



النادي
MC
الطبي

Done By :
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لا تنسونا من دعائكم بالتوفيق

Q - لو أجبى (Case) بالإمتحانه وكانه بالإمتحانه أنه شخص

بدخنه لمدة طويلة مثلاً. سنة فالمرضه متعدي يكونه (Asthma)

Ph - 1

(كلام الدكتور)



Must know these

Ph - I

Pharmacological agents

MEDICATION	INDICATION	LONG-ACTING β_2 ADRENERGIC AGONIST/CORTICOSTEROID COMBINATION
SHORT-ACTING β_2 ADRENERGIC AGONISTS (SABAs)		Formoterol/budesonide SYMBICORT Asthma, COPD Formoterol/mometasone DULERA Asthma, COPD Salmeterol/fluticasone ADVAIR Asthma, COPD
Albuterol PROAIR, PROVENTIL, VENTOLIN Levalbuterol XOPENEX	Asthma, COPD Asthma, COPD	
LONG-ACTING β_2 ADRENERGIC AGONISTS (LABAs)		SHORT-ACTING ANTICHOLINERGIC
Formoterol FORADIL, PERFORMIST	Asthma, COPD	Ipratropium ATROVENT Allergic rhinitis, Asthma, COPD
Olodaterol STRIVERDI RESPIMAT Salmeterol SEREVENT	COPD Asthma, COPD	SHORT-ACTING β_2 AGONIST/SHORT-ACTING ANTICHOLINERGIC COMBINATION
		Albuterol/ipratropium COMBIVENT RESPIMAT, DUONEB COPD
INHALED CORTICOSTEROIDS		LONG-ACTING ANTICHOLINERGIC (LAMA)
Budesonide PULMICORT, RHINOCORT*	Allergic rhinitis, Asthma, COPD	Glycopyrrolate SEEBRI NEOHALER COPD Tiotropium SPIRIVA Asthma, COPD
Fluticasone FLONASE*, FLOVENT Mometasone ASMANEX, NASONEX*	Allergic rhinitis, Asthma, COPD Allergic rhinitis, Asthma	LABA/LAMA COMBINATION
		Formoterol/glycopyrrolate BEVESPI AEROSPHERE COPD Olodaterol/tiotropium STOLTO RESPIMAT COPD

أصفر
الرعي عليهم ما بلا عن
احفظوا

كلهم للasthama + copd
إلا اللي عليهم نجمة للcopd بس

OTHER AGENTS	INDICATION
Roflumilast DALIRESP Theophylline ELIXOPHYLLIN, THEO-24	COPD Asthma, COPD

يعني لو أجي سؤال بده دواءها بشتغل
لل(Asthma) وكانه واحد بالخيار =

مداوله أو واحد منهم فيكونه هو الجواب

11
أفهم الكل مما يليه بشتغل (نظرا على) COPD ماعنى



لازم تعرف short / long



ph - 1

SABAs (Short-Acting Beta Agonists)	LABAs (Long-Acting Beta Agonists)	ICS (Inhaled Corticosteroids)	LABAs+ICS	SAMA (Short-Acting Muscarinic Antagonist)	SABA/SAMA	LAMA (Long-Acting Muscarinic Antagonists)	LABA/LAMA	others
Albuterol	Salmeterol	Fluticasone	Salmeterol/Fluticasone	Ipratropium	Albuterol/Ipratropium	Glycopyrrolate	Formoterol/Glycopyrrolate	Roflumilast
Levalbuterol	Formoterol	Budesonide	Formoterol/Budesonide			Tiotropium	Olodaterol/Tiotropium	Theophylline
	Olodaterol	Mometasone	Formoterol/Mometasone					



Pharmacological agents:

