium in menopausal atrophic vaginitis <sup>(2)</sup>.

Scientific name	Trade names(if available)	Dosage form
<b>Estriol 0.1%</b>	<b>Ovestin (MSD)</b>	

**Any extra notes:**

### 7.2.2-Vaginal Fungal infections

#### 1-Guideline for applying vaginal products<sup>(3)</sup>:

- 1-Start treatment at night before going to bed. Lying down will reduce leakage of the product from the vagina.
- 2-Wash the entire vaginal area with mild soap and water, and dry completely before applying the product.
- 3-**Vaginal cream:** (If prefilled applicators are being used, skip to step 4.) Unscrew the cap; place the cap upside down on the end of the tube. Push down firmly until the seal is broken. Attach the applicator to the tube by turning the applicator clockwise. Squeeze the tube from the bottom to force the cream into the applicator. Squeeze until the inside piece of the applicator is pushed out as far as possible and the applicator is completely filled with cream. Remove the applicator from the tube.

**Vaginal tablets/suppositories:** Remove the wrapper and place the product into the end of the applicator barrel.



4-While standing with your feet slightly apart and your knees bent, as shown in drawing A, or while lying on your back with your knees bent, as shown in drawing B, gently insert the applicator into the vagina as far as it will go comfortably.

5-Push the inside piece of the applicator in and place the cream as far back in the vagina as possible. To deposit vaginal tablets/suppositories, insert the applicator into the vagina and press the plunger until it stops.

6-Remove the applicator from the vagina.

7-After use, recap the tube (if using cream). Then clean the applicator by pulling the two pieces apart and washing them with soap and warm water.

8-If desired, wear a sanitary pad to absorb leakage of the vaginal antifungal. Do not use a tampon to absorb leakage.

9-Continue using the product for the length of time specified in the product instructions. Use the product every day without skipping any days, even during menstrual flow.



2-**Vaginal candidiasis** is treated primarily with antifungal pessaries or cream inserted high into the vagina (including during menstruation) <sup>(2)</sup>.

3-**Single-dose preparations** offer an advantage **when compliance is a problem** <sup>(2)</sup>.

4-**Imidazole drugs** (clotrimazole, econazole, and miconazole) are effective against candida in short courses of 1 to 14 days according to the preparation used; treatment can be repeated if initial course fails to control symptoms or if symptoms recur <sup>(2)</sup>.

5- All **internal preparations** should be administered **at night** (this give the drug time to be absorbed, and eliminate the possibility of accidental loss which is more likely to occur if the person is mobile) <sup>(4)</sup>.

6-**Oral** treatment of vaginal infection (e.g. with **fluconazole**) is also effective <sup>(2)</sup>.

Antifungals for Vaginal Fungal infections				
	Scientific name	Trade names	Dosage form	Treatment course
1	<b>Nystatin</b>	<b>Mycostatin</b>	Vag.tab. ,cream .	Insert 1 tablet or cream intravaginally at bedtime for 14 consecutive days .
2	<b>Clotrimazole</b>	<b>Canestan</b> (Bayer)	Cream1% ,2% , pessary100 , 200	Administer 1 applicatorful intravaginally at bedtime for7 consecutive days with 1% or 100 , but 2% or 200 for 3 day .
3	<b>Miconazole</b>	<b>Gyno Daktarin</b> (Janssen) <b>Daktarin</b> (Janssen)	Cream ,vig.cap.	Administer 1 applicatorful intravaginally at bedtime for7 consecutive days with 2% or 100 , but 4% or 200 for 3 day . 1200 for 1day .

4	<b>Econazole</b>	<b>Gyno Pevaryl</b> <sup>(Janssen)</sup>	Cream , pessary	Administer 1 applicatorful intravaginally at bedtime for 7 consecutive days with 1% or 100 .
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Any extra notes:

## 7.3-Contraceptives

**Note :** there are many contraception methods including:

**A-Hormonal contraception B-Intra-uterine devices (IUD) C-Barrier methods (like condoms) D- Spermicide.**

### 7.3.1-Hormonal contraception

#### 7.3.1.1-Combined oral contraceptives (COCs)

1-COCs are a combination of **estrogen** (prevent the development of the dominant follicle) and **progestin** (prevent ovulation) <sup>(5)</sup>.

2-The COCs are available in a variety of cycle lengths. **The most common is the 28-day pack that contains 21 days of active pills** (pills that contain estrogen and progestin) **followed by 7 days of placebo pills** (to minimize confusion) the patient takes one pill daily. After taking the last pill of a 28-day pack, the patient should begin a new pack the next day <sup>(5)</sup>.



إن تناول المرأة لحبوب منع الحمل يوميا لمدة 28 يوم (21 حبة تحتوي الدواء و 7 حبات بلاسيبو (تحتوي على الحديد عادة)  
(الحبوب الغامقة في الشريط المجاور) يكون أسهل وأقل احتمالا لحدوث الالتباس من تناول المرأة لـ 21 حبة ثم التوقف لمدة أسبوع ومن ثم استئناف تناول الحبوب ثانية.

4- COCs have benefits aside from pregnancy prevention that include treatment of **acne, hirsutism, premenstrual syndrome (PMS), menstrual cycle regulation...** <sup>(5)</sup>.

### 7.3.1.2-Progestogen-only contraceptives

#### 7.3.1.2.1- Oral progestogen-only contraceptives

**Advantages**

1-Oral progestogen-only preparations may offer a suitable alternative **when oestrogens are contra-indicated** (including those patients with venous thrombosis or a past history of venous thrombosis)<sup>(2)</sup>.

2- **Confusion with pill taking is minimized because there is no placebo week** and all 28 pills in each pack are the same<sup>(5)</sup>.

### Disadvantages

1-**Important:** They must be taken even **more regularly than COCs**, they are taken as One tablet daily, on a continuous basis, starting on day 1 of cycle and taken at the same time each day (**if delayed by longer than 3 hours contraceptive protection may be lost**)<sup>(3, 5)</sup>.

2- They may have a **higher failure rate than combined preparations**<sup>(1)</sup> (0.3% - 8%)<sup>(5)</sup>.

### Note (important )use of oral contraceptives during breast-feeding

1-The American College Of Gynecology (ACOG) recommends **waiting at least 6weeks before starting any estrogen-containing contraceptive** regardless of breast-feeding status (By this time, the increased risk of thrombosis that occurs during pregnancy should be reduced to baseline). However, COCs have been reported to decrease milk quantity and quality. Therefore, many providers suggest avoiding COCs in women who are exclusively breastfeeding<sup>(5)</sup>.

2-For non–breast-feeding women, a progestin-only contraceptive may be used **immediately postpartum and 6 weeks postpartum** if solely breast-feeding and in **some cases 3 weeks postpartum** if partially breast-feeding<sup>(5)</sup>.

Oral contraceptives: COCs and progestin-only contraceptive			
	Scientific name	Trade names	Dosage form
1	Ethinylestradiol 0.03 , Levonorgestrel 0.15	Microgynon® (Bayer)	Tab. Or pill
2	Ethinylestradiol 0.03 Drospirenone 0.3	Yasmin (Bayer)	Pill

Any extra notes:



ملاحظة : إن فعالية حبوب منع الحمل قد تتأثر بكثير من الحالات ولكل حالة توصية خاصة بها يذكرها كتاب BNF وليس هذا محل ذكرها ومن هذه الحالات :

1- Missed pill    2- Diarrhea and vomiting    3- Interactions with other drugs.

### 7.3.1.2.2-Parenteral progestogen-only contraceptives

1-Injectable Medroxyprogesterone acetate is given as a 150-mg intramuscular injection<sup>(5)</sup> repeated every 12 weeks<sup>(2)</sup>.

	Scientific name	Trade names	Dosage form
1	Medroxyprogesterone acetate	Depo-Provera® (Pfizer)	150 mg injection

### 7.3.2-Spermicidal contraceptives (nonoxinol '9')

1- Vaginal spermicides (a chemical that kills sperm such as nonoxinol 9) may be used as foam, creams, gels or pessaries - dissolvable tablets, inserted into the vagina.

2-The vaginal **pessaries - dissolvable tablets** required about 15 minute to produce its effect (onset of action) and has a duration of action of about 1 hour<sup>(5)</sup>.

Spermicidal contraceptives (if available)			
	Scientific name	Trade names	Dosage form
1	Nonoxinol 9	Gygel (Marlborough)	Supp. Gel 2%

## 7.4-Drugs for genito-urinary disorders

### 7.4.1-Drugs for benign prostatic hyperplasia (BPH):

1- The **alpha1-selective alpha blockers**(like: alfuzosin, doxazosin, tamsulosin and terazosin) relax smooth muscle in BPH producing an increase in urinary flow-rate and an improvement in obstructive symptoms<sup>(2)</sup>.

2-The **5 $\alpha$ -reductase inhibitors** (finasteride and dutasteride)(decreases the conversion of testosterone to the more active form)( reduce prostate volume, although this takes a number of months )<sup>(1)</sup>.

**So :  $\alpha$ 1-blokers can produce rapid symptomatic relief only (not affect the prostate volume) while 5 $\alpha$ -reductase inhibitors reduce prostate volume but this effect is delayed. Therefore both drugs may be used together.**

3- **Tamsulosin**, may be used also for expulsion of **lower ureteral stones** (for both male and female)<sup>(1)</sup>.

4-  $\alpha$ 1-blokera can cause **orthostatic hypotension** which may be severe and produce syncope after the initial dose. This reaction can be avoided by starting treatment with a **low dose, preferably at night** <sup>(1)</sup>. Patient should be warned to lie down if symptoms such as dizziness, fatigue or sweating develop, and to remain lying down until they abate completely <sup>(2)</sup>.

**Note : Tamsulosin** is selective for prostatic  $\alpha$ 1Areceptors. Therefore, **it unlikely to cause orthostatic hypotension.**

5-**Important:** Finasteride could produce **feminisation of a male fetus if used in pregnant women**; therefore, it recommended that women who are or may become pregnant **should not handle crushed or broken finasteride tablets**. Finasteride has been detected in semen, therefore use of a condom is recommended if the patient's sexual partner is, or may become, pregnant <sup>(2)</sup>.

6- In the **treatment alopecia in men, finasteride** is given orally **in a low dose** (1 mg daily) while the dose used for BPH is 5 mg daily.

<b>5<math>\alpha</math>-reductase inhibitors</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Finasteride</b>	<b>Prostacare</b> <b>Proscar</b> <sup>(MSD)</sup>	Tab.5 .

<b><math>\alpha</math>1-blokera</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Alfuzosin</b>	<b>Xatral</b> <sup>(Sanofi Aventis)</sup>	Tab. 2.5 .
<b>2</b>	<b>Doxazosin</b>	<b>Cardura</b> <sup>(Pfizer)</sup>	Tab. 1 ,2 .
<b>3</b>	<b>Tamsulosin</b>	<b>Tadin</b> or <b>Omnice</b> <b>Combodart</b>	M.R cap 0.4 M.R tab. 0.4
<b>4</b>	<b>Terazosin</b>	<b>Hytrin</b> <sup>(Amdipharm)</sup>	

**Any extra notes:**

## 7.4.2-Drugs for urinary frequency, enuresis, and incontinence.

### 7.4.2.1-Urinary incontinence (UI)

**Note :** UI occurs as a result of overfunctioning or underfunctioning of the urethra, bladder, or both . **Urethral underactivity** is known as **stress UI**.

**Bladder overactivity** is known **as Urge UI** (bladder muscle is overactive and contracts inappropriately).

1- The antimuscarinic **oxybutynin** also has direct smooth muscle relaxant properties and has been most widely used for **Urge UI** , but adverse effects are common. **Tricyclic antidepressants** have also been used in urge incontinence because of their antimuscarinic activity <sup>(1)</sup>.

2-**Stress incontinence is generally managed by non-drug methods** (specific type of exercise) . **Duloxetine** (chapter 4) can be added and is licensed for the treatment of moderate to severe stress incontinence in women <sup>(2)</sup>.

Scientific name	Trade names	Dosage form
<b>Oxybutynin</b>	<b>Ditropan</b> <small>(Sanofi Aventis )</small>	Tab. 2.5 , 5 . syrup 5mg / 5mL

**Any extra notes:**

### 7.4.2.2-Nocturnal enuresis

1-**Treatment is not appropriate in children under 5 years** and it is usually not needed in those aged under 7 years and in cases where the child and parents are not anxious about the bedwetting; however, **children over 10 years usually require prompt treatment** <sup>(2)</sup>.

2-An **enuresis alarm should be first-line treatment** for well-motivated, well-supported children aged over 7 years because alarms have a lower relapse rate than drug treatment when discontinued <sup>(2)</sup>.

**Note:** The alarm sounds when the first drop of urine contacts the probe.

3-Drug therapy is not usually appropriate for children under 7 years of age; it can be used when alternative measures have failed, preferably on a short-term basis, for example to cover periods away from home, or if the child and family are anxious about the condition <sup>(2)</sup>.

4-**Desmopressin** (chapter 6), an analogue of vasopressin, is used for nocturnal enuresis; it is given **by oral or by sublingual administration**. Particular care is

needed to **avoid fluid overload**. Treatment should not be continued for longer than 3 months without interrupting treatment for 1 week for full re-assessment<sup>(2)</sup>.

**5-Important : Desmopressin should not be given intranasally for nocturnal enuresis due to an increased incidence of side-effects<sup>(2)</sup>.**

ومع الأسف فإن هذا الاستعمال هو الشائع في العراق حالياً

6-Tricyclic antidepressants (see chapter 4 ) such as **imipramine**, are used but relapse is common after withdrawal. Treatment should not normally exceed 3 months unless a full physical examination is made and the child is fully re-assessed<sup>(2)</sup>.

