وَقُل رَّبِّ زِدْنِي عِلْمًا

النادي الطبي

RESPIRATORY SYSTEM

HAYAT BATCH

SUBJECT : Pharmacology

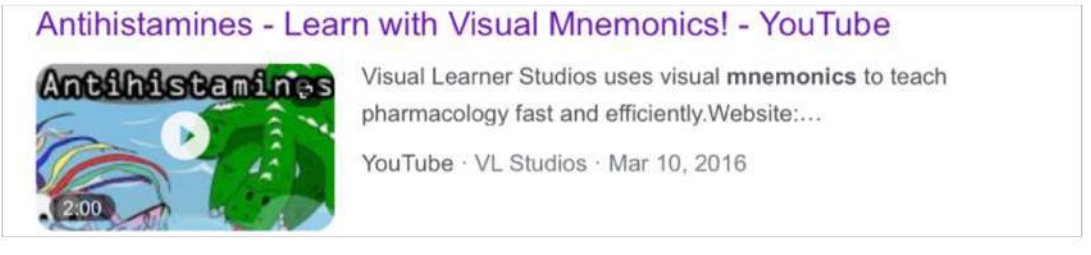
LEC NO. : 4

DONE BY : Mahmoud & Johainah

Lecture 4: Treatment of allergic rhinitis (AR) and cough

Respiratory system
Second year
Medical school
Hashemite University
2nd semester 22/23
Sofian Al Shboul, MD, PhD.

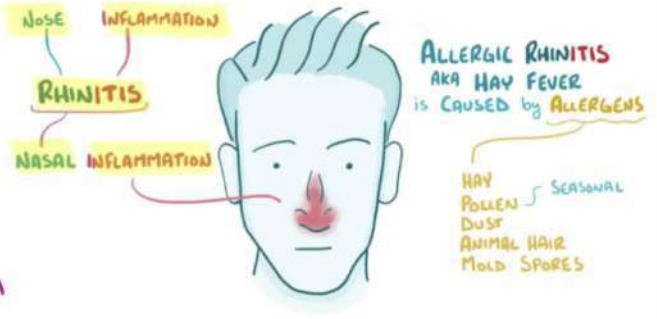
محاضرة اليوم سهلة و لطيفة كثير 🔥 حأترك الكم اي مصدر رجعت اله و خصوصا الفيديوهات 👏🏻 و كمان ضفت فقرات الكتاب الي مو مكتوبة للاحتياط



Allergic rhinitis (AR)

- An **inflammation** of the mucous membranes of the **nose** and is characterized by:

1. Sneezing عطس
2. itchy nose/eyes حكة بالأنف أو العين
3. watery rhinorrhea سيلان الأنف
4. nasal congestion/itching احتقان الأنف
5. sometimes a nonproductive cough.



A non-productive cough, also known as a dry cough, refers to a cough that does not produce sputum

Definition & symptoms

Allergic rhinitis =Allergies +symptoms focused within the nose area

- Caused by immunoglobulin E (IgE)-mediated reactions to inhaled allergens (over-reaction of the immune system)
- It is often co-morbid with asthma and/or conjunctivitis. مرض مشترك
  لأنه الهم نفس
  Pathophysiology
- 20 to 40 years old

الاشخاص الي معهم allergic rhinitis بكون معهم كمان حساسية مع او او التهاب بال conjunctiva بالعين و ليس العكس

و ما في الها treatment و chronic، فكل الادوية بتعالج symptoms و ليس cause; السبب انها بتكون مرتبطة بجينات مهمة كثير (immune related) و ما بقدر اعمل الها inhibition مثل

IL33 - IL33R - IL13

Risk factors & triggers

- Known as "hay fever"

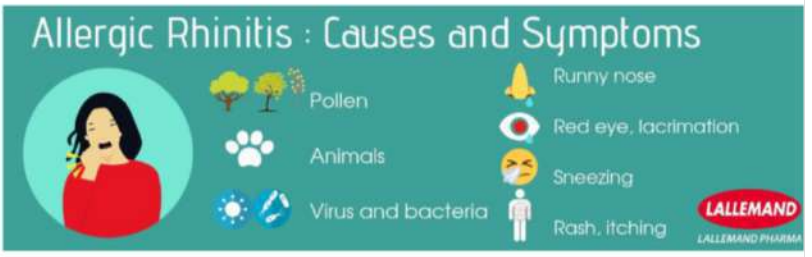
القش و الشعير

- An attack may be precipitated by inhalation of an allergen (such as dust, pollen, or animal dander).