β 2-adrenergic agonists

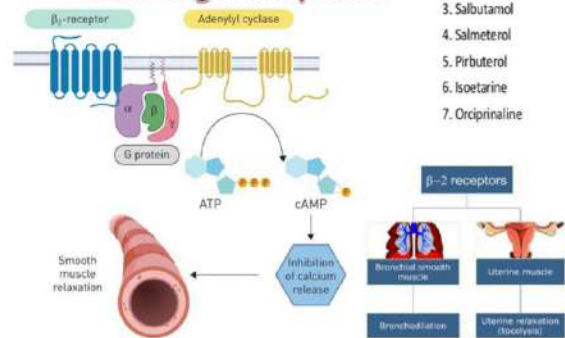
Ph-1

اعرفي انواع ال (receptor) وميز بظلم وعين بتدل

➤ **MOA:** You need to know the steps بالترتيب

Receptor activation (G protein (Gs) + adenylyl cyclase) >> increases intracellular cAMP >> activate protein kinase A (PKA) >> reduce intracellular Ca^{2+} or decrease the sensitivity of Ca^{2+} >> inhibition of myosin light chain phosphorylation (MLCK) >> preventing airway smooth muscle contraction.

Selective agonists of beta adrenergic receptors 2



1. Terbutaline
2. Clenbuterol
3. Salbutamol
4. Salmeterol
5. Pirbuterol
6. Isoetarine
7. Orciprinaline

➤ **Anti-inflammatory effects?**

reducing intercellular adhesion molecule-1 (ICAM-1)

reducing granulocyte-macrophage colony-stimulating factors (GM-CSF) release

برضو مهم



Pharmacological agents:

شو بيساوي؟
يشغلو عكس ال muscarinic

muscarinic antagonist (muscarinic receptor antagonist

(MRA): All drugs here will try to dayloid the bronchi

✓ Muscarinic receptors are predominately present on glandular cells, smooth muscle cells, and cardiac muscle cells.

✓ Competitively inhibit the effect of **acetylcholine (ACh)** at muscarinic receptors (M1 and M3)

✓ M1: CNS

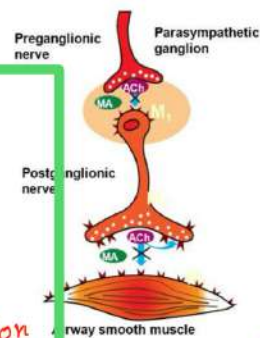
✓ M3: smooth muscle GI, UT, **airway**, and blood vessels

مهم نعرف انو ال m3 موجود بال GI/UT/airways
↳ Bronchodilation

✓ Side effects: dry mouth, constipation and urinary retention

These drugs will block the (M3) to prevent airway smooth muscle contraction

Mechanism of action of muscarinic antagonists



- Muscarinic antagonists block M₁ and M₃ receptors, thus preventing binding of acetylcholine and inhibiting airway smooth muscle contraction

ACh, acetylcholine; M, muscarinic receptor; MA, muscarinic antagonist

Ph-1



Pharmacological agents: Other agents

Ph-1



- **Roflumilast**
- **NOT** a bronchodilator and is **NOT** indicated for the relief of acute bronchospasm, it decreases inflammation in lungs
- Used in treating those with chronic bronchitis and a history of exacerbations.
- Use is limited by common adverse effects including **weight loss, nausea, diarrhea, and headache.** used with caution in those suffering from **depression.** Or mental issue

VIP

→ to allow the mucous to exist

- Cough medicines are not recommended. Beta blockers are not contraindicated for those with COPD and should only be used where there is concomitant cardiovascular disease

احتمال كبير تيجي هاي الفقرة بالامتحان

Ph-1
الدكتور قال ممكن يوصي سوائل منه لهونه



عززة العزرة

اللي محدد هو المهم

تفاد ريغ النادي الطبي
المشتركة



Treatment plans

هون مريض مع COPD

اللي بهمني انو اقيم كم مره صار عنده moderate exacerbations او كم مره دخل المستشفى

Table 1: mMRC dyspnea scale

Grade	Description of breathlessness
0	I only get breathless with strenuous exercise
1	I get short of breath when hurrying on level ground or walking up a slight hill
2	On level ground, I walk slower than people of the same age because of breathlessness or have to stop for breath when walking my own pace
3	I stop for breath after walking about 100 yards or after a few minutes on level ground
4	I am too breathless to leave the house or I am breathless when dressing