### **7.4.3-Drugs for erectile dysfunction**

1-**Phosphodiesterase type-5 inhibitors**: Sildenafil, tadalafil and vardenafil are licensed for the treatment of erectile dysfunction (ED)<sup>(2)</sup>.

2-They have **no effect on the penis in the absence of sexual stimulation<sup>(1)</sup>**.  
( Adequate sexual stimulation is needed to trigger the events leading to erection)<sup>(5)</sup>.

3- Adverse effects most commonly reported are **related vasodilatation and include Headache and flushing**. Also common are **visual disturbances such as blurred vision<sup>(1)</sup>**.

4-Phosphodiesterase type-5 inhibitors may potentiate the hypotensive effects of nitrates, and are therefore **contra-indicated in patients receiving such drugs<sup>(1)</sup>**.

5-In **erectile dysfunction** the usual dose is equivalent to sildenafil 50 mg about one hour before sexual intercourse. The dose may be increased or decreased depending on response. The maximum recommended dose is 100 mg, and sildenafil should not be taken more than once in 24 hours<sup>(1)</sup>.

6-**Onset of effect of sildenafil** (but not tadalafil or vardenafil ) may be **delayed if taken with food<sup>(2)</sup>**.

7-Important : Sildenafil, and tadalafil are licensed for the treatment of pulmonary arterial hypertension (**for both male and female**)<sup>(2)</sup>.

<b>Phosphodiesterase type-5 inhibitors</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Sildenafil</b>	<b>Viagra</b> <sup>(Pfizer)</sup>	Tab. 25 , 50 , 100 .
<b>2</b>	<b>Tadalafil</b>	<b>Cialis</b> <sup>(Lilly)</sup>	Tab. 2.5 , 5 , 10 , 20 .
<b>3</b>	<b>Vardenafil</b>	<b>Levitra</b> <sup>(Bayer)</sup>	Tab . 5 , 10 , 20 .

Any extra notes:

## 7.5-Other preparations for urinary disorders

### 7.5.1-Alkalinisation of urine

1-The alkalinising action **may relieve the discomfort of cystitis** caused by lower urinary tract infections <sup>(2)</sup>.

2-**Prevention of uric acid stones** is also an indication for alkalinisation of urine <sup>(1)</sup>.

3-**Potassium Citrate and sodium bicarbonate** are used for this purpose.

Drugs for Alkalinisation of urine			
	Scientific name	Trade names	Dosage form
1	<b>Sodium citrate , citric acid , sodium bicarbonate , tartaric acid .</b>	<b>Citrogran®</b>	<b>Granules</b>
2	<b>Potassium , Sodium , Hydrogen , citrate</b>	<b>Uralyt-U®</b> (MADAUS)	<b>Powder</b>
3	<b>Khellin , Cymbogon proximus</b>	<b>Kellagon®</b>	<b>Powder</b>

Any extra notes:

### 7.5.2-Phenazopyridine



A-Phenazopyridine exerts an analgesic effect on the mucosa of the urinary tract and is used to **provide symptomatic relief** of pain and irritability in conditions such as cystitis and prostatitis , and urethritis. It is given **after food** <sup>(1)</sup>. It cause **discoloration** of urine.



**B-Important : If given with an antibacterial for the treatment of urinary-tract infections , treatment should usually not exceed 2 days** <sup>(1)</sup>.

(Urinary analgesics also may *mask signs and symptoms of UTIs* not responding to antimicrobial therapy) <sup>(6)</sup>.

### 7.5.3- Rowatinex®

A-A terpene mixture (Rowatinex®) is claimed to be of benefit in urolithiasis (stone) **for the expulsion of calculi** <sup>(2)</sup>.

B-It is given **before food** <sup>(2)</sup>.

Scientific name	Trade names	Dosage form
terpene mixture	<b>Rowatinex®</b> (Rowa)	<b>Soft gelatin capsule</b>
<b>Phenazopyridine</b>	<b>Urisept®</b>	<b>Tablet</b> 

**Any extra notes:**

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## Chapter Eight: Nutrition and blood

### 8.1-Anaemias and some other blood disorders

#### 8.1.1-Oral iron

1-The oral dose of **elemental iron** for iron-deficiency anaemia should be 100 to 200 mg daily <sup>(1)</sup>.

2- The **iron content of various iron salts** is tabulated in the table <sup>(1)</sup>.

Iron salt	Amount	Content of ferrous iron
Ferrous fumarate	200 mg	65 mg
Ferrous gluconate	300 mg	35 mg
Ferrous sulphate	300 mg	60 mg
Ferrous sulphate, dried	200 mg	65 mg

3- Oral iron **preferably taken on an empty stomach** because food, especially dairy products, decreases the absorption by 40% to 50% <sup>(3)</sup>. (However, many patients must take iron with food because they experience gastrointestinal upset when iron is administered on an empty stomach.) <sup>(4)</sup>

4-The patient should be told that **oral iron therapy produces dark stools** <sup>(3)</sup>.

**5-Oral** iron preparations sometimes produces **gastrointestinal irritation** and abdominal pain with nausea and vomiting. **Adverse effects can be reduced by giving it with or after food** (rather than on an empty stomach) or by beginning therapy with a small dose and increasing gradually <sup>(2)</sup>.

**6-Important: Oral Liquid preparations** containing iron salts should be well **diluted with water and swallowed through a straw to prevent discoloration of the teeth** <sup>(2)</sup>.

7- Iron should be **stored in a safe place, inaccessible to her young children**. Accidental ingestion of even small amounts (three to four tablets) of oral iron can cause serious consequences in small children <sup>(3)</sup>.

8-Preparations containing **iron and folic acid are used during pregnancy** in women who are at high risk of developing iron and folic acid deficiency <sup>(1)</sup>.

<b>Oral iron (including combination products)</b>			
	Scientific name	Trade names	Dosage form
1	<b>Ferrous fumarate 200mg .</b>	<b>Ferrosam®</b>	<b>Tablet</b>
2	<b>Ferrous hydroxide 50mg/5mL .</b>	<b>Ferrosam®</b>	<b>Syrup</b>
3	<b>Vit. B<sub>1</sub>,B<sub>2</sub>,B<sub>6</sub>,B<sub>12</sub>, Nicotinamide , MgCl , Fe Al citrate , Na-glycerophosphate .</b>	<b>Ferro-B®</b>	<b>Syrup</b>

4	<b>dried ferrous sulphate 150 mg (47 mg iron), folic acid 0.5 mg.</b>	<b>Fefol®</b>	<b>Capsule</b>
5	<b>Vit. B<sub>1</sub>,B<sub>2</sub>,B<sub>6</sub>,B<sub>12</sub>, Nicotinamide , Ca – pantothenate</b>	<b>B – Plex</b>	Syrup , cap

**Any extra notes:**

### 8.1.2-Parenteral iron

1-Iron can be administered parenterally . **Iron dextran, and iron sucrose** are currently available in Iraq. Parenteral iron is generally reserved for use **when oral therapy is unsuccessful.**

2-With the exception of patients with severe renal failure receiving haemodialysis, **parenteral iron does not produce a faster haemoglobin response than oral iron**

provided that the oral iron preparation is taken reliably and is absorbed adequately <sup>(1)</sup>.

3-**Anaphylactoid reactions** occur in less than 1% of patients treated with parenteral iron therapy and are more **commonly associated with iron dextran than with iron sucrose** <sup>(3)</sup>.

#### 4- Test dose:

A-It is suggested that all patients considered for iron dextran injection receive a test dose . Patient **should be observed for more than 1 hour** for untoward (chest pain, hypotension ...).if no reaction occurs, the remainder of the dose can be given.

If an anaphylactic – like reaction occurs, it generally responds to i.v epinephrine, diphenhydramine, and corticosteroids <sup>(4)</sup>.

B- A Test dose of 0.2 mL (10 mg) has been suggested for children weighing less than 10 kg, 0.3 mL (15 mg) for those weighing 10 to 20 kg, **and 0.5 mL (25 mg) for adults** <sup>(2)</sup>.

5- In **Iraq, iron dextran is given most commonly by IM route.** In these cases, undiluted drug should be **administered using a Z-track technique to avoid staining the skin.** (The skin should be pulled laterally before injection; then the drug is injected and the skin is released to avoid leakage of dextran into the subcutaneous tissue) <sup>(3)</sup>.

6- Iron sucrose (i.v only) can be administered **undiluted as a slow IV injection** (rate not to exceed 20 mg/minute) **or as an IV infusion** (dilute in a maximum of 100 mL of 0.9% NaCl and infuse at a rate of 100 mg for 15 minutes).

**A test dose is not indicated for this agents** because of the lower incidence of serious anaphylactoid reactions <sup>(3)</sup>.

Parenteral iron			
	Scientific name	Trade names	Dosage form
1	Iron dextran	<b>Inferno</b> Comofer <small>(pharmacosmos)</small>	Amp. 50mg/mL
2	Iron sucrose	<b>Venofer</b> <small>(vifer)</small>	Vial 20mg/ mL

Any extra notes:

### 8.1.3-Folic acid

#### 1-Prevention of neural tube defects (NTD)

A-Folic acid supplements taken before and during pregnancy can **reduce the occurrence of neural tube defects** <sup>(2)</sup>.

B-For women of child-bearing potential at **high risk of having a pregnancy affected by NTD** ( e.g. if they have had a previous pregnancy affected by a neural tube defect), the dose of folic acid is **4 or 5 mg daily** starting before pregnancy (in the USA the recommendation is 4 weeks before) and continued through the first trimester (until week 12 of pregnancy) <sup>(2)</sup>.



C-For women at a **low risk of having a child with a NTD** the dose is **400 micrograms** daily and continued through the first trimester (until week 12 of pregnancy) <sup>(2)</sup>.

#### 2-Other indications for folic acid include <sup>(1)</sup>:

- A- Folate-deficient **megaloblastic anaemia**.
- B- Prevention of **methotrexate-induced side-effects**.
- C- Prophylaxis of **folate deficiency in dialysis**.

Scientific name	Trade names	Dosage form
Folic acid	Folacin	Tab. 0.4 , 1, 5 .

Any extra notes:

### 8.1.4-Glucose 6-phosphate dehydrogenase (G6PD) deficiency

1-Individuals with G6PD deficiency are susceptible to **developing acute haemolytic anaemia when they take a number of common drugs** <sup>(1)</sup>.

#### Drugs with definite risk of haemolysis in most G6PD-deficient individuals

Dapsone and other sulfones (higher doses for dermatitis herpetiformis more likely to cause problems)

Methylthioninium chloride

Niridazole [not on UK market]

Nitrofurantoin

Pamaquin [not on UK market]

Primaquine (30 mg weekly for 8 weeks has been found to be without undue harmful effects in African and Asian people, see section 5.4.1)

Quinolones (including ciprofloxacin, moxifloxacin, nalidixic acid, norfloxacin, and ofloxacin)

Rasburicase

Sulfonamides (including co-trimoxazole; some sulfonamides, e.g. sulfadiazine, have been tested and found not to be haemolytic in many G6PD-deficient individuals)

#### Drugs with possible risk of haemolysis in some G6PD-deficient individuals

Aspirin (acceptable up to a dose of at least 1 g daily in most G6PD-deficient individuals)

Chloroquine (acceptable in acute malaria and malaria chemoprophylaxis)

Menadione, water-soluble derivatives (e.g. menadiol sodium phosphate)

Probenecid [not on UK market]

Quinidine (acceptable in acute malaria) [not on UK market]

Quinine (acceptable in acute malaria)

### 8.2-Intravenous fluids

**1-Intravenous sodium:** Sodium chloride in isotonic solution (0.9%) provides the most important extracellular ions in near physiological concentrations and is indicated in sodium depletion, which can arise from such conditions as **gastro-enteritis** <sup>(1)</sup>.

**2- Intravenous glucose (dextrose):** Intravenous glucose (5%) is **used mainly to replace water deficit** and should not be given alone except when there is no significant loss of electrolytes. Glucose solutions are also used to correct and prevent hypoglycaemia and to provide a source of energy in those too ill to be fed adequately by mouth <sup>(1)</sup>.

3- Sodium chloride and glucose solutions are indicated when there is combined water and sodium depletion <sup>(1)</sup>.

Intravenous fluids			
	Scientific name	Trade names	Dosage form
1	Dextrose monohydrate	Glucose Water	500—1000mL 5% , 10% , 20% .

2	<b>Sodium Chloride</b>	<b>Normal saline</b>	500—1000 mL 0.9%
3	<b>Dextrose 5% + Sodium Chloride 0.9%</b>	<b>Glucose saline</b>	500—1000mL
4	<b>Na<sup>+</sup> , Ca<sup>++</sup> , K<sup>+</sup> , Cl<sup>-</sup></b>	<b>Ringer</b>	500—1000 mL

**Any extra notes:**

## 8.3-Minerals and Electrolyte

### 8.3.1-Calcium supplements

1- Calcium salts are used in the management of **hypocalcaemia** and **calcium deficiency states** resulting from dietary deficiency or ageing <sup>(2)</sup>.

2- **Intravenous calcium (calcium gluconate)** salts are also used to reverse the toxic cardiac effects of potassium in the emergency treatment of severe **hyperkalaemia (calcium act to protect the heart from hyperkalaemia)** <sup>(2)</sup>.

3-Calcium **carbonate** or acetate are **effective phosphate binders** and are given orally (with food) to **reduce phosphate absorption from the gut in patients with hyperphosphataemia**; this is particularly relevant to patients with **chronic renal failure** <sup>(2)</sup>.