عبار — نقاح — وبر الحيوانات

- Genetic factors: IL33, IL33R and IL13.

Immune related genes



an Al Shboul ©

The Allergy flare up at a specific time of the year

ال MET office هو مكتب للارصاد الجوية موجود في بيريطانيا بصدر هاد ال Pallon Calendar و بيحكيلي انه كل شهر كيف وضع الجو، لحتى الناس الي عندهم allergic rhinitis و asthma
يكونوا عارفين متى بناسبهم يروحوا عالحدائق

- 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

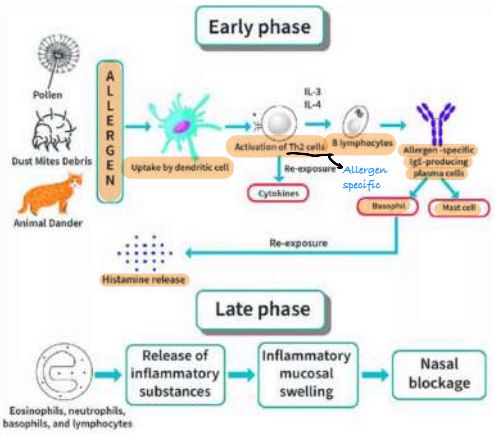
Pathophysiology

It is type 1 hypersensitivity

- First exposure to allergens (no symptoms) (Sensitization)

Dendritic Cells

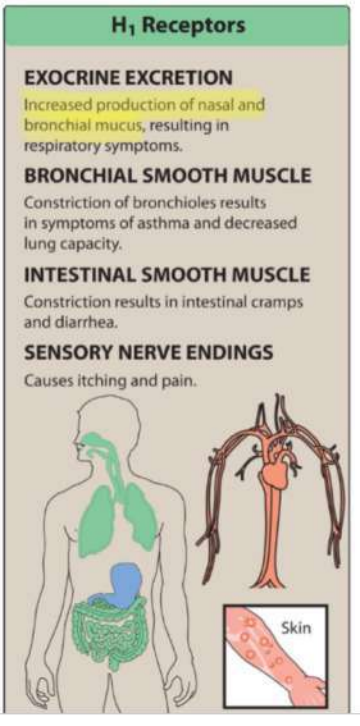
- DCs take up the allergen, process it present it to naive T cells which will activate and differentiate them into allergen-specific type 2 T helper cells (T_H2 cells) >> induce the activation of B cells >> plasma cells will produce allergen-specific IgE that binds to mast cells and basophils
- The mast cells release mediators, such as histamine, leukotrienes, and chemotactic factors that promote bronchiolar spasm and mucosal thickening from edema and cellular infiltration.



الي بهم الدكتور بهاد السلايد انه نكون عارفين انواع الmediated cell لانه اكيد الادوية بتستهدفهم (ممكن يجي عليهم سؤال)

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



شايفين شو الهستامين بيعمل ؟؟ الanti-histamine بيعمل عكسه

There are 4 types of Histamine Receptors :

H1: it is the main target of clinically use of drugs, it is expressed on vascular epithelium, smooth muscle cells, brain and peripheral nerve ending.

H2

H3

H4

حنبدأ نحكي عن ال treatment , تذكروا انه هدول 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

less used.