New diagnosis of COPD*

- Recommended general and preventative care for all patients:
- Avoidance of smoking and other risk factors
 - Influenza, pneumococcal, and COVID-19 vaccinations
 - Regular physical activity
 - Short-acting bronchodilator as needed for acute dyspnea (refer to below for selection)
 - Regular review of correct inhaler technique
 - Assessment of hypoxemia and hypercarbia for long-term oxygen and/or noninvasive ventilation

Has the patient had 2 or more moderate exacerbations OR at least 1 hospitalization for COPD exacerbation in the past year?

ph-1

ملاحظة:
الدكتور
سألني عن
عمل هذا
السلايه
عمدة مرات
بمطرات مختلفة

إذا ما عنده فهو قروب AB

Quantify dyspnea and symptoms using the mMRC dyspnea scale (refer to Table 1) and CAT. Does the patient have mMRC ≥ 2 or CAT ≥ 10 ?

مهم تعرف اسم
الفحصين و قيمتهم

GOLD Group A

GOLD Group B

GOLD Group E

the most severe

Does the patient have high peripheral eosinophil levels ($\geq 300/\mu\text{molL}$) OR Hospitalization for COPD exacerbation?

هون بصير زي B

بدنا corticosteroids

LAMA plus as-needed SABA (preferred) OR LABA plus SAMA-SABA or SABA^o OR As-needed SAMA-SABA or SABA⁵

LAMA-LABA dual bronchodilator therapy AND SABA as needed for acute dyspnea

LAMA-LABA dual bronchodilator therapy AND SABA as needed for acute dyspnea

ICS-LAMA-LABA therapy AND SABA as needed for acute dyspnea

عندنا كاتنوا تحت
the most imp

Allergies : Asthma

Smoking : COPD

Ph-2

Exam
cases



Ph-2

Agents used for Asthma: β2-adrenergic agonists

Receptor activation (G protein (Gs) + adenylyl cyclase) >> increases intracellular cAMP >> activate protein kinase A (PKA) >> phosphorylate Gq-coupled receptors >> reduce intracellular Ca²⁺ or decrease the sensitivity of Ca²⁺ >> inhibition of myosin light chain phosphorylation (MLCK) >> preventing airway smooth muscle contraction.

- MOA: COPD lecture

(1/2/3) by set جرد (AE) ال

- Adverse effects: tachycardia, hyperglycemia, hypokalemia, hypomagnesemia, and skeletal muscle tremors

KEY POINTS

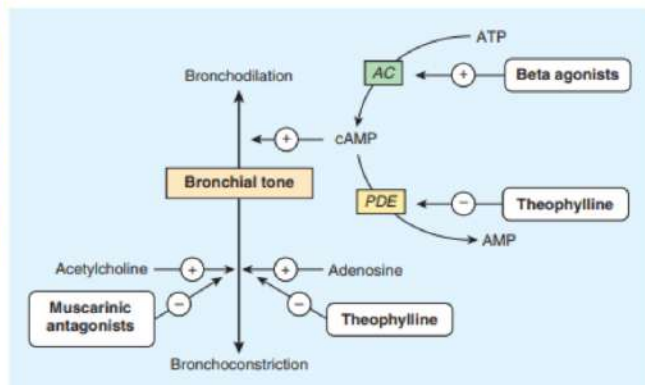
- Side effects:
- Tremor
 - Tachycardia (palpitations)
 - Nervousness
 - Cough
 - Hyperglycemia
 - Hypokalemia

depends on the dose

"off-target" effects on beta-1 receptors at high doses can lead to these side effects

Due to intracellular shift of K⁺

from COPD lecture



ضروري نعرف انه Oral CS او IV ممنوع استخدمهم ب كورسات طويلة و فترات طويلة و السبب هو انه side effect تبعثهم خطيرة و ممكن تعمل disregulation في الهرمونات

مفهوم الير تحتهم خط

Agents used for Asthma: Inhaled corticosteroids (ICS)