4-Oral calcium supplements can also be used as an adjunct in the management of **osteoporosis** <sup>(2)</sup>.

### 8.3.2-Phosphate-binding agents

1-Calcium-containing preparations are used as phosphate-binding agents in the management of hyperphosphataemia complicating renal failure <sup>(1)</sup>.

2-**Sevelamer** hydrochloride and sevelamer carbonate are both licensed for the treatment of hyperphosphataemia in patients on haemodialysis or peritoneal dialysis <sup>(2)</sup>.

### 8.3.3-Potassium

1-Potassium salts are used for the prevention and treatment of **hypokalaemia** <sup>(2)</sup>.

2-An **intravenous potassium** salt (KCL) may be required in **severe acute hypokalaemia** <sup>(2)</sup>.

### 8.3.4-Zinc

1- Zinc supplement is **used for zinc deficiency**.

2-**Important** : Zinc supplements have been shown to reduce the incidence, intensity, or duration of acute diarrhoea in children in developing countries . **The WHO/UNICEF** recommend that children with acute diarrhea also receive zinc (10 mg of elemental zinc/day for infants younger than 6 months; 20 mg of elemental zinc/day for older infants and children) for 10 to 14 days.

3- Zinc prevents the **absorption of copper in Wilson’s disease**.

Minerals and Electrolyte			
	Scientific name	Trade names	Dosage form
1	<b>Calcium carbonate</b> <b>Calcium gluconate</b>	Calcium	Efferv.tab. , syrup , tab.
2	<b>Magnesium sulfate</b>	Magnesium	Syrup , tab. , Efferv.tab. , amp.
3	<b>Zinc sulfate</b>	Selvazinc <sup>(Galen)</sup>	Efferv.tab. ,tab. , syrup
4	<b>Selenium</b>	Selenase	Tab. , syrup

**Any extra notes:**

## 8.4-Vitamins

### 8.4.1-Vitamin A:

1-Vitamin A, a fat-soluble vitamin, is essential for growth, for the development and maintenance of epithelial tissue, and for vision <sup>(2)</sup>.

2-Vitamin A is used in the treatment and prevention of vitamin A deficiency. **Vitamin A has also been used to treat various skin disorders including acne and psoriasis** <sup>(2)</sup>.

3-In view of evidence suggesting that high levels of vitamin A may cause birth defects (**teratogenic**), women who are (or may become) **pregnant**

**are advised not to take vitamin A supplements** ( except on the advice of a doctor ); nor should they eat liver <sup>(1)</sup>.

(The American College of Obstetricians and Gynecologists has recommended that women who are pregnant or planning pregnancy should ensure that any vitamin supplements they take contain a daily dose of vitamin A of no more than 5000 units. The Australian Adverse Drug Reactions Advisory Committee has advised women in this category to avoid vitamin A supplements and to not exceed the recommended daily allowance of 2500 units from all sources) <sup>(2)</sup>.

### 8.4.2-Vitamin B Substances

Vitamin B	Scientific name	Uses
<b>B1</b>	<b>Thiamine</b>	Thiamine is used in the treatment and prevention of thiamine deficiency <sup>(2)</sup> .
<b>B2</b>	<b>Riboflavin</b>	Riboflavin is used in the treatment and prevention of riboflavin deficiency <sup>(2)</sup> .
<b>B6</b>	<b>Pyridoxine</b>	-Pyridoxine is used in the treatment and prevention of pyridoxine deficiency states <sup>(2)</sup> . - Prevention of <b>isoniazid-induced neuropathy</b> <sup>(2)</sup> . - Treatment of <b>premenstrual syndrome</b> <sup>(2)</sup> .
<b>B12</b>	<b>Cobalamins</b>	-Vitamin B12 is used in the treatment and prevention of vitamin B12 deficiency <sup>(2)</sup> . - Treatment of B12- <b>deficient megaloblastic anaemias</b> <sup>(2)</sup> .

### 8.4.3-Vitamin C (Ascorbic acid)

Claims that vitamin C ameliorates colds or promotes wound healing **have not been proved** <sup>(1)</sup>.

### 8.4.4-Vitamin D

1-The term Vitamin D is used for a range of compounds which possess the property of preventing or curing rickets. They include ergocalciferol (calciferol, vitamin D2 ), colecalciferol (vitamin D3 ), alfacalcidol (1- $\alpha$  hydroxycholecalciferol), and calcitriol (1,25-dihydroxycholecalciferol) <sup>(1)</sup>.

2-Vitamin D requires hydroxylation by the kidney to its active form, **therefore the hydroxylated derivatives alfacalcidol or calcitriol should be prescribed if patients with severe renal impairment require vitamin D therapy** <sup>(1)</sup>.

3-Preparations containing calcium with Vitamin D are available for the management of combined calcium and vitamin D deficiency <sup>(1)</sup>.

#### 8.4.5-Vitamin E

1-Vitamin E is used in the treatment and prevention of vitamin E deficiency <sup>(2)</sup>.

2- Vitamin E has been tried for various other conditions **but there is little scientific evidence of its value** <sup>(1)</sup>.

#### 8.4.6-Vitamin K

1-Vitamin K is necessary for the **production of blood clotting factors** <sup>(1)</sup>.

2-Vitamin K compounds are used in the treatment and prevention of **haemorrhage associated with vitamin K deficiency** <sup>(2)</sup>.

3-Because vitamin K is fat soluble, patients with fat malabsorption, especially in biliary obstruction or hepatic disease, may become deficient. **Menadiol sodium phosphate is a water-soluble synthetic vitamin K derivative** that can be given orally to prevent vitamin K deficiency in malabsorption syndromes <sup>(1)</sup>.

Vitamins			
	Scientific name	Trade names	Dosage form
1	<b>Retinol</b>	Vit. A	Tab., cap. 400 I.U syrup 200 I.U /mL
2	<b>Thiamine</b>	Vit. B <sub>1</sub>	In oral & injection vit. B complex
3	<b>Riboflavin</b>	Vit. B <sub>2</sub>	In oral & injection vit. B complex
4	<b>Pyridoxine</b>	Vit. B <sub>6</sub>	Tab. 60mg, Amp. 10, 20, 50 /mL .
5	<b>Ascorbic acid</b>	Vit. C	Efferv,.tab. , Tab.50,100, 200,500
6	<b>Ergocalciferol Coercalciferol</b>	Vit. D <sub>2</sub> Vit. D <sub>3</sub> , Dibase <sup>(Abiogen)</sup>	Tab. ,efferv.tab. , syrup, Amp. 100000 I.U/ 2mL.
7	<b>a-Tocopherol acetate</b>	Vit.E	Cap.400 I.U
8	<b>Menadiol Phytomenadione</b>	Vit.K Vit.K <sub>1</sub>	Tab. 10 . Cap.1 , Amp.10mcg/mL
9	<b>Mthylcobalamin</b>	Vit.B <sub>12</sub>	Amp. 1mg/2mL . Tab. 1mg .

**Any extra notes:**

### 8.4.7-Multivitamin preparations

1-It is generally considered **that healthy persons eating a normal balanced diet should have no need for vitamin supplementation** <sup>(2)</sup>.

2-Supplementation should concentrate **on groups of people at risk of deficiency** such as pregnant and lactating women, who need calcium, folic acid, and iron; and certain groups who need vitamin D. A multivitamin supplement might be considered for some groups such as the elderly and those with reduced calorie intake <sup>(2)</sup>.

<b>Multivitamin preparations</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Fe, folic acid , vit. B<sub>12</sub>,B<sub>1</sub>,B<sub>2</sub>, C Nicotinamide</b>	Ironorm	Gelatin cap.
2	<b>Fe ,folic acid , vit. B<sub>6</sub> , B<sub>12</sub></b>	Feroglobin <sup>(vitabiotic)</sup>	Gelatin cap.
3	<b>Vit.B<sub>1</sub>,B<sub>2</sub>,B<sub>6</sub>,B<sub>12</sub> Ca-pantothenate</b>	Vit. B complex	Cap. , Amp.
4	<b>Vit. A, B<sub>1</sub>,B<sub>2</sub>,B<sub>6</sub>,B<sub>12</sub>,C,D<sub>3</sub>,E ,folic acid, Zn , Selenium , Fe</b>	Multi-vitamin	Gelatin cap.

**Any extra notes:**

### 8.5-Drugs used in metabolic disorders

#### Wilson's disease

1-Penicillamine is used in Wilson's disease to aid the elimination of copper ions<sup>(1)</sup>.

2-Zinc prevents the absorption of copper in Wilson's disease <sup>(1)</sup>.

<b>Scientific name</b>	<b>Trade names (if available)</b>	<b>Dosage form</b>
<b>Penicillamine</b>	<b>Cuprimine Distamine</b> <sup>(Alliance)</sup>	Tab. 125 , 250 .

**Any extra notes:**

### **References**

1- BNF 61

2- Sean C. Sweetman. Martindale: The Complete Drug Reference, 36th Edition. Pharmaceutical Press 2009.

3- Mary Anne koda-kimble (ed.), Applied Therapeutics: The clinical use of drugs, 10th ed.2013.

4- Joseph T. DiPiro, Robert L. Pharmacotherapy: A Pathophysiologic Approach, 8th Edition. 2011.

## Chapter Nine: Musculoskeletal and joint diseases

### 9.1-Non-steroidal anti-inflammatory drugs (NSAIDs)

1-NSAIDs have **analgesic, anti-inflammatory, and antipyretic** properties. NSAIDs are used for the relief of mild to moderate **pain**, minor **febrile conditions**, and for **acute and chronic inflammatory disorders** such as osteoarthritis, and rheumatoid arthritis <sup>(1)</sup>.

2-Some NSAIDs **are applied topically** for the relief of muscular and rheumatic pain, and some (like diclofenac ) are used in **ophthalmic preparations** for ocular inflammatory disorders <sup>(1)</sup>.

3-The **commonest adverse effects of NSAIDs** are **generally gastrointestinal disturbances, such as gastrointestinal discomfort** . These are usually mild and reversible but in some patients peptic ulceration and severe **gastrointestinal bleeding** may occur <sup>(1)</sup>.

4- NSAIDs are **contra-indicated in patients with peptic ulceration**.

5- To reduce the risk of gastrointestinal effects:

A- NSAIDs **may be taken with or after food or milk**.

B- Taking **histamine H2-antagonists, or proton pump inhibitors** such as omeprazole.

C- Using **enteric-coated formulations** <sup>(1, 2)</sup>.

D- Using some NSAIDs like **celecoxib** (called selective COX-2 inhibitors) where the risk of serious upper gastro-intestinal side effects is lower with selective inhibitors compared to non-selective NSAIDs <sup>(1, 2)</sup>.

6- NSAIDs should be used with **caution** in patients with **asthma , and hypertension** (it cause sodium and water retention) <sup>(1)</sup>.

7-**Important : Use of more than one NSAID together should be avoided** because of the increased risk of adverse effects <sup>(1)</sup>.

8-Owing to an association with **Reye's syndrome**, aspirin should not be given to **children under 16 years**, unless specifically indicated <sup>(2)</sup>.

<b>NSAIDs</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Celecoxib</b>	<b>Celebrex</b> (Pharmacia)	Cap.100 ,200 .
2	<b>Diclofenac</b>	<b>Voltorol</b> <sup>(Novartis)</sup> <b>Voltarene ,</b> <b>Olfen</b> .	Tablet (immediate and sustained release), capsule (enclosing enteric coated or modified release granules), gel, injection, patch, suppository, eye drop.

3	<b>Ibuprofen</b>	<b>Brufen</b> <sup>(Abbott healthcare)</sup>	Tab. 200, 400 , 600, susp. 100/5mL
4	<b>Indomethacin</b>	<b>Indocin</b>	Cap.25 , supp. 50 , 100 .
5	<b>Mefenamic Acid</b>	<b>Ponstan</b> <sup>(Chemidex)</sup>	Cap.250 ,tab . 500 , susp. 50/ 5mL
6	<b>Meloxicam</b>	<b>Mobic</b>	Tab. 7.5 , 15 , Amp. 15mg/1.5mL
7	<b>Naproxen</b>	<b>Naprosyn</b> <sup>(Roche)</sup> Anaprox	Tab. 250 , 500, susp. 125/ 5mL
8	<b>Piroxicam</b>	<b>Feldene</b> <sup>(Pfizer)</sup> <b>Brexinol</b> <sup>(Chiesi)</sup>	Cap. 10 , 20 , tab. 20 , supp. 20 , Amp. 20mg/2mL
9	<b>Aspirin</b>	<b>Aspegic</b>	Powder 500 , 1000 , tab. 100, 300 .
10	<b>Tenoxicam</b>	<b>Mobiflex</b> <sup>(Meda)</sup>	Tab. 20

<b>Any extra notes:</b>			
<b>11</b>	<b>Ketorolac</b>	<b>Rolac , Toradol</b>	<b>tab. 10 , Amp. 30/ 2mL</b>
<b>12</b>	<b>Ketoprofen</b>	<b>Orudis</b> <sup>(Sanofi-Aventis)</sup>	<b>cap. 50 , 100 , supp.100</b>

## 9.2- Glucosamine and Chondroitin

1-The glucosamine sulfate and chondroitin sulfate are dietary supplements. Both compounds are found naturally in the body and are **essential to the formation of cartilage** (The combination is believed to have a synergistic effect by **stimulating cartilage production**(glucosamine) and **inhibiting its destruction** (chondroitin).