ANTIHISTAMINES (H_1-RECEPTOR ANTAGONISTS)	
Azelastine ASTELIN®, ASTEPRO®	Allergic rhinitis
Cetirizine ZYRTEC	Allergic rhinitis
Desloratadine CLARINEX	Allergic rhinitis
Fexofenadine ALLEGRA	Allergic rhinitis
Loratadine CLARITIN	Allergic rhinitis
α-ADRENERGIC AGONISTS	
Oxymetazoline AFRIN, DRISTAN	Allergic rhinitis
Phenylephrine NEOSYNEPHRINE, SUDAFED PE	Allergic rhinitis
Pseudoephedrine SUDAFED	Allergic rhinitis
AGENTS FOR COUGH	

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

إحساسي والله

السلايد مهمة أكيد عليها سؤال

Pharmacological treatments:

② Antihistamines

Block the H1 receptor ~> prevent action of histamine

- Oral antihistamines (H1 receptor antagonists) have a **fast onset of action** and are useful for the **management of symptoms** of allergic rhinitis caused by **histamine release**, such as sneezing, watery rhinorrhea, and itchy eyes/nose.

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

- However, they are more effective for **prevention** of symptoms **in mild or intermittent** disease.

rather than treatment once symptoms have begun.

- Drugs of choice in controlling the symptoms of allergic rhinitis

***When we say Oral drug = slow onset usually + systemic effect**
IV drug = rapid onset usually

***Oral antihistamines have a fast onset of action**
حتحكولي شو هالتناقض حأحكيلكم مقارنة مع الoral drug التانيين هم يعتبروا سريعين و بشتغلوا خلال ساعات

and are useful for the management of symptoms of allergic rhinitis caused by histamine release.
في عنا شرط مهم لحتى تشتغل ادوية ال (anti-histamine) و هو انه يكون في histamine release
المعلومة جدا جدا مهمة

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

اما بحالة وجود attack، فبعطي corticosteroids

ال Anti-histamine اله 2generations ، الاول بطلنا نستعمله الثاني مستعمل

Pharmacological treatments: Antihistamines

- Ophthalmic and nasal antihistamine delivery devices are available for targeted, topical tissue delivery.
- ~~Suitable for patients with mild cases or ocular symptoms.~~

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

Corticosteroid is the first treatment for congestion

مفيدة

مفادات الاحتقان

- Combinations of antihistamines with decongestants are effective when (1) **congestion is a feature of rhinitis**, or (2) when patients have **no response or incomplete control of symptoms with intranasal corticosteroids**.

*Ophthalmic antihistamines and decongestants may be used for the treatment of hay fever, allergic reactions, and red eyes not caused by a bacterial infection.They reduce mucus formation and redness.

*Examples of topical intranasal antihistamines include olopatadine and azelastine.

*Intranasal antihistamines provide increased delivery of the drug with fewer adverse effects.

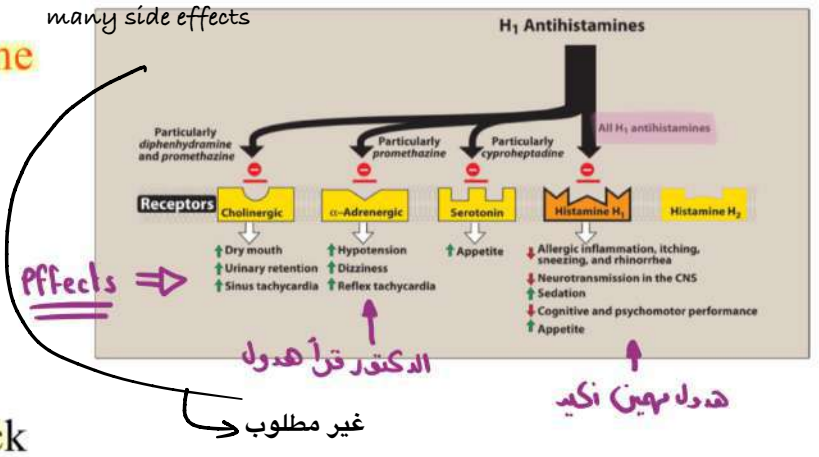
Pharmacological treatments: Antihistamines (Actions)

- They do **not influence** the formation or release of histamine

H1 receptor

- They **block the receptor-mediated** response of a target tissue.
- They can bind to cholinergic, adrenergic, or serotonin receptors>> additional effects unrelated to their ability to block H1 receptors.