INHALED CORTICOSTEROIDS	
Beclomethasone BECONASE AQ [®] , QVAR	Allergic rhinitis, Asthma, COPD
Budesonide PULMICORT, RHINO-CORT [®]	Allergic rhinitis, Asthma, COPD
Ciclesonide ALVESCO, OMNARIS [®] , ZETONAX [®]	Allergic rhinitis, Asthma
Fluticasone FLOANAS [®] , FLOVENT	Allergic rhinitis, Asthma, COPD
Mometasone ASMANEX, NASONEX [®]	Allergic rhinitis, Asthma
Triamcinolone NASACORT [®]	Allergic rhinitis, Asthma

Routes of administration

I. Inhalation → long term use, ↓ side effects.

This formula has markedly reduced the need for systemic corticosteroid (less side effects) but appropriate inhalation technique is critical to the success of therapy

II. Oral/systemic → Short term use, Severe

Patients with a severe exacerbation of asthma may require IV methylprednisolone or oral prednisone to reduce airway inflammation.

In most cases, suppression of the hypothalamic-pituitary-adrenal cortex axis does not occur during the oral prednisone "burst" (short course) typically prescribed for an asthma exacerbation. Thus, a dose taper is unnecessary prior to discontinuation.

Inhaled vs. Oral Corticosteroids



Inhaled

- Treatment for persistent asthma
- Intended for long-term use
- Fewer and less severe effects such as headache, sore throat, common cold or flu, and muscle aches



Oral

- Treatment for severe asthma and/or attacks
- Intended for short-term usage
- More severe, diverse side effects such as nausea, acne, weight gain, and irregular heartbeat



Ph-2

الانذار حكي؟ لو جيت سؤال، و العلاج حيكونى شهر، هل بنختار Oral او inhaled؟

انجيد inhaled.

توقف عن محور القصبي

Ph - 2

Keep in mind that ICS are highly effective for long-term management, but they are not used to treat acute asthma exacerbations.



Agents used for Asthma: Alternative drugs

Ph-3

- Useful for treatment of asthma in patients who are poorly controlled by conventional therapy or experience adverse effects secondary to corticosteroid treatment.
- Should be used in conjunction ^{جناطی جنب} with ICS therapy for most patients.
- A. **Leukotriene ((LT) modifiers** (Zileuton, Zafirlukast, montelukast)
- B. **Cromolyn** NOT a bronchodilator>> NOT useful in managing an acute asthma attack.
- C. **Cholinergic antagonists** (ipratropium and Tiotropium)
- D. **Theophylline**
- E. **Monoclonal antibodies** (Omalizumab, mepolizumab, benralizumab and reslizumab)



Ph-3

Agents used for Asthma: Leukotriene modifiers

الأحبة له أعراضه جانبية

Dyspepsia

مثل عسر الهضم



➤ **LTB4** and the cysteinyl leukotrienes (**LTC4, LTD4, and LTE4**) are **products of the 5-lipoxygenase pathway** of arachidonic acid metabolism and part of the inflammatory cascade.

عليه سؤال بالإمتحان لا تضيقوا علامته احفظوا

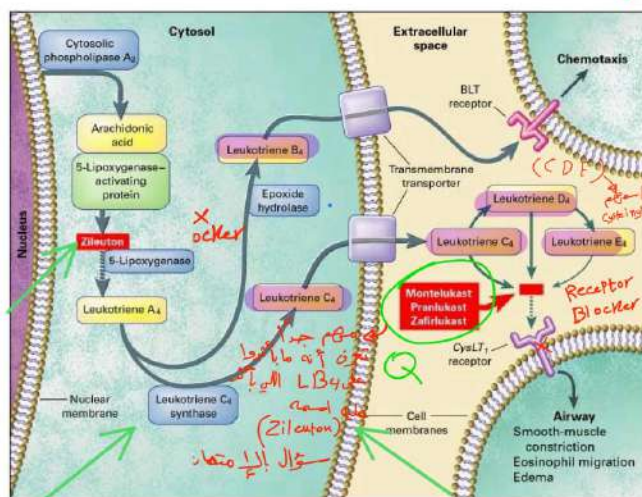
➤ 5-Lipoxygenase is found in cells of **myeloid** origin, such as mast cells, basophils, eosinophils, and neutrophils.

we want to stop the process from the start
هنا يستعمل جدول الdrugs في حالة الattack ؟ لا
لانو أصلا بهمني انو الbronchospasm اللي عندي أوسعه
بهمنش هنا أوقفها من فوق

أدوية
الذراع
أيش
بسوا

➤ **LTB4** is a potent chemoattractant for **neutrophils** and **monocytes**, stimulates production of proinflammatory cytokines.