2- It is used for mild to moderate **osteoarthritis of the knee**. Therapy should continue For several months.

<b>Glucosamine and Chondroitin</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>D-glucosamine + Ginkgo Biloba</b>	<b>Dorofen</b>	Cap. 500+50
2	<b>D-glucosamine sulfate 750, Chondroitin sulfate 60 , MSM 300, Ginger extracte 20 .</b>	<b>Bioflox</b> <sup>(Bioactive )</sup>	Efferv. Tab. , cap.

<b>Any extra notes:</b>			
<b>3</b>	<b>Glucosamine sulfate</b>	<b>Fancital</b>	<b>powder 1.5 g</b>

### 9.3-Rubefacients, topical NSAIDs, and capsaicin

1-They may provide some relief of **pain in musculoskeletal conditions**.

<b>Rubefacients, topical NSAIDs, and capsaicin</b>			
	<b>Content(s)</b>	<b>Trade names</b>	<b>Dosage form</b>
1	Oleoresin of capsicum , camphor , turpentine oil , peppermint oil , methylsalicylate , menthol .	<b>Rheumalgin®</b>	<b>Ointment</b>
2	Diethylamine salicylate +menthol	<b>Algesin ®</b>	<b>Cream</b>
3	turpentine oil , menthol , camphor , naiauh oil , eucalyptus oil , thymol .	<b>Smicks ®</b> <b>Moov®</b>	<b>Ointment</b> <b>Gel</b>
4	<b>Diclofenac diethylamine</b>	<b>Voltaren®, olfen®</b>	<b>Gel</b>
5	Diclofenac , menthol , methylsalicylate , oleum lini .	<b>Divon®</b>	<b>Gel</b>
6	<b>Ketoprofen</b>	<b>Fastium®</b>	<b>Gel 2.5%</b>

### 9.4-Drugs for gout

1- **Acute attacks of gout**

**Acute attacks of gout** are usually treated with high **doses of NSAIDs**.

**Colchicine** is an alternative in patients in whom NSAIDs are contra-indicated.

2- **Prophylactic therapy of gout** : e.g. Allopurinol which decrease serum uric acid concentration.

3-**Note** : Allopurinol is also used as a prophylaxis against uric acid stone.

<b>Drugs for gout</b>		
<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>Allopurinol</b>	<b>Zyloric</b> <sup>(GSK)</sup>	Tab. 100 , 300 .
<b>Colchicine</b>	<b>Colchicine</b>	Tab. 0.5 mg .

## 9.5-Local corticosteroid injections

**1- Intra-articular corticosteroid injections** (e.g. Methylprednisolone or Triamcinolone) may be useful when **only a few joints** are affected in case of osteoarthritis and rheumatoid arthritis. They are also injected locally in **some other conditions**.

Local corticosteroid injections			
	Scientific name	Trade names	Dosage form
1	<b>Methylprednisolone</b>	<b>Depo-medrol®</b>	Amp. 40 , 80 , tab.4
2	<b>Triamcinolone acetonide</b>	<b>Kenacort ®</b> (squiibb)	Amp. 40mg/mL

**Any extra notes:**

## 9.6-Skeletal muscle relaxants

- 1-These drugs are used for the relief of **muscle spasm or spasticity** .
- 2-Examples are : **Baclofen, diazepam, orphenadrine** and **carisoprodol**.
- 3-Some of these drug (like **carisoprodol**) may be abused by some individual (addicts).

Skeletal muscle relaxants			
	Scientific name	Trade names	Dosage form
1	<b>Paracetamol + Orphenadrine</b>	<b>Norgesic®, myogesic®, kanagesic®</b>	Tablet
2	<b>Carisoprodol Caffeine , para.</b>	<b>Somadril compound®</b>	Tablet
3	<b>Baclofen</b>	<b>Lioresal®</b> (Novartis)	Tablet 5, 10 , 25 amp.0.5/mL , syrup5mg/5mL
4	<b>Diazepam</b>	<b>Valium</b>	Tab. 2, 5, 10 . syr.2/5mL Amp. 1mg/1mL

**Any extra notes:**

## 9.7-Disease-modifying anti-rheumatic drugs (DMARDs)

1-These drugs affect the immune response and can suppress **the disease process in rheumatoid arthritis** which is the main indication of them . Examples are **penicillamine, hydroxychloroquine, chloroquine, Methotrexate and sulfasalazine** <sup>(2)</sup> .

2- Hydroxychloroquine, and chloroquine **can cause ocular (eye) toxicity**, therefore the patient should be asked **about visual symptoms and monitor visual acuity annually** using the standard reading chart <sup>(2)</sup> .

3- Methotrexate is usually given **once weekly**.

DMARDs			
	Scientific name	Trade names	Dosage form
1	Penicillamine	Cuprimine Distamine <sup>(Alliance)</sup>	Tab. 125, 250 .
2	Hydroxychloroquine	Plaquenil <sup>(Sanofi Aventis)</sup>	Tab. 150 , 200 .
3	Chloroquine	Avalen or Medacoin	Tab. 150 , 200 .
4	Methotrexate	Maxtrex Metaject <sup>(Medoc)</sup>	Tab. 2.5 , 10 , Amp. 50mg/mL
5	Sulfasalazine	Sulazine Salazopyrin <sup>(pharmacia)</sup>	Tab.500 .

**Any extra notes:**

### References

1- Sean C. Sweetman. Martindale: The Complete Drug Reference, 36th Edition. Pharmaceutical Press 2009.

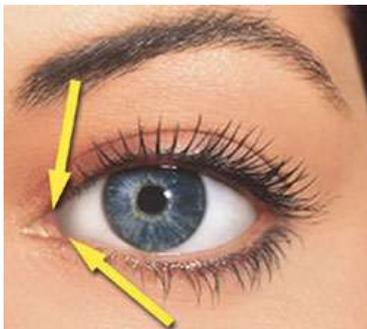
2-BNF 61.

## Chapter Ten : Eye

### 10.1-Administration of drugs to the eye

1-Administration guideline for eye drops and ointments are shown in the tables below <sup>(1)</sup>:

Administration Guidelines for Eye drops	Administration Guidelines for Eye ointment
<p>1-If you have difficulty telling whether eye drops have touched your eye surface, refrigerate the solution before instilling it. Do not refrigerate suspensions. Always check the expiration date.</p> <p>2-Wash hands thoroughly. Wash areas of the face around the eyes. Contact lenses should be removed unless the product is designed specifically for use with contact lenses.</p> <p>3-Tilt head back.</p> <p>4-Gently grasp lower outer eyelid below lashes, and pull eyelid away from eye to create a pouch.</p> <p>5-Place dropper over eye by looking directly at it, as shown in the drawing</p> <p>6-Just before applying a single drop, look up.</p> <p>7-As soon as the drop is applied, release the eyelid slowly. Close eyes gently for 3 minutes by placing your head down as though looking at the floor (using gravity to pull the drop onto the cornea). Minimize blinking or squeezing of the eyelid.</p> <p>8-Use a finger to put gentle pressure over the opening of the tear duct.</p> <p>9-Blot excessive solution from around the eye.</p>	<p>1-Wash hands thoroughly. Wash areas of the face around the eyes.</p> <p>2-If both drop and ointment therapy are indicated, instill the drops at least 10 minutes before the ointment so that the ointment does not become a barrier to the drops' penetrating the tear film or cornea.</p> <p>3-Tilt head back.</p> <p>4-Gently grasp lower outer eyelid below lashes, and pull eyelid away from eye as shown in the drawing</p> <p>5-Place ointment tube over eye by looking directly at it.</p> <p>6-With a sweeping motion, place one-fourth to one-half inch of ointment inside the lower eyelid by gently squeezing the tube, but avoid touching the tube tip to any tissue surface.</p> <p>7-Release the eyelid slowly.</p> <p>8-Close eyes gently for 1-2 minutes.</p> <p>9-Blot excessive ointment from around the eye.</p> <p>10-Vision may be temporarily blurred. Avoid activities that require good visual ability until vision clears.</p>



**ملاحظة :** تنص نقطة رقم 8 من طريقة استعمال القطرة أعلاه على قيام المريض مباشرة (بعد وضع القطرة وغلق العين) بتسليط ضغط بواسطة الإصبع ولمدة دقيقة على الأقل على الزاوية الداخلية للعين (الشكل المجاور) وذلك للتقليل من تسرب الدواء إلى الأنف بواسطة القناة الموجودة هناك.

**2-Important :** When two different eye-drop preparations are used at the same time of day, dilution and overflow may occur when one immediately

follows the other. The patient should therefore **leave an interval of at least 5 minutes between the two** <sup>(2)</sup>.

3- **Very important** : If using a suspension, **shake well before instilling**. If using the suspension with another dosage form, **place the suspension drop last**, because it has prolonged retention time in the tear film <sup>(1)</sup>.

Note : **most steroid** eye drops present as a **suspension**.

4- **Important**: If both **drop and ointment therapy are indicated**, instill the **drops at least 10 minutes before the ointment** so that the ointment does not become a barrier to the drops' penetrating the tear film or cornea <sup>(1)</sup>.

5- **Important**: Discard or replace eye drop bottles **30 days after the sterility safety seal is opened**( unless stated otherwise by manufacturer). The manufacturer's expiration date does not apply once the seal is broken <sup>(1)</sup>.

6- **Important**: Some eye drops (like **latanoprost (Xalatan®)**) need to **be stored at refrigerator**.

7-Patients should be warned **not to drive or perform other skilled tasks until vision is clear after using eye drops or eye ointments** <sup>(2)</sup>.

8- It is common to **use drops during the day and then use eye ointment in the evening or at night** upon retiring when the blurring of vision will be less inconvenient <sup>(3)</sup>.

9-**Contact lenses and drug treatment**: In general, patients should be counseled **not to place any ophthalmic solution, suspension, gel, or ointment into the eye when contact lenses are in place** <sup>(1)</sup>. The **lenses should be removed before drop instillation and not worn during the period of treatment** <sup>(2)</sup>.

## **10.2-Antibacterials eye preparations**

1-Bacterial **eye infections are generally treated topically** with eye drops and eye ointments <sup>(2)</sup>.

2- Common antibacterials available as an eye preparations include <sup>(2)</sup>:

A- Chloramphenicol.

B- Quinolones: ciprofloxacin, levofloxacin, moxifloxacin, and ofloxacin.

C- Aminoglycosides : gentamicin, neomycin , and tobramycin

D- Polymyxin B.

E- Fusidic acid.

3- Many antibacterial preparations are also **combined with a corticosteroid** (see corticosteroid below) <sup>(2)</sup>.

4- **Frequency** of application depends on the severity of the infection (sometimes they are applied **as frequent as 1 drop every 2 hours**) <sup>(2)</sup>.

<b>Antibacterials alone</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Fusidic acid</b>	<b>Fusithalmic</b> <sup>(LEO)</sup>	Eye drop , ointment
2	<b>Gentamicin</b>	<b>Genedin</b>	Eye drop , ointment
3	<b>Tobramicin</b>	<b>Tobravisc</b> <sup>(Alcon)</sup>	Eye drop
4	<b>Tetracycline</b>	<b>Sumycin</b> or Tetra.	Eye ointment
5	<b>Ciprofloxacin</b> <b>Oflaxacin</b>	<b>Ciloxan</b> <sup>(Allergan)</sup> <b>Oflex</b> <sup>(Allergan)</sup> <small>Most common name is ciprodar .</small>	Eye drop
6-	<b>Choramphenicol</b>	<b>Chloromycetin</b> <sup>(mercury)</sup>	Eye drop , ointment

**Any extra notes:**

### **10.3-Antivirals**

1- Commonly used antivirals are **aciclovir (acyclovir) or ganciclovir for hrpes simplex infections** .

<b>Antivirals</b>		
<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>acyclovir</b>	<b>Zovirax</b> <sup>(GSK)</sup>	Eye ointment

### **10.4-Corticosteroids and other anti-inflammatory preparations**

1-Commonly used **corticosteroids** are : Betamethasone, Dexamethasone, Fluorometholone, Hydrocortisone, and Prednisolone <sup>(2)</sup>.

2- They are used to treat **inflammatory eye conditions** <sup>(2)</sup>.

3-They may be combined with anti-infective <sup>(2)</sup>.

4- **Other anti-inflammatory preparations** used for the topical treatment of inflammation and allergic conjunctivitis include **Sodium cromoglicate** (sodium cromoglycate), and **nedocromil sodium** <sup>(2)</sup>.

5-Diclofenac (which is one of the NSAIDs) eye drops may be used for **seasonal allergic conjunctivitis**. It is also indicated for the treatment of **eye inflammation after eye surgery** <sup>(2)</sup>.