Not specific for H1 reception so it have many side effects



*The mechanism of action is believed to be a competitive antagonism of histamine binding to cellular receptors.

*It binds to H1receptor .

*It can also binds to cholinergic, alpha-adregenic and serotonin receptors and causes adverse effects

Pharmacological treatments: Antihistamines (Pharmacokinetics)

- Well absorbed after oral administration>>maximum serum levels occurring at 1-2 hours.
- First-generation half-life is 4 to 6 hours (faster)
- Second-generation half-life is 12 to 24 hours (once-daily dosing)
- First-generation distributed in all tissues (CNS) → They can cross the B.B.B, so they are not used nowadays
  - So we go to use second generation
- Metabolized by the liver By Cyt P450

Pharmacological treatments: Antihistamines (Adverse effects)

- First-generation have a low specificity, interacting with histamine muscarinic cholinergic, α-adrenergic, and serotonin receptors:

1. Sedation تخدير
2. Tachycardia
3. Hypotension
4. Vertigo دوار
5. Increased appetite

فقط هذول المهمات
ال side effects في الصفحة السابقة غير مطلوبة

*antihistamines that make you feel sleepy (most sedation) : chlorphenamine (Piriton), and diphenhydramine.

*non-drowsy antihistamines that are less likely to make you feel sleepy – such as acrivastine, cetirizine, fexofenadine and loratadine.

Pharmacological treatments: Antihistamines

- First generation:
  1. Diphenhydramine
  2. Chlorpheniramine

} Most Sedation

- Internasal and/or eye drops:
  1. ~~Olopatadine~~
  2. Azelastine

شرحنا عنهم فوق

- Second generation: → Can't Cross B.B.B
  1. Fexofenadine
  2. Loratadine

Least sedation

  3. Cetirizine
  4. ~~Levocetirizine~~

partial sedation

Sedation الـ مهمة جدًا وأكيد عليها سؤال

**There are 2 generations for anti-histamine:

*First-generation antihistamines, such as diphenhydramine and chlorpheniramine, are usually not preferred due to adverse effects, such as sedation, per-formance impairment, and other anticholinergic effects.

*The second-generation antihistamines (for example, fexofenadine, loratadine, desloratadine, cetirizine) are generally better tolerated.

Antihistamines - Learn with Visual Mnemonics! - YouTube

Visual Learner Studios uses visual **mnemonics** to teach pharmacology fast and efficiently.Website:…

YouTube · VL Studios · Mar 10, 2016

4 key moments in this video

هاد الفديو عاليوتيوب بعطيكم طرق لحفظ الأدوية

مهمة

Pharmacological treatments:

1 Corticosteroids

INHALED CORTICOSTEROIDS	
Beclomethasone BECONASE AQ*, QVAR	Allergic rhinitis, Asthma, COPD
Budesonide PULMICORT, RHINOCORT*	Allergic rhinitis, Asthma, COPD
Ciclesonide ALVESCO, OMNARIS*, ZETONNA*	Allergic rhinitis, Asthma
Fluticasone FLONASE*, FLOVENT	Allergic rhinitis, Asthma, COPD
Mometasone ASMANEX, NASONEX*	Allergic rhinitis, Asthma
Triamcinolone NASACORT*	Allergic rhinitis, Asthma
Ipratropium ATROVENT	Allergic rhinitis, Asthma, COPD

- **Nasal CS are the most effective medications for treatment of allergic rhinitis.** → Because it's key for fight of inflammation (histamine release is a part of inflammatory process)
- Onset of action that ranges from **3 to 36 hours** after first dose
- improve sneezing, itching, rhinorrhea, and nasal congestion.
- Systemic absorption is minimal, and adverse effects of treatment are localized (nasal irritation, nosebleed, sore throat, and, rarely, candidiasis)
- Patients should be instructed تعليمات to **avoid deep** inhalation during administration into the nose, why? To minimize systemic absorption, The target tissue is the nose → To reduce its side effects
- For patients with chronic rhinitis, improvement may not be seen until 1 to 2 weeks after starting therapy.