➤ **cysteinyl leukotrienes constrict** bronchiolar smooth muscle, **increase** endothelial permeability, **promote** mucus secretion, eosinophil recruitment and airway remodeling in chronic asthma



هنا إذا اجا سؤال بالامتحان و كان فيه صيغة attack ما بتستخدم جدول (leukotriene modifiers)

إذا فيه bronchodilator مثل saba لازم تفكر بالbronchodilator ما دام عندك attack بهم اتعامل مع الattack بعدين مع الmaintenance

Ph-3

- **Omalizumab** Bind to IgE

(Receptor on Mast and Baso cells) يمنع ارتباطها بال

فيمنع خروج ال (Mediators)

- **Mepolizumab**
- **Benralizumab**
- **Reslizumab**)

Bind to IL-5 ×

Antagonist



Asthma classification

Guidelines for asthma
 مهم نعرف شو ال step و شو الأدوية لكل step
 مهم الجدول (كله مهم)



Asthma symptoms/lung function	Therapy*
<p>Step 1 لازم كلهم يكونو موجودات عشان نسميهم step 1</p> <p>All of the following:</p> <ul style="list-style-type: none"> Daytime symptoms ≤ 2 days/week Nocturnal awakenings ≤ 2/month Normal FEV₁ Exacerbations ≤ 1/year 	<ul style="list-style-type: none"> SABA, as needed or Low-dose ICS-formoterol as needed (preferred)⁴ LABA
<p>هون لازم وحده تكون موجوده</p> <p>Step 2</p> <p>Any of the following:</p> <ul style="list-style-type: none"> Daytime symptoms >2 but <7 days/week Nocturnal awakenings up to <u>3 to 4</u> nights/month Minor interference with activities Exacerbations ≥ 2/year 	<ul style="list-style-type: none"> Low-dose ICS daily and SABA as needed or Low-dose ICS-formoterol as needed (preferred) <p>Alternative option(s)</p> <ul style="list-style-type: none"> Daily LTRA and SABA as needed

مهم لأشياء (cases)

<p>Step 3</p> <p>Any of the following:</p> <ul style="list-style-type: none"> Daily symptoms Nocturnal awakenings >1/week Daily need for reliever Some activity limitation FEV₁ 60 to 80% predicted Exacerbations ≥ 2/year 	<ul style="list-style-type: none"> Low-dose ICS-formoterol as maintenance and reliever therapy^o (preferred) or Low-dose ICS-LABA combination daily and SABA as needed <p>Alternative option(s)</p> <ul style="list-style-type: none"> Medium-dose ICS daily and SABA as needed
<p>Step 4</p> <p>Any of the following:</p> <ul style="list-style-type: none"> Symptoms all day <u>كل ليلة</u> Nocturnal awakenings <u>nightly</u> <u>تو</u> Need for SABA several times/day Extreme limitation in activity FEV₁ $<60\%$ predicted Exacerbations ≥ 2/year An acute exacerbation 	<ul style="list-style-type: none"> Medium-dose ICS-formoterol as maintenance and reliever therapy^o (preferred) or Medium dose ICS-LABA daily and SABA <u>not needed</u> <p>Alternative option(s)</p> <ul style="list-style-type: none"> Medium-dose ICS daily plus anti-leukotriene and SABA as needed^o

حنبداً نحكي عن ال treatment , تذكروا انه هداول مو للعلاج الكتمل بل هم للحماية و التخفيف من الاعراض