<b>corticosteroids</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Prednisolone acetate 0.12% , 1%</b>	<b>Pred-mild® And Pred-forte®</b>	<b>Eye drop</b>
2	<b>Fluorometholone</b>	<b>FML® (Allergan)</b>	<b>Eye drop</b>
3	<b>Betamethasone 0.1%</b>	<b>Methadin®</b>	Eye drop
4	<b>Olopatadine</b>	<b>Opatanol® (Alcon)</b>	Eye drop
5	<b>Ketotifen fumarate</b>	<b>Zalidin ® (spectrum thea )</b>	Eye drop
6	<b>Fluriprpfen</b>	<b>Flurptic ® (Cooper)</b>	Eye drop

<b>Antibacterials with corticosteroids</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Betamethasone 0.1% Neomycin sulfate 0.5%</b>	<b>Methadin-N®</b>	<b>Eye drop</b>
2	<b>Dexamethasone 0.1% tobramycin 0.3%</b>	<b>Tobradex® (Alcon)</b>	<b>Eye drop</b>
3	<b>Polymyxin B. Neomycin and Dexamethasone.</b>	<b>PND®</b>	<b>Eye drop</b>
4	<b>Neomycin , polymyxin B , Dexamethasone</b>	<b>Maxitrol® (Alcon)</b>	<b>Eye drop</b>
5	<b>Dexamethasone 0.1%</b>	<b>Maxidex (Alcon)</b>	Eye drop

<b>Other anti-inflammatory preparations</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Diclofenac</b>	<b>Valtarene Diclogesic</b>	Eye drop
2	<b>Sodium cromoglicate</b>	<b>Allergotin or Crom Catacrom (moorfield )</b>	Eye drop

**Any extra notes:**



## 10.5-Drugs for dry eye (tear deficiency) (artificial tear preparations).

1-They act by stabilizing the tear film (by increasing the viscosity of tear → decrease evaporation)<sup>(1)</sup>.

2-Examples are : **Hypromellose (hydroxypropylmethylcellulose), Polyvinyl alcohol and Carbomers.**

3- Some of these products may be available as **pack that contain single dose eye drops** (e.g. 28 or 30 single dose eye drops that contain small volume usually 0.4 mL and **each drop is intended for single use only**).

4- Some of these product may be available as **preservative free** eye drops. If a patient is likely to be **using artificial tears for a long time**, a preservative-free preparation should be considered because the prolonged exposure of the eye to the preservative (mostly it is **benzalkonium chloride**) can produce damage to the cornea.

Artificial tear preparations			
	Scientific name	Trade names	Dosage form
1	<b>Dextran hypromellose</b>	<b>Tear naruale</b> <sup>(Alcon)</sup>	Eye drop
2	<b>Sod. Hyaluronate</b>	<b>Hyfresh</b> <b>Hylo- tear</b> <sup>(scope ophthalmics)</sup>	Eye drop

**Any extra notes:**

## 10.6-Antiglaucoma Drugs

1- Drugs that **reduce intra-ocular pressure** by different mechanisms are available for managing glaucoma <sup>(2)</sup>. **All are used topically except actazolamide** which is available as an oral tablet (and less commonly as an injection).

2- Antiglaucoma drugs include:

	Pharmacological class	Examples
1	<b>Topical beta-blockers</b>	<b>Timolol, and betaxolol</b>
2	<b>Prostaglandin analogues and prostamides</b>	<b>Latanoprost, travoprost and bimatoprost</b>

3	<b>The carbonic anhydrase inhibitors</b>	<b>Acetazolamide (systemic administration), Brinzolamide (Topical), and dorzolamide(Topical)</b>
4	<b>Parasympathomimetic</b>	<b>Pilocarpine</b>
5	<b>Sympathomimetics (selective <math>\alpha_2</math>- agonists)</b>	<b>Brimonidine</b>

3- Sometimes, it may be necessary to **combine two or more of these drugs** to control intra-ocular pressure <sup>(2)</sup>.

4-**Important** : eye drops containing **beta-blockers should not be used** in patients with **asthma or a history of obstructive airways disease** (unless no alternative treatment is available. In such cases the risk of inducing **bronchospasm** should be appreciated and appropriate precautions taken) <sup>(2)</sup>.

5- **Important: Prostaglandin analogues** are usually **applied once daily, preferably in the evening** <sup>(2)</sup>. (may be more effective).

6- **Important: Prostaglandin analogues** may cause, darkening, thickening and lengthening of eye lashes <sup>(2)</sup>( reversible upon stopping treatment) <sup>(4)</sup>.

<b>Antiglaucoma drugs (single drug preparations)</b> (please try to select drugs from different classes)			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Timolol maleate 0.25% , 0.5%</b>	<b>Timoptol</b> <sup>(MSD)</sup>	Eye drop
2	<b>Catanoprost</b>	<b>Xalatan</b> <sup>(Pfizer)</sup>	Eye drop
3	<b>Brimonidine tartarate</b>	<b>Alphagan</b> <sup>(Allergan)</sup>	Eye drop
4	<b>Dorzolamide HCl</b>	<b>Trusept</b> <sup>(MSD)</sup>	Eye drop
5	<b>Travaprost</b>	<b>Travatan</b> <sup>(Alcon)</sup>	Eye drop
6	<b>Betaxalol HCl</b>	<b>Betoptic</b> <sup>(Alcon)</sup>	Eye drop

<b>Antiglaucoma drugs (combined preparations)</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Dorzolamide +timolol</b>	<b>Xolamol</b> <b>Cosopt</b> <sup>(MSD)</sup>	Eye drop
2	<b>Latanoprost + timolol</b>	<b>Xolacom</b> <sup>(pharnacia)</sup>	Eye drop

**Any extra notes:**

## 10.7- Decongestants and decongestants-antihistamine combination<sup>(5)</sup>

1-Such preparation may be intended for the treatment of **allergic conjunctivitis**.

2-Common **decongestants-antihistamine combination** is (**Naphazoline-Antazoline**).

3- Oxymetazoline (**Nasordin**<sup>®</sup> eye/nose drop) is a decongestant used most commonly for **nose** (less commonly for eye) in Iraq.

<b>Decongestants and decongestants-antihistamine combination</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Naphazoline Antazoline</b>	<b>Ophthazolin</b>	Eye drop
2	<b>Oxymetazoline</b>	<b>Nasordin</b>	Nasal & eye drop

<b>Any extra notes:</b>			
3	<b>Naphazoline</b>	<b>Naphicon</b> <sup>(Alcon)</sup>	Eye drop .

### References

1- Rosemary R Berardi. Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care, 16th Edition . 2009.

2- BNF 61.

3- Mary Anne koda-kimble (ed.), Applied Therapeutics: The clinical use of drugs, 10th ed.2013.

4- Sean C. Sweetman. Martindale: The Complete Drug Reference, 36th Edition. Pharmaceutical Press 2009.

5-Iraqi drug guide. First edition.1990.

## Chapter Eleven: Ear, nose, and oropharynx

### 11.1-Drugs acting on the ear

#### 11.1.1-Administration of ear drop <sup>(3)</sup>:

##### Guidelines for administering Ear drop

1-Wash your hands with soap and warm water; then dry them thoroughly.

2-Carefully wash and dry the outside of the ear, taking care not to get water in the ear canal.

3-Warm eardrops to body temperature by holding the container in the palm of your hand for a few minutes. Do not warm the container in hot water. Hot eardrops can cause ear pain, nausea, and dizziness.

4-If the label indicates, shake the container.

5-Tilt your head (or have the patient tilt his or her head) to the side, as shown in drawing A. Or lie down with the affected ear up, as shown in drawing B. Use gentle restraint, if necessary, for an infant or a young child.

6-Open the container carefully. Position the dropper tip near, but not inside, the ear canal opening. Do not allow the dropper to touch the ear, because it could become contaminated or injure the ear. Eardrop bottles must be kept clean.

7-Pull your ear (or the patient's ear) backward and upward to open the ear canal (see drawing A). If the patient is a child younger than 3 years old, pull the ear backward and downward (see drawing B).

8-Place the proper dose or number of drops into the ear canal. Replace the cap on the container.

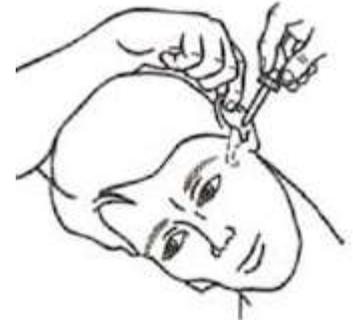
9-Gently press the small, flat skin flap (tragus) over the ear canal opening to force out air bubbles and push the drops down the ear canal.

10-Stay (or keep the patient) in the same position for the length of time indicated in the product instructions. If the patient is a child who cannot stay still, the primary care provider may tell you to place a clean piece of cotton gently into the child's ear to prevent the medication from draining out. Use a piece large enough to remove easily, and do not leave it in the ear longer than an hour.

11-Repeat the procedure for the other ear, if needed.

12-Gently wipe excess medication off the outside of the ear, using caution to avoid getting moisture in the ear canal.

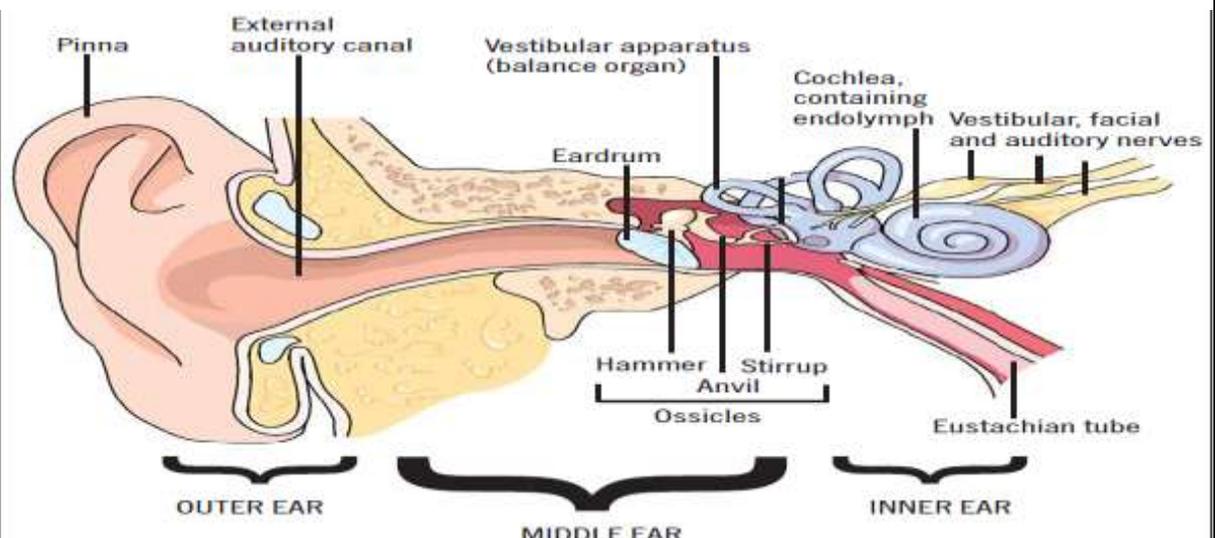
13-Wash your hands.



A



B



## 11.1.2-Treatment of otitis externa

1-Otitis externa is a general term used to describe inflammation of the skin of the external auditory canal that may be due to infection with bacteria, viruses, or fungi or secondary to skin disorders such as eczema <sup>(2)</sup>.

2- Otitis externa may be acute or chronic. The treatment of both acute and chronic otitis externa includes thorough cleansing and the **use of appropriate antibacterial ear drops, with or without a corticosteroid**, even though some have doubted the value of topical antibacterials <sup>(2)</sup>.

(Topical corticosteroids are used to treat inflammation and eczema in otitis externa. If infection is present, the corticosteroid should be used in combination with a suitable antiinfective ) <sup>(3)</sup>.

3-Ear drops containing aminoglycosides, such as gentamicin, neomycin, or framycetin, or polymyxins **should not be used when the ear drum is perforated because of the risk of ototoxicity** <sup>(2)</sup>.

<b>Ear products for otitis externa (Corticosteroids, Anti-infective, and combination products)</b>			
	<b>Trade names</b>	<b>Scientific name</b>	<b>Dosage form</b>
1	<b>Methadin®</b>	<b>Betamethasone 0.1%</b>	<b>Ear drop</b>
2	<b>Methadin-N®</b>	<b>Betamethasone 0.1%</b> <b>Neomycin sulfate 0.5%</b>	<b>Ear drop</b>
3	<b>Genedin ®</b>	<b>Gentamicin 0.3%</b>	<b>Ear drop</b>
4	<b>Otosporin®</b>	<b>Hydrocortisone, neomycin, polymyxin B</b>	<b>Ear drop</b>
5	<b>Synalar</b>	Flucinolone acetone , neomycin , Polymyxin B	Otic drop
6-	<b>Sofredex</b> <sup>(Sanofi- Aventis)</sup>	Dexamethasone ,framycetin , gramicidin	Ear & eye drop
7-	<b>Conestan</b> <sup>(Bayer consumer care)</sup>	Clotrimazole +PEG	Solution , otic drop

**Any extra notes:**

### 11.1.3-Treatment of otitis media

1-Otitis media is a general term used to **describe inflammation of the middle ear** that usually results from dysfunction of the Eustachian tube after a viral infection of the nasopharynx. **It is one of the most frequent childhood illnesses seen in general practice** <sup>(2)</sup>.

2-Acute otitis media is the commonest cause of severe ear pain in small children <sup>(2)</sup>.

3-However, it is common practice to prescribe a **systemic antibacterial** as well as an **analgesic**, although the need for routine antibacterial treatment is questionable <sup>(2)</sup>.

**Systemic** إي إن المضادات الحيوية في حالة الحاجة إليها لا تعطى موضعيا على شكل قطرة وإنما تعطى

4-The American Academy of Pediatrics has produced guidelines for the diagnosis and management of uncomplicated acute otitis media (AOM) in children from 2 months to 12 years of age. **They suggest that these children should be given symptomatic treatment and observed for 48 to 72 hours; if the illness worsens during the observation period or there is no improvement then systemic antibacterials should be considered** <sup>(2)</sup>.

5-Pain management is important, and appropriate analgesics should be offered. If antibacterial treatment is **given high dose** amoxicillin (80 to 90 mg/kg daily) is recommended for most children <sup>(2)</sup>.