***Intranasal corticosteroids examples: becomethasone, budesonide, fluticasone, cicesonide, mometasone, and triamcinolone.**

***To minimize systemic absorption, patients should be instructed to avoid deep inhalation during administration into the nose, because the target tissue is the nose, not the lungs or the throat. {local corticosteroids}**

***Remember that the systemic corticosteroid are given orally or intramusculary**

*** 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

معلومة للإمتحان، الدكتور حكى انه الcorticosteroid الي اخدناهم بالاربع محاضرات حييجي عليهم سؤال بيجمع ما بين المحاضرات

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

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!!

nausea. غثيان

a-Adrenergic agonists:

*Intranasal drugs.

*oxymetazoline ->Longer-acting. *phenylephrin ->Short-acting

*intranasal formulations of a-adrenergic agonists should be used for no longer than 3 days due to the risk of rebound nasal congestion (rhinitis medicamentosa).
For this reason, the a-adrenergic agents are not used in the long-term

Intranasal

Pharmacological treatments: Other agents

- **Cromolyn:** For prophylaxis
  - regularly or as needed (ideally 30 minutes before an exposure).
  - helpful for brief exposures (minutes to hours).
  - For prolonged exposures: begin four to seven days in advance
  - Has very excellent safety profile
- **Leukotriene receptor antagonists may be a reasonable option in patients who also have asthma.** only.

rhinorrhea associated with allergic rhinitis or the common cold. It does not relieve sneezing or nasal congestion.

لـ العطس — احتقان الانف لـ

Other Agents :

1-Intranasal cromolyn:

الهدف من استعمالهم هو prevention لهيك بعطيهم قبل التعرض للallergen, و لحتى احصل على optimize effect لازم احصل عالdose قبل اسبوع او اسبوعين من التعرض للallergen و استخدمه عدة مرات يومياً

2-leukotriene receptor antagonists

هدول أدوية بتستهدف *receptors* اسمهم leukotriene receptors و هدول عبارة عن mediators لل inflamation و allergic diseases

لهيك احنا بنستخدم الAntagonists لنوقف عملهم بحالات الasthma

They are effective for allergic rhinitis as monotherapy or in combination with other agents.

3-ipratropium

Intranasal drug

بستخدمه لعلاج ال rhinorrhea الي اله علاقة بال common cold او allergic rhinitis

ولكن هو ما بخفف من شغلتين :

1- sneezing. 2- nasal congestion

ببدأ بواحد وبعدين ببدل بيناتهم

انتبه للعمر في الامتحان

Pharmacological treatments

Mild or episodic symptoms:

مفيد اذا انته كنت عايش في مكان فيه كثير allergens واحنا مش دائمًا 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)

يعطى لعمر فوق السنتين

او اذا كنت عارف انك رايح على مكان فيه allergens

اذا صار attack

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

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

4. **nasal spray Cromolyn**

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

Pharmacological treatments

You start with corticosteroid then you add

Persistent or moderate-to-severe symptoms

1. Nasal sprays glucocorticoid
2. Addition of an antihistamine spray
3. OR Addition of a minimally sedating oral antihistamine

Lecture 4: Treatment of allergic rhinitis (AR) and cough

Respiratory system
Second year
Medical school
Hashemite University
2nd semester 22/23
Sofian Al Shboul, MD, PhD.

المهم بهاد الموضوع هو اسماء الادوية و كيف نتعامل معها

*Coughing is an important defense mechanism of the respiratory system in response to irritants and is a common reason for patients to seek medical care.

*A troublesome (مزعجة) cough may represent several etiologies, such as the common cold, sinusitis, or an underlying chronic respiratory disease.