Pharmacological treatments

Note that these drugs are specific for Allergic rhinitis

1. **Intranasal corticosteroids** → *Most effective*

2. **Antihistamines** → *Main drug*

3. α -Adrenergic agonists

4. Cromolyn and leukotriene receptor antagonists

ANTIHISTAMINES (H ₁ -RECEPTOR ANTAGONISTS)	
Azelastine ASTELIN [®] , ASTEROP [®]	Allergic rhinitis
Cetirizine ZYRTEC	Allergic rhinitis
Desloratadine CLARINEX	Allergic rhinitis
Fexofenadine ALLEGRA	Allergic rhinitis
Loratadine CLARITIN	Allergic rhinitis
α -ADRENERGIC AGONISTS	
Oxymetazoline AFRIN, DRYSTAN	Allergic rhinitis
Phenylephrine NEOSYPHINE, SUDAFED PE	Allergic rhinitis
Pseudoephedrine SUDAFED	Allergic rhinitis
AGENTS FOR COUGH	

less used.

****The most effective drugs are corticosteroids that are given intranasally not by inhalation**



Sensitization is a process by which the immune system will produce the IgE antibody in response to certain types of particles or allergens it considered abnormal

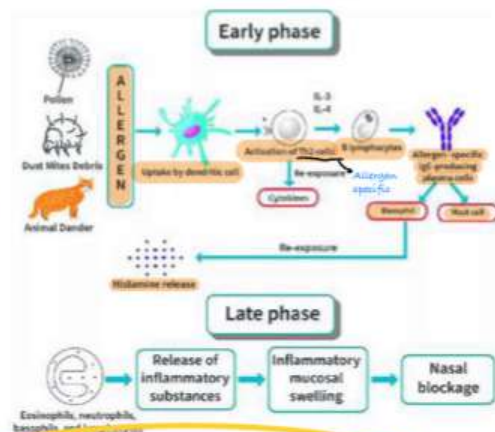
Pathophysiology

It is type 1 hypersensitivity



- First exposure to allergens (no symptoms) (Sensitization)
- DCs take up the allergen, process it present it to naive T cells which will activate and differentiate them into allergen-specific type 2 T helper cells (T_H2 cells) >> induce the activation of B cells >> plasma cells will produce allergen-specific IgE that binds to mast cells and basophils
- The mast cells release mediators, such as histamine, leukotrienes, and chemotactic factors that promote bronchiolar spasm and mucosal thickening from edema and cellular infiltration.

Dendritic Cells



PH-4

اللي بهم الدكتور بهاد السلايد انه نكون عارفين انواع ال mediated cell لانه

اكيد الادوية بتستهدفهم (ممكن يجي عليهم سؤال)

تفرغ جبهة دمك

Histamine effects

- Histamine is present in all tissues
- High concentrations in mast cells and basophils
- Functions as a neurotransmitter in the brain
- Released by allergies, anaphylaxis and as a result of destruction of cells (cold, toxins from organisms, venoms from insects and spiders, and trauma)
- H1 receptor: smooth muscle contraction and increasing capillary permeability
- Can enhance the secretion of proinflammatory cytokines

شايقين شو الهستامين بيعمل ؟؟ ال anti-histamine بيعمل عكسه

H₁ Receptors

EXOCRINE EXCRETION
Increased production of nasal and bronchial mucus, resulting in respiratory symptoms.

BRONCHIAL SMOOTH MUSCLE
Constriction of bronchioles results in symptoms of asthma and decreased lung capacity.

INTESTINAL SMOOTH MUSCLE
Constriction results in intestinal cramps and diarrhea.

SENSORY NERVE ENDINGS
Causes itching and pain.



Ph - 4

Congestion ~> corticosteroid ~> no response or incomplete control
~> antihistamines with decongestants

Corticosteroid is the first treatment for congestion

مفادات الاحتقان

مهمة

Case

• Combinations of antihistamines with decongestants are effective when congestion is a feature of rhinitis, when patients have no response or incomplete control of symptoms with intranasal corticosteroids.