### 11.1.4-Removal of ear wax (cerumen)

#### Nonpharmacologic Therapy

1- The only recommended nonpharmacologic method of removing cerumen is to use a **wet, wrung-out washcloth draped over a finger**.

**2-The common use of cotton-tipped swabs to remove earwax is ineffective and potentially dangerous**, increasing the risk of **otitis externa** and leading to **perforation** of the **eardrum**.

#### Pharmacologic Therapy (Cerumenolytics)

These agents used to soften ear wax examples are :

**1-Sodium bicarbonate (freshly prepared)**

This product should be instilled **two to three times a day for up to 3 days**.

**2-Docusate ((dioctyl sodium sulpho-succinate) (Dewax ®)**

The manufacturers of Dewax® recommend that adults and children use **enough ear drops to fill the affected ear on not more than two consecutive nights.**

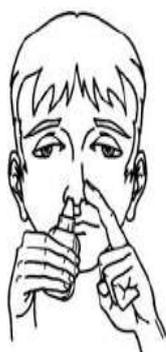
Cerumenolytics			
	Scientific name	Trade names	Dosage form
1	<b>dioctyl sodium sulpho-succinate</b>	Dewax®	<b>Ear drop</b>
2	<b>Docusate sodium 0,5%</b>	<b>Waxsol</b> (Meda)	<b>Ear drop</b>

## 11.2-Drugs acting on the nose

### 11.2.1- Administration of nasal preparations <sup>(1)</sup>.

#### Nasal Sprays

- Gently insert the bottle tip into one nostril, as shown in drawing A.
- Keep head upright. Sniff deeply while squeezing the bottle. Repeat with other nostril.



A

#### Pump Nasal Sprays

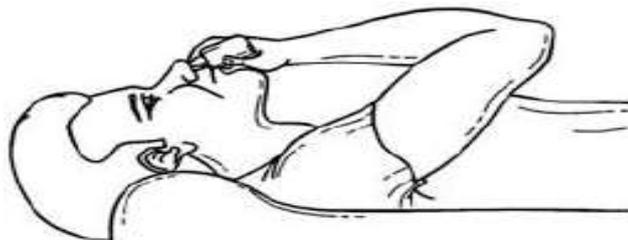
- Prime the pump before using it the first time. Hold the bottle with the nozzle placed between the first two fingers and the thumb placed on the bottom of the bottle.
- Tilt the head forward.
- Gently insert the nozzle tip into one nostril (see drawing B). Sniff deeply while depressing the pump once.
- Repeat with other nostril.



B

## Nasal Drops

- Squeeze the bulb to withdraw medication from the bottle.
- Lie on bed with head tilted back and over the side of the bed, as shown in drawing D.
- Place the recommended number of drops into one nostril. Gently tilt head from side to side.
- Repeat with other nostril. Lie on bed for a couple of minutes after placing drops in the nose.
- Do not rinse the dropper.



D

### Notes:

1-Nasal **sprays are preferable for adults and children aged over 6 years** because spray has a faster onset of action and cover a large surface area.

2-Nasal **drops are preferable for children aged below 6 years** because their nostrils are not sufficiently wide to allow effective use of sprays.

## 11.2.2-Drugs used in nasal allergy

### 11.2.2.1-Corticosteroids

1-Nasal preparations containing corticosteroids (beclometasone, betamethasone, budesonide, fluticasone, mometasone, and triamcinolone) have a useful role in the **prophylaxis and treatment of allergic rhinitis** <sup>(3)</sup>.

2-**Regular use** is essential for full benefit and **it take several days** before full effect is reached.

Corticosteroids (nasal preparations)			
	Scientific name	Trade names	Dosage form
1	<b>Betamethasone</b>	<b>Methadin®</b>	<b>Nasal drop</b>
2	<b>Beclometasone</b>	<b>Beconazse®</b> (A&H)	<b>Nasal spray</b>
3	<b>Budesonide</b>	<b>Rhinocort®</b> (Astra-Zeneca)	<b>Nasal spray</b>
4	<b>Mometasone</b>	<b>Nasonex®</b> (MSD)	<b>Nasal spray</b>
5	<b>Triamcinolone acetonide</b>	<b>Nasocort</b> (Sanofi Aventis)	

6	<b>Fluticasone propionate</b>	<b>Flixonase</b> <sup>(A&amp;H)</sup> <b>Flixonase Nasule</b> <sup>(A&amp;H)</sup>	Nasal spray Nasal drop
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**Any extra notes:**

### 11.2.2.2-Mast-cell stabilizers

1- Mast-cell stabilizers such as **nedocromil**, and **sodium cromoglicate**. They are an **alternative to corticosteroids in the prophylactic treatment of allergic rhinitis** <sup>(1)</sup> (but may be less effective) <sup>(3)</sup>.

Scientific name	Trade names	Dosage form
<b>Sod. Cromoglicate</b>	<b>Nasocrom</b>	Nasal drop , nasal spray

**Any extra notes:**

### 11.2.2.3-The topical antihistamine

1-The topical antihistamine azelastine is useful for controlling breakthrough symptoms in allergic rhinitis. Topical antihistamines are considered less effective than topical corticosteroids but probably more effective than cromoglicate <sup>(2)</sup>.

<b>The topical antihistamine(if available)</b>		
Scientific name	Trade names	Dosage form
<b>Azelastine HCl</b>	<b>Rhinlast</b> <sup>(Meda)</sup>	Nasal spray

### 11.2.3 Topical nasal decongestants

1- Intranasal sympathomimetics such as phenylephrine, naphazoline, oxymetazoline, and xylometazoline may be useful for **short-term treatment to relieve severe nasal congestion** <sup>(2)</sup>.

(Symptoms of nasal congestion associated with rhinitis and the common cold can be relieved by the short-term use (usually not longer than 7 days) of decongestant nasal drops and sprays) <sup>(3)</sup>.

2- **Not to use these product for longer than 7 days because of rebound congestion** (with congestion returning after stopping the drug often worse than before).

3-**Note:** some of these product may present **in two concentrations** (one for children and one for adults).

4- Nasal drop containing **normal saline** is preferred for infants (may relieve nasal congestion by helping to liquefy mucous secretions).

<b>Topical nasal decongestants</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Naphthazolin 0.025%,phenylephrine ,chlorobutol</b>	<b>Nasophrine ®</b>	Nasal drop .
2	<b>Oxymetazoline HCl 0.05% Benzalkonium chloride</b>	<b>Nasordin®</b>	Nasal drop .
3	<b>Xylometazoline</b>	<b>Otrivine®</b>	Nasal drop .
4	<b>Sodium chloride 0.9%</b>	<b>Otrivine saline®</b>	Nasal drop .
5	<b>Dimethidene maleate , Phenylephrine .</b>	<b>Vibrocil</b> <sup>(Novartis)</sup>	Nasal drop . Nasal spry .
6			
7			

**Any extra notes:**

### **11.3-Drugs acting on the oropharynx**

#### **11.3.1- Topical corticosteroids**

1-Triamcinolone acetone in orabase (oral paste) (**Kenalog in orabase®**) is used for mouth ulcer.

2- It is applied 2-4 times **daily after food** ( after food, as food is likely to rub the paste off).

	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
<b>1</b>	<b>Triamcinolone</b>	<b>Kenalog in orabase®</b>	<b>oral paste</b>

### 11.3.2-Topical antifungals

1- Topical antifungals for **oropharyngeal fungal infections (thrush)** include **nystatin** (as an oral drop (as a suspension)) and **miconazole** (as an oral gel).

2-Nystatin dose :

Adult and child, **100 000 units**(1ml of the drop) **4 times daily after food (hold in mouth)**, usually for 7 days (**continued for 48 hours after lesions have resolved**)<sup>(3)</sup>.

Topical antifungals for oropharyngeal fungal infections			
	Scientific name	Trade names	Dosage form
1	<b>Nystatin</b>	<b>Mycostatin</b>	Cream , ointment , tab . vaginal tab .
2	<b>Miconazole</b>	Fungoid <b>Daktarin</b> (Janssen )	Cream , oral gel ,

**Any extra notes:**

### 11.3.3-Mouthwashes and gargles

1-Mouthwashes are employed for the **improvement of oral hygiene**<sup>(4)</sup>. For example Chlorhexidine is an effective antiseptic which has the advantage of inhibiting plaque formation on the teeth<sup>(3)</sup>.

2- Notes regarding chlorhexidine Mouthwash:

A-Dose : rinse mouth **with 10 mL for about 1 minute twice daily**<sup>(3)</sup>.

B- It may cause **reversible brown staining of teeth**<sup>(3)</sup>.

C- Chlorhexidine gluconate may be incompatible with some ingredients in toothpaste; **leave an interval of at least 30 minutes between using mouthwash and toothpaste**<sup>(3)</sup>.

Mouthwashes and gargles			
	Scientific name	Trade names	Dosage form
1	<b>Chlorhexidine</b>	<b>Corsodyl®, Zak®</b>	<b>Mouthwash</b>
2	<b>hexetidine</b>	<b>Oraldene®</b>	<b>Mouthwash</b>
3	<b>Cinnamon</b>	<b>Close – up</b>	Mouth wash
4	<b>Povidone – iodine</b>	<b>Claridone</b>	Mouth wash & gargles

**Any extra notes:**

**References**

- 1- Rosemary R Berardi. Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care, 16th Edition . 2009.
- 2- Sean C. Sweetman. Martindale: The Complete Drug Reference, 36th Edition. Pharmaceutical Press 2009.
- 3-BNF 61.
- 4-Iraqi drug guide. First edition 1990.

## 12.1-Dermatologic Drug Delivery Systems

### 1-A range of dermatologic formulations is available:

solutions, suspensions or shake lotions, powders, lotions, emulsions, gels, creams, ointments, and aerosols. Each dermatologic delivery vehicle has specific characteristics and uses based on the type, and location of the lesion <sup>(1)</sup>.

2- **Powders** are used mainly in **intertriginous areas** (e.g., groin, under the breasts, or in skin folds) to decrease friction, which can cause mechanical irritation. They also are useful in the treatment of tinea pedis (athlete's foot), tinea cruris (jock itch), and diaper dermatitis (diaper rash).

3- **Lotions** are suspensions or solutions of powder in a water vehicle. They are especially advantageous in the treatment of conditions characterized by significant inflammation and tenderness. In these situations, creams or ointments may cause pain on application. *Also, lotions are useful for hairy areas of the body and scalp* <sup>(1)</sup>.

4- **Gels** are most useful when applied to **hairy areas or other areas such as the face or scalp**, where it is considered cosmetically unacceptable to have the residue of a vehicle remain on the skin <sup>(1)</sup>.

5- **Creams are the most commonly used vehicle in dermatology.** The most common mistake made by patients when applying creams is that **they use too much or do not rub them in fully.** Generally, if the cream can be seen on the skin after application, the patient has made one or both of these application mistakes <sup>(1)</sup>.

6- **Ointments are most useful on chronic lesions**, relieving dryness, brittleness, and protecting fissures owing to their occlusive properties. They should not be used on acutely inflamed lesions. Ointments should not be applied to intertriginous or hairy areas because they tend to trap heat and promote maceration. Ointments are greasy and may be cosmetically unacceptable <sup>(1)</sup>.

Appropriate Dermatologic Vehicle Selection Across the Range of Dermatologic Lesions

Range of Lesions	Range of Vehicles
<i>Acute inflammation:</i> Oozing, weeping, vesication, edema, pruritus ↓	Aqueous vehicles and water, and then powder solutions, lotions, sprays, and aerosols ↓
<i>Subacute inflammation:</i> Crusting, less oozing, pruritus ↓	Creams, gels ↓
<i>Chronic inflammation:</i> Lichenification, dryness, erythema, pruritus, scaling	Ointments

## 12.2-Common Skin Diseases by Body Location <sup>(1)</sup>.

Common Skin Diseases by Body Location

Location	Skin Diseases
Scalp	Seborrheic dermatitis, dandruff
Face	Acne, rosacea, seborrheic dermatitis, perioral dermatitis, impetigo, herpes simplex, atopic dermatitis
Ears	Seborrheic dermatitis
Chest or abdomen	Tinea versicolor, tinea corporis, pityriasis rosea, acne, herpes zoster
Back	Tinea versicolor, tinea corporis, pityriasis rosea
Genital area	Tinea cruris, scabies, pediculosis, condyloma acuminata (venereal warts)
Extremities	Atopic dermatitis (cubital and popliteal fossa)
Hands	Tinea manuum, scabies, primary irritant contact dermatitis, warts
Feet	Tinea pedis, contact dermatitis, onychomycosis
Generalized or localized	Primary irritant or contact dermatitis, photodermatitis

## 12.3-Anti-infective skin preparations

### 12.3.1-Antibacterial preparations

1-Topical antibacterials and antiseptics may be useful for superficial skin infections, but antibacterials should only be used short term because of the risks of inducing bacterial resistance and contact allergy <sup>(2)</sup>.

2-To minimize the development of resistant organisms it is **advisable to limit the choice of antibacterials applied topically to those not used systemically** <sup>(3)</sup>.

3-**Silver sulfadiazine is used in the treatment of infected burns.** In the community, acute **impetigo** (caused by *Staphylococcus aureus*) on small areas of the skin may be treated by short-term topical application of **fusidic acid** <sup>(3)</sup>.