*In some cases, cough may be an effective defense reflex against an underlying bacterial infection and should not be suppressed.

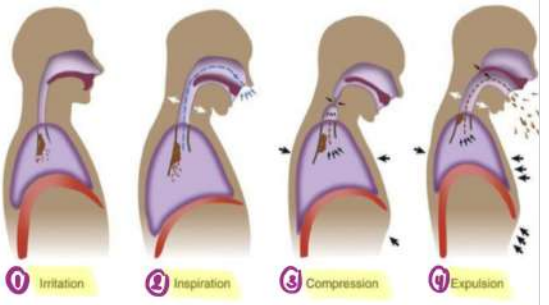
طبعاً مابعيس أوقفط بهاي الحالة

Before treating cough, identification of its cause is important to ensure that antitussive treatment is appropriate. The priority should always be to treat the underlying cause of cough when possible.

Cough is a major Involuntary protective reflex
Within few seconds

Overview

- A sudden expulsion of air through the large breathing passages that can help clear them of fluids, irritants, foreign particles and microbes.
  - طرد
  - مهيجات
- Not to be suppress- Indiscriminately
  - Without know the reason
  - لا يتم قمعها بشكل عشوائي
- Many situations do not serve any purpose
- Disturb patient ,its rest and sleep
  - قد تزعج المرضى اثناء النوم او الراحة لهيك أنا بعالجها



ال cough عبارة عن normal process و انا ما بعالجها الا لما تزعل المريض، مثلا المريض ما بيعرف ينام بسببها او بستفرغ

Cough

- Productivity
  - Productive
  - Non-Productive
- Severity
  - acute
  - Chronic

↓

هي الي بعالجها وبتقيم بها

Types and common causes of cough

Give treatment to stop it ← We need to suppress it

- Non-productive (dry): No useful purpose, increases discomfort to the patient >> needs suppression

بتعامل معها بشكل أساسي

- Productive (tenacious): Presence of excessive sputum >> suppression not desired >> needs coughing/clearing out of the sputum

We need to keep it

Clinical cough descriptor	Definition
Acute	Cough that lasts for < 3 weeks
Subacute	Cough that lasts 3 – 8 weeks
Chronic	Cough that lasts > 8 weeks
Refractory	Cough that does not respond to usual medical treatment such as the ADP
Chronic idiopathic	Cough with no underlying cause even after a thorough systematic review
Specific	A known underlying disease causing the cough

ADP: Anatomical diagnostic protocol.

Complications of coughing

- Acute:

1. cough syncope (fainting spells due to decreased blood flow to the brain when coughs are prolonged and forceful), (اغماء — نوبات اغماء)
2. Insomnia (أرق)
3. Cough-induced vomiting,
4. Subconjunctival hemorrhage or "red eye"

Chronic: (توضيح)

1. Abdominal or pelvic hernias

A perineal hernia occurs when weak pelvic floor muscles allow part of an organ or tissue to push into your abdominal cavity.

2. Fatigue fractures of lower ribs and costochondritis.
3. Chronic or violent coughing can contribute to damage to the pelvic floor and a possible cystocele.

(complications حسب ال) مش دائمًا بخليها ممكن اوقفها

Acute cough -> when it lasts fewer than three weeks.
Chronic cough -> when it lasts more than eight weeks.

Treatment

AGENTS FOR COUGH	
1 Benzonatate TESSALON PERLES	Cough suppressant
2 Codeine (with guaifenesin) VARIOUS	Cough suppressant/expectorant
3 Dextromethorphan VARIOUS	Cough suppressant
4 Dextromethorphan (with guaifenesin) VARIOUS	Cough suppressant/expectorant
5 Guaifenesin VARIOUS	Expectorant

2 + 4 → Combination

- Before treating cough, identification of its cause is important to ensure that antitussive treatment is appropriate.

علاج الكحة بحكوله

- Priority should always be to treat the underlying cause of cough when possible.