Anti histamines

Ph - 4

المعلومة جدا جدا مهمة

ملاحظة كمان مهمة و هي انه احنا ما بنستعمل ال Histamine بحالة وجود attack بل بنستعملهم لحالات ال prevention ، مثال انا بعرف انه عندي حساسية و طالعة
يمكن فيه شجر لازم اوخد anti-histamine

useful in treatment of symptoms caused by histamine (not caused by inflammatory process)

تفريخ يعود و جبرينة

Pharmacological treatments: Antihistamines

PH-4

• First generation:

1. Diphenhydramine
2. Chlorpheniramine

} Most Sedation

DC

• Internasal and/or eye drops:

2. Azelastine

↑
مرضا
علم
فوق

• Second generation: → Can't cross B.B.B

1. Fexofenadine
2. Loratadine
3. Cetirizine

} Least sedation

→ partial sedation

FLC

Sedation ال
مهمة جدًا وأكيد
عليها سؤال

* the first line treatment of chronic rhinitis is corticosteroids

@ **BBC FM Tried** to explain inhaled corticosteroids to asthma patients.

B: Budesonide

B: Beclomethasone

C: Ciclesonide

F: Fluticasone

M: Mometasone

Tried: Triamcinolone

ph-4

هدول الطريقة
لحفظ الانوية



معلومة للإمتحان، الدكتور حكى انه ال corticosteroid الي اخدناهم بالاربع
محاضرات حيجي عليهم سؤال بيجمع ما بين المحاضرات

Ph-4

تم حضره من السوق لأنه يعتبر نوع من المنشطات
(يزيد اليقظة والتركيز) ويستخدم في تحضير نوع من
أنواع المخدرات (حل مكانه phenylephrin pseudoephedrine)

α -Adrenergic agonists:

example :- Phenylephrine

Phenylephrine
Oxymetazoline
pseudoephedrine

very every used

useful if they have congestion

Pharmacological treatments: nasal decongestants

- Short-acting **constrict dilated arterioles** in the nasal mucosa and **reduce airway resistance**.
- **Rapid onset** of action and show few systemic effects.
- **Not recommended as monotherapy** → usually they come mixed with antihistamines
- Oral forms has been linked to **increased blood pressure, heart rate and insomnia**
- **Effects of phenylephrine appear similar to those of placebo!!**

ببدا بواحد وبعدين ببدل بيناتهم

Ph - 4

انتبه للعمر في الامتحان

Pharmacological treatments

Mild or episodic symptoms:

مفيد اذا انتك كنت عايش في مكان فيه كثير allergens واحنا مش دائماً
رح نقدر نحدد allergen الي بيعمل المشكلة

1. Oral antihistamine (cetirizine (≥ 6 months), fexofenadine or loratadine):
regularly or as needed (two to eight hours before exposure)

اذا صار attack

او اذا كنت عارف انك رايح على مكان فيه allergens

يعطى لعمر فوق السنين

2. nasal spray antihistamine: azelastine > 6 years of age

Corticosteroid

3. nasal spray glucocorticoid (more effective than antihistamines):
regularly or as needed (initiating therapy two days before, continuing
through, and for two days after the end of exposure): Mometasone,

fluticasone or triamcinolone

4. nasal spray Cromolyn

Q
Most use because it has very
excellent safety profile (preferred
because it's most safe drug)

Given as
protective
prophylactic
medicine (اذا
كنت عارف انك
رايح على مكان فيه
allergens)

Treatment of Cough

Ph-4



AGENTS FOR COUGH	
1 Benzonatate TESSALON PERLES	Cough suppressant ^{→ Dry cough}
2 Codeine (with guaifenesin) VARIOUS	Cough suppressant/expectorant
3 Dextromethorphan VARIOUS	Cough suppressant ^{→ wet cough}
4 Dextromethorphan (with guaifenesin) VARIOUS	Cough suppressant/expectorant
5 Guaifenesin VARIOUS	Expectorant

2 + 4 → Combination

- ICS: the drug of choice for long-term control in patients with persistence asthma
- LABA: in Asthma treatment shouldn't be used ~~only~~ as a monotherapy, used only in combination with an asthma controller medication such as an inhaled corticosteroids
- Antihistamines Drugs: is the drug of choice in controlling the symptoms of allergic rhinitis.
- Corticosteroid is the first treatment for Congestion

Corticosteroids is the first line treatment of chronic rhinitis

α -Adrenergic agonists ~~&~~ in treatment of congestion not recommended as monotherapy.

... (Drug of choice) ...

بالتوفيق