Topical antibacterials			
	Scientific name	Trade names	Dosage form
1	<b>Fusidic acid</b>	<b>Fusidin</b> <sup>(LEO)</sup>	Cream , ointment
2	<b>Gentamicin</b>	<b>Gendin</b>	Cream , ointment
3	<b>Silver sulfadiazine</b>	<b>Flamazin</b> <sup>S&amp;N health</sup>	Cream 1%
4	<b>Tetracycline</b>	<b>Sumycin</b>	Ointment 2%
5	<b>Clindamycin</b>	<b>Cleocin</b>	Gel , solution ,ointment 1%

**Any extra notes:**

### 12.3.2-Antifungal preparations

1-Most localized fungal infections are treated with topical preparations <sup>(3)</sup>.

**2-Important:** To prevent relapse, local antifungal treatment **should be continued for 1–2 weeks after the disappearance of all signs of infection** <sup>(3)</sup>.

3-Topical antifungal available in Iraq include: The **imidazole antifungals** (clotrimazole, econazole, ketoconazole, and miconazole), **Terbinafinem**, **tolnaftate**, nystatin and **compound benzoic acid ointment** (Whitfield's ointment).

4- **Combination products of an antifungals and corticosteroids** are available to treat fungal infection associated with inflammation.

<b>Antifungal preparations (including Combination products)</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>ketaconazole</b>	<b>Nizoral</b> <small>(Janssen)</small>	Cream 2%
2	<b>Miconazole nitrate</b>	<b>Daktarin</b> <small>(Janssen)</small>	Cream 2%
3	<b>Clotrimazole</b>	<b>Canestan</b> <small>(Bayer consumer care)</small>	Cream 1% ,solution 1% ointment
4	<b>Econazole nitrate</b>	<b>Pevaryl</b> <small>(Janssen)</small>	Cream 1%
5	<b>Tioconazole</b>	<b>Trosyl</b> <small>(Pfizer)</small>	Cutaneous solution
6	<b>Tolnaftate</b>	<b>Tinactin</b>	Cream
7	<b>Nystatin</b>	<b>Mycostatin</b>	Cream ,ointment, vaginal tab.

**Any extra notes:**

### 12.3.3-Antiviral preparations

A-Aciclovir cream can be used for the treatment of initial and recurrent labial herpes simplex infections (cold sores) <sup>(3)</sup>.

**Important** : Aciclovir is best applied at the earliest possible stage, **usually when prodromal changes of sensation are felt in the lip and before vesicles appear** <sup>(3)</sup>.

**B-Systemic aciclovir treatment** may be necessary for example in **herpes zoster (shingles)** <sup>(3)</sup>.

Scientific name	Trade names	Dosage form
Aciclovir	Zovirax <sup>(GSK)</sup>	Cream 5% ,eye ointment, tab. Syrup

**Any extra notes:**

### 12.3.4-Parasiticidal preparations

#### 12.3.4.1-Scabies

1- **Permethrin cream (5% cream)** is the **drug of choice** due to ease of administration and high cure rate.

2- **The use of Benzyl benzoate emulsion is decline nowadays** because the cure rate is about 50% and up to 25% of patients experience side-effects such burning g , irritation and itching on application. In addition **it's application is less convenient than permethrin cream.**

Scientific name	Trade names	Dosage form	Application
Permethrin		5% Cream	The treatment is applied to the entire body, from neck down –words (including web spaces of fingers and toes, the genitalia, and under the nails ), but not the neck, face and scalp in adults. However in children age under 2 years and the elderly (aged 70 and over) the advice now is to include the scalp, neck, face (avoiding the eyes and mouth) and ear in the application unless the product packaging contraindicates this , they should be treated again with cream. Repeat application after 7 days.

<b>Benzyl benzoate</b>		<b>Emulsion</b>	<p>Application: Apply over the whole body except the head and neck and left to dry on skin, repeat (without bathing or washing of the first application) on the following day. The second application is washed off 24 hours later .</p> <p>A third application may be required in some cases.</p>
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**Any extra notes:**

### 12.3.4.2-Head lice

1-Head lice infestation (**pediculosis**) should be treated **using lotion or liquid formulations** (Shampoos are diluted too much in use to be effective) <sup>(3)</sup>.

2-A contact **time of 8–12 hours** or overnight treatment is recommended for lotions and liquids <sup>(3)</sup>.

3-In general, a course of treatment for **head lice should be 2 applications of product 7 days apart to kill lice emerging from any eggs that survive the first application.** All affected household members should be treated simultaneously <sup>(3)</sup>.

<b>Drugs for Head lice</b>				
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>	<b>Application</b>
<b>1</b>	<b>Dimeticone</b> 4%	<b>Hedrin</b> (Thornton & Ross)	Lotion	Rub into dry hair and scalp, allow to dry naturally, shampoo after minimum 8 hours (or overnight); repeat application after 7 days .
<b>2</b>	<b>Malathion</b> 0.5%	<b>Derbac-M</b> (SSL)	Solution	Head lice, rub 0.5% preparation into dry hair and scalp, allow to dry naturally, remove by washing after 12 hours , repeat application after 7 days .

**Any extra notes:**

## 12.4-Preparations for minor cuts and abrasions

These preparations are used **in minor burns, and abrasions**. They are applied as necessary but should not be used on large wounds or for prolonged periods because of the possibility of hypersensitivity <sup>(3)</sup>.

Scientific name	Trade names	Dosage form
<b>Cetrimide</b>	<b>Celavex ®</b>	<b>Cream</b>

## 12.5-Skin cleansers, and antiseptics

**1-Alcohol (Indications:** skin preparation before injection). (**Cautions :** flammable; avoid broken skin) <sup>(3)</sup>.

**2-Wound cleansing** is required to remove any dirt or foreign bodies and to **remove exudate** and slough (pus and necrotic tissue). This helps to prevent infection and aids healing. Commonly used cleansing solutions are **sodium chloride 0.9%, hypochlorite, hydrogen peroxide, povidone-iodine, and chlorhexidine** <sup>(2)</sup>.

**3-Wound dressings** and packing preparations help to protect the wound and provide the correct environment for wound healing. Some also help by absorbing exudates <sup>(2)</sup>. (e.g. **sofra-tulle®**).

<b>Skin cleansers, and antiseptics</b>			
	Scientific name	Trade names	Dosage form
1	<b>Alcohol</b>	<b>Surgical spirit</b>	solution
2	<b>Sodium chloride</b>	<b>Normasol</b>	soltion
3	<b>Chlorhexidine</b> <b>0.5%,1%,5%,4%,2.5%</b>	<b>Unisept</b> <sup>(Medlack)</sup>	Solution ,cream , dry dusting powder
4	<b>Povidine iodine</b>	<b>Videne</b> <sup>(Ecolab)</sup>	Alcohol tincture 10%
5	<b>Hydrogen peroxide</b>	<b>Crystacide</b> <sup>(Derma UK)</sup>	Cream1% ,solution 3-25%

**Any extra notes:**

## 12.6-Emollients and Barrier preparations

1-Emollients (like **Soft Paraffin**) soothe, **smooth and hydrate the skin** and are indicated for **all dry or scaling disorders** (like eczema) <sup>(3)</sup>.

2-Barrier preparations often **contain water-repellent substances** and are used to **protect the skin against hydration and irritations** as in **nappy rash**. example of barrier preparations are **Zinc Ointment, as well as Zinc and Castor Oil Ointment** <sup>(3)</sup>.

3-Notes concerning nappy rash <sup>(3)</sup> :

**A-**The first line of treatment is to ensure that **nappies are changed frequently**. The rash may clear when left exposed to the air and a barrier preparation can be helpful.

**B-**If the rash is associated with a **fungal** infection, an **antifungal cream such as clotrimazole cream is useful**.

**C-**A **mild corticosteroid such as hydrocortisone 1%** is useful in moderate to severe inflammation. The barrier preparation is applied after the corticosteroid preparation.

**D-**Preparations containing **hydrocortisone should be applied for no more than a week**.

<b>Emollients and Barrier preparations (including preparations for nappy rash)</b>			
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>
1	<b>Zinc oxide</b>	Zinc oxide	<b>Ointment</b>
2	<b>Zinc and castor oil 7%                      50%</b>	Zinc & castor oil	<b>Ointment</b>
3	<b>Hydrocortisone 1%, 2.5%</b>	H.C	Cream
4			

**Any extra notes:**

## 12.7-Topical local anaesthetics and antipruritics

1-An emollient may be of value where the pruritus is associated with dry skin <sup>(3)</sup>.

2-Preparations containing **crotamiton** are sometimes used but are of **uncertain value**. Preparations containing **calamine** are often ineffective <sup>(3)</sup>.

3-Topical **local anaesthetics** are only **marginally effective** and occasionally **cause sensitization**. For insect stings and insect bites, a **short course of a topical corticosteroid is appropriate**. Short-term treatment with an oral sedating antihistamine may help in insect stings where sedation is desirable <sup>(3)</sup>.

4-**Calamine** preparations are of **little value for the treatment of insect stings or bites** <sup>(3)</sup>.

Topical local anaesthetics and antipruritics			
	Scientific name	Trade names	Dosage form
1	<b>Crotamiton</b>	<b>Eurax</b> <sup>(Novartis-consumer health)</sup>	Cream 10%
2	<b>Calamine</b>	<b>Calamina</b>	Aqueous cream ,lotion
3	<b>Lidocaine</b>	<b>Zylocaine</b>	Gel 2% ,5%
4	<b>Doxepin HCl</b>	<b>Xepin</b> <sup>(CHS)</sup>	Cream

**Any extra notes:**

## 12.8-Topical Corticosteroids

1-Topical corticosteroids are used for the treatment of **inflammatory conditions of the skin** (other than those arising from an infection), in particular eczema, contact dermatitis, insect stings <sup>(3)</sup>.

2-Topical corticosteroids are of **no value in the treatment of urticaria** and they may **worsen ulcerated or secondarily infected lesions** <sup>(3)</sup>.

3- **Application:** A-Topical corticosteroids **should be applied no more than twice daily**. Increasing the application from twice daily to four times daily does

not produce superior responses, and may lead to increased frequency of topical and systemic adverse effects <sup>(1)</sup>.

B-One **fingertip** unit (approximately 500 mg) is sufficient to cover an area **that is twice that of the flat adult palm** <sup>(3)</sup>.



4- Preparations should be rubbed in thoroughly and, when possible, **applied while the skin is moist (e.g., after bathing)**.

Hydration of the skin increases percutaneous absorption and the resultant therapeutic effect of topical steroids <sup>(1)</sup>.

**5-Children, especially infants, are particularly susceptible to side-effects. A mild corticosteroid such as hydrocortisone 1% ointment or cream is useful for treating nappy rash and for atopic eczema in childhood .** A moderately potent or potent corticosteroid may be appropriate for severe atopic eczema on the limbs, for 1–2 weeks only, switching to a less potent preparation as the condition improves <sup>(3)</sup>.

**6-Thinning of the skin, telangiectasia** (a visible permanent dilatation of small Cutaneous blood vessels), localized **fine hair growth, hypopigmentation, and striae** ( pink, red or purple lines or bands) can result from repeated application of topical corticosteroids <sup>(1)</sup>.



7- **Prolonged use of a topical corticosteroid on the face should be avoided** <sup>(3)</sup>. *Some advocate using only hydrocortisone 0.5 or 1% on the face* <sup>(2)</sup>.

8-**Topical corticosteroid preparation potencies** <sup>(2)</sup>.

**Table 1. Guide to potencies of topical corticosteroids.**

Very potent	Potent	Moderately potent	Mild
Clobetasol propionate 0.05% Fluocinolone acetonide 0.2%	Amcinonide 0.1% Beclometasone dipropionate 0.025% Betamethasone benzoate 0.025% Betamethasone dipropionate 0.05% Betamethasone valerate 0.1% Fluocinolone acetonide 0.025% Fluocinonide 0.05% Hydrocortisone butyrate 0.1% Mometasone furoate 0.1% Triamcinolone acetonide 0.1%	Betamethasone valerate 0.025% Clobetasone butyrate 0.05% Fluocinolone acetonide 0.00625% and 0.01% Hydrocortisone aceponate 0.1% Hydrocortisone buteprate 0.1%	Fluocinolone acetonide 0.0025% Hydrocortisone 0.5% and 1% Hydrocortisone acetate 1%

<b>Topical Corticosteroids (including Combination products)</b>				
	<b>Scientific name</b>	<b>Trade names</b>	<b>Dosage form</b>	<b>potencies</b>
1	<b>Hydrocortisone 1% miconazole 2%</b>	<b>Daktacort</b> <sup>(Janssen)</sup>	Cream	
2	<b>Hydrocortisone 1% fusidic acid 2%</b>	<b>Fusidin -H</b> (LEO)	Cream	
3	<b>Betamethasone valerate</b>	<b>Betnovate</b> <sup>(GSK)</sup>	Cream , ointment , lotion	0.1%
4	<b>Betamethasone dipropionate &amp; S.A</b>	<b>Diprosalic</b> <sup>(GSK)</sup>	ointment	0.05% & 3%
5	<b>Clobetasol propionate</b>	<b>Dermovate</b> <sup>(GSK)</sup>	Cream ,oint. lotion	0.05%
6	<b>Fluocinolone acetanide</b>	<b>Synalar</b> <sup>(GP parma)</sup>	Cream , gel , lotion	0.025%
7	<b>Memetasone furoate</b>	<b>Elica</b> <sup>(MSD)</sup>	Cream ,oint. , lotion	0.1%
8	<b>Triamcinolone acetanide</b>	<b>Aureocort</b> (mercury)	Ointment ,oralpaste	0.1%

**Any extra notes:**

## **12.9-Shampoos and other preparations for scalp and hair conditions**

**1-Dandruff is considered to be a mild form of seborrhoeic dermatitis.**

Shampoos containing **selenium sulphide** may have beneficial effects.