There are 2 types of OTC cough medicines

Anti-tussive (cough suppressant)

* inhibit Cough
* ↓ Reflex of cough
* used to treat dry Cough with little mucus present.
* Side effect :-
  1. Dizzness
  2. fatigue
  3. nausea
  4. Constipation

Expectorants

* easy to cough mucus
* ↑ amount of water present in mucus
* used to treat wet Cough with Lots mucus present.
* Side effect :-
  1. Dizzness
  2. fatigue
  3. nausea
  4. Vomiting

مهمة

- **Antitussives:**

Used when cough performs no useful function (i.e. is nonproductive), and its complications represent a real or potential hazard (i.e. distressing, painful, increasing airway damage or causing morbidity)

- **Expectorants:**

Used to get rid of excessive thick bronchial secretions

Table comparing
Cough Suppressant & Expectorant

Characteristics	Cough Suppressant	Expectorant
Definition	A medication that inhibits or suppresses a cough	A medication that makes it easier to cough up mucus
Ingredients	Dextromethorphan is the suppressant but often the medicine also has codeine and diphenhydramine	Guaifenesin is the expectorant but sometimes bromhexine and salbutamol are also added
Activity	Greatly reduces the reflex to cough	Increases the amount of water present in mucus so it can be coughed up
Uses	Used to treat coughs that are dry, with little mucus present	Used to treat coughs that are wet, with lots of mucus present
Side effects	Dizziness, fatigue, nausea, and constipation	Dizziness, fatigue, nausea, and vomiting

DB Difference Between.net

المهم نعرف انه في فرق بين النوعين، و مرات بعطيهم ب combination .

Antitussives

❖Centrally acting: مثال

1- Opioid mechanism: Codeine → حنحكي عنه

2- Non opioid mechanism: dextromethorphan → حنحكي عنه

❖Peripherally acting

1- Pharyngeal demulcent: Lozenges or Glycerine.

2- Steam inhalation

*Central antitussive drugs act within the CNS at the level of the brain stem, where the basic neural circuitry responsible for cough is located

*Peripheral antitussive drugs act outside the central nervous system (CNS) to inhibit cough by suppressing the responsiveness of one or more vagal sensory receptors that produce cough

Guaifenesin

- an **expectorant**, is available as a **single-ingredient formulation** and is commonly found in **combination cough products** with codeine or dextromethorphan.

لحتى ما يزيد **mucus secretion** لدرجة كبيرة (يعني مثلاً يمكن يعمل **choking**)

- ↑ Bronchial secretion, ↓ Viscosity

- ~~Side effects: dizziness, sleepiness, skin rash, and nausea.~~

*Guaifenesin is currently the only expectorant approved

*Expectorant: a medicine which promotes the secretion of sputum by the air passages, used to treat coughs.

AGENTS FOR COUGH	
Benzonatate TESSALON PERLES	Cough suppressant
Codeine (with guaifenesin) VARIOUS	Cough suppressant/expectorant
Dextromethorphan VARIOUS	Cough suppressant
Dextromethorphan (with guaifenesin) VARIOUS	Cough suppressant/expectorant
Guaifenesin VARIOUS	Expectorant

على قصة الcombination هاد الجدول بوضح مع مين بعطه
و الجدول مهم 🫶

اعذروني اعدت
ترتيب ال 3 صفحات

Codeine +anopioid

1
✓Decreases the sensitivity of cough centers in CNS to peripheral stimuli 2 **and** decreases mucosal secretion.

✓Doses to get these effects are lower than those required for analgesia.

✓Adverse effects: constipation, dysphoria, and fatigue.

✓**Codeine has addictive potential** → إدمان

Codeine is an opiate and prodrug of morphine mainly used to treat pain, coughing, and diarrhea.
ما بستعمله بسبب مشكلة الادمان و الside effects
The addictive potential effect of Codein limits its use, given increasing concerns with opioid addiction in the United States

Dextromethorphan

Synthetic derivative of morphine with NO analgesic effects in antitussive doses.

❖Better adverse effect profile than does codeine **and** is equally effective for cough suppression