**Ketoconazole** shampoo should be considered for more persistent or severe dandruff or for seborrhoeic dermatitis of the scalp<sup>(3)</sup>.

2-A cream or an ointment containing **coal tar and salicylic acid** is very helpful in psoriasis that affects the scalp <sup>(3)</sup>.

Shampoos and other preparations for scalp and hair conditions				
	Scientific name	Trade names	Dosage form	Application
1	<b>Ketoconazole 2%</b>		<b>shampoo</b>	<b>Note;</b> leave preparation on for 3–5 minutes before rinsing. 1-Treatment of seborrhoeic dermatitis and dandruff apply twice weekly for 2–4 weeks (prophylaxis apply once every 1–2 weeks). 2-Treatment of pityriasis versicolor apply once daily for max. 5 days (prophylaxis apply once daily for up to 3 days before sun exposure.
2	<b>selenium sulphide 2.5%</b>	<b>Selsun</b> (chabten UK )	<b>shampoo</b>	Seborrhoeic dermatitis and dandruff, apply twice weekly for 2 weeks then once weekly for 2 weeks and then as necessary.
3	<b>Coal tar 2.5% &amp; lecithin 0.3%</b>	<b>Psoriderm</b> (Dermal)	Scalp lotion	Scalp psoriasis , use as necessary
4	<b>Alcoholic coal tar 5%</b>	<b>Alphosyl</b> (GSK consumer )	shampoo	Dandruff, use once or twice weekly ,Psoriasis seborrhoeic dermatitis :use every 2-3 days

**Any extra notes:**

### 12.10-Preparations for psoriasis

1- Psoriasis is a chronic inflammatory skin disorder characterized by **enhanced epidermal proliferation** leading to erythema, **scaling**, and thickening of the skin <sup>(2)</sup>.

2- There are several types of psoriasis including guttate, flexural, pustular, and erythrodermic, **but chronic plaque psoriasis (psoriasis vulgaris) is the most common form.** In chronic plaque psoriasis the areas most commonly affected are the extensor

### Table 4. Therapies Used in the Treatment of Psoriasis

#### Topical Therapies

Emollients, keratolytics (salicylic acid, urea), omega fatty acids, corticosteroids, vitamin D analogues (calcitriol, calcipotriene, tacalcitol), tazarotene, anthralin, coal tar

#### Systemic Therapies

Methotrexate, cyclosporine, acitretin, fluorouracil, oral vitamin D, phototherapy, photochemotherapy

#### Biological Agents

Anti-TNFs (infliximab, adalimumab, etanercept), T-cell-targeted therapies (alefacept), monoclonal antibody (ustekinumab)

*TNF: tumor necrosis factor.*

sides of the knees, elbows, and hands, and the scalp and sacrum <sup>(2)</sup>.

3-**There is no cure** and treatment is designed to induce a remission or suppress disease to a tolerable level <sup>(2)</sup>.

4-**Drug therapy for psoriasis** are summarized in table 4.

5-**Topical drugs** are the treatment of first choice for chronic plaque psoriasis. Psoriasis refractory to topical therapy may respond to **systemic drugs** <sup>(2)</sup>.

Preparations for psoriasis (including both topical and systemic products)			
	Scientific name	Trade names	Dosage form
1	<b>Tar</b>	<b>Carbo-Dom</b> <sup>(Sandoz)</sup>	Oint. , cream ,solution .
2	<b>Methotrexate</b>	<b>Rheumatex</b>	Tab. 2.5, 5 , 10 .
3	<b>Tracrolimus</b>	<b>Protopic</b> <sup>(Astellas)</sup>	ointment
4	<b>Coal tar + fluocinolone</b>	<b>Tar – cinolone</b>	ointment

**Any extra notes:**

## 12.11-Acne and rosacea

### 12.11.1-Acne

1-**Mild acne** is treated topically, in particular with benzoyl peroxide, retinoids, and antibacterials <sup>(2)</sup>.

2-**Moderate acne** is best treated with oral rather than topical antibacterials, of which tetracyclines (Tetracycline, doxycycline) appear to be the drugs of first choice.. Alternatives to the tetracyclines include erythromycin, and co-trimoxazole <sup>(2)</sup>.

3-**Severe acne** is usually treated with **oral isotretinoin** <sup>(2)</sup>. (see below).

4- **Topical preparations for acne** include : **Benzoyl peroxide, azelaic acid, topical retinoid and topical antibacterials** <sup>(3)</sup>.

## 5- Specifics notes for the topical preparations for acne:

A- It is usual to **start with a lower strength and to increase the concentration of benzoyl peroxide gradually** (to minimize skin irritation)<sup>(3)</sup>.

**B-benzoyl peroxide can bleach clothing and bedding.** If it is applied at night, white sheets and pillowcases are best used and patients can be advised to wear an old T-shirt or shirt to minimize damage to good clothes.

**C-Topical antibacterials** are probably best reserved for patients who wish to avoid oral antibacterials or who cannot tolerate them. Topical preparations of **erythromycin and clindamycin** are effective for inflammatory acne<sup>(3)</sup>.

**D- Topical tretinoin**, its isomer isotretinoin, and adapalene (a retinoid-like drug), are useful for treating mild to moderate acne. Patients should be warned that some redness and **skin peeling** can occur initially but settles with time<sup>(3)</sup>.

**E- Important : Topical retinoids are contra-indicated in pregnancy;** women of child-bearing age must use effective contraception<sup>(3)</sup>.

### 12.11.2-Rosacea

**1-Rosacea** is a skin condition that is sometimes confused with acne . It is a common chronic inflammatory disorder of the **facial pilosebaceous** units, coupled with an increased reactivity of capillaries leading to **flushing and telangiectasia**. ( rosacea has characteristic features of reddening (**flushing**), **papules** (a raised solid lesion, usually less than 0.5 cm in diameter) and **pustules**(an accumulation of pus in the skin). In rosacea there are **no comedones (as in acne)**. (*Age of onset of rosacea is 30 to 50 years*).



**2-Oral antibacterials** (like: Tetracyclines (**doxycycline, tetracycline**) have been widely used, but clarithromycin, erythromycin, and metronidazole are suitable alternatives<sup>(2)</sup>.

**3-Topical therapies**, particularly **metronidazole and azelaic acid**, provide effective alternatives to oral drugs. Other topical therapies that may be useful include clindamycin, erythromycin, and retinoids<sup>(2)</sup>.

Topical preparations for acne			
	Scientific name	Trade names	Dosage form
1	<b>Benzoyl peroxide</b> 2.5% , 5%, 10%	<b>Panoxyl</b> <sup>(GSK)</sup>	Cream , Aquagel
2	<b>Azelaic acid</b>	<b>Skinoren</b> <sup>(Bayer)</sup>	Cream
3	<b>Clindamycin 1%</b>	Cleocin or <b>Clindacin</b> <b>Dalacin- I</b> <sup>(pharmacia)</sup>	Oint. ,lotion . solution
4	<b>Adopalene 0.1%</b>  <b>Ado. 0.1% +</b> <b>Benzo2.5%</b>	<b>Differin</b> <sup>(Galderma)</sup> <b>Sure-sure</b> <b>Epidua</b> <sup>(Galderma)</sup>	Cream , gel .
5	<b>Isotretinoin 0.1%,</b> <b>0.05% , 0.025%</b>	<b>Acretin –A</b> <b>Isotrex</b> <sup>(stiefet)</sup>	Gel , cream .

**Any extra notes:**

### Oral retinoid for acne

1-The retinoid isotretinoin reduces sebum secretion. **It is used for the systemic treatment of severe acne** <sup>(3)</sup>.

2- **Important** : The drug is **teratogenic** and must not be given to women of child-bearing age unless they practice effective contraception (see the product leaflets for the detailed of precaution regarding this point) <sup>(3)</sup>.

3-It is **given for at least 16 weeks**; repeat courses are not normally required <sup>(3)</sup>.

Scientific name	Trade names	Dosage form
<b>Isotretinoin</b>	<b>Roaccutane</b> <sup>(Roche)</sup> <b>Retane</b>	<b>Cap. 10 , 20 .</b>

### 12.12-Preparations for warts and calluses

1-Warts (verrucae) are caused by a human papillomavirus, which most frequently affects the hands, feet (plantar warts), and the anogenital region ; treatment usually **relies on local tissue destruction**.

2-Preparations of **salicylic acid (keratolytic)** are suitable for the removal of warts on hands and feet; it is also suitable for the removal of corns and calluses.

3- Paints and liquids contain salicylic acid, often in a **collodion-based vehicle**. Collodions contain a nitrocellulose derivative, dissolved in a volatile solvent such as ether, acetone or alcohol. On application, the solvent evaporates, leaving on the skin an adherent, flexible, water-repellent film containing the medicament. **This has the advantage of maintaining the salicylic acid at the site of application.**

4- **Note: do not let adjacent area of normal skin come in contact with drug.** If they do, wash off the solution immediately with soap and water .

5- The treatment is helped by **prior soaking of the affected hand or foot in warm water for 5–10 min** to soften and hydrate the skin, increasing the action of the salicylic acid.

6-**Note: Lactic acid** is included in some preparations with the aim of enhancing availability of the salicylic acid which may enhance the effects of salicylic acid. However, it appear that combination therapy **has no additional benefit over salicylic acid alone.**

7- **Salicylic acid plasters** : Corn and callus plasters contain high concentrations (usually 40%) .**They should be changed every 1–2 days** for about a week, after which the callosity should lift away easily.(حسب التعليمات المرفقة).

8-The treatment of **external anogenital warts** is by topical application of **Podophyllin**.

Preparations for warts and calluses			
	Scientific name	Trade names	Dosage form
1	S.A .+ lactic acid	Kalomark Duafilm <sup>(GSK)</sup>	Paint , gel , solution
2	Formaldehyde 0.75 %	Veracur <sup>(Typhorn)</sup>	Gel
3	Glutaraldehyde	Glutaral <sup>(Derm)</sup>	solution

**Any extra notes:**

## 12.13-Sunscreen preparations

1-The light from the UVA spectrum is responsible for skin tanning and UVB light causes sunburn. Sunburn is an inflammatory response to excessive exposure to ultraviolet which result in vasodilatation and increase capillary permeability.

2- The rays of the sun are the most direct and damaging **between 10 am and 3 pm**, therefore the customer should avoid sun exposure during this time of day as much as possible.

2- Sunscreen preparations contain **substances that protect the skin against UVA and UVB radiation.**

3- **The sun protection factor (SPF)** gives a rough estimate of the efficiency of the product to block UVB: For example , if a person normally show a signs of burning in 30 minutes without protection, then a product with a SPF of 6 would extend the period of time until burning begins to 3 hours (i.e.. it extends the time taken to burn by 6 times), and so on with SPF of 15 , 30, .... (However, in practice, users do not apply sufficient sunscreen product and the protection is lower than that found in experimental studies).

#### 4- Application:

A-Sunscreen must be **applied to all exposed areas of the body** including the nose ad lips (avoid contact with eye).

B-sunscreen should be reapplied as often as the product instruction leaflet directs (**Mostly every 2-3 hours**).

C-For most sunscreen product, they should **be applied 15 -30 minutes before sun exposure .**

Sunscreen preparations				
	Scientific name	Trade names	Dosage form	SPF
1	octinoxate 6%, enzacamene 4%, avobenzone 2%, oxybenzone 2%, ensulizole 2%, titanium dioxide 3% .	<b>Sunsense</b> (Ultracrawford)	<b>Lotion</b>	<b>50+</b>
2	avobenzone 5%, bisoctrizole 1.5%, octinoxate 7.5%, octocrilene 4%, titanium dioxide 5.2% .	<b>Uvistat</b> <sup>(CPC)</sup>	<b>Cream</b>	<b>30</b>

**Any extra notes:**

## 12.14-Androgenetic alopecia

1-**Finasteride (1mg tablet)** is licensed for the treatment of androgenetic alopecia in **men**. Continuous use for 3–**6 months** is required before benefit is seen, and effects are reversed 6–12 months after treatment is discontinued <sup>(3)</sup>.

### 2- Minoxidil

**A-**Topical application of minoxidil may stimulate limited hair growth in a small proportion of adults *but only for as long as it is used* <sup>(3)</sup>.

**B-** Minoxidil is available as 2% and 5% lotion: however, **women should not use the 5% product**, since it can cause hirsutism at other sites, such as the face, chest, ear rim, and back.

**C- Dose :** Apply **1mL twice daily** to dry hair and scalp <sup>(3)</sup>.

Preparations for androgenetic alopecia			
	Scientific name	Trade names	Dosage form
1	<b>Finasteride</b>	<b>Prostacare</b> <b>Propecia</b> <sup>(MSD)</sup>	<b>1mg tablet</b>
2	<b>Minoxidil</b>	<b>Regaine</b> <sup>(McNeil)</sup>	<b>2% and 5% lotion</b>

**Any extra notes:**

## 12.15-Antiperspirants

1-**Hyperhidrosis (excessive sweating)** can be generalized or focal, affecting the palms of the hands, soles of the feet, or axillae <sup>(2)</sup>.

2-Drug therapy should be tried initially but is often ineffective in severe cases. **Aluminium salts**, such as aluminium chloride or aluminium chlorohydrate in alcoholic solvents applied topically, may be successful in milder forms of focal hyperhidrosis <sup>(2)</sup>.

Antiperspirants (if available )			
	Scientific name	Trade names	Dosage form
1	<b>Al – Chlor. – hexa – hydrate20 %</b>	<b>Anhydrol</b> <sup>(Dermal)</sup>	solution

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3- BNF 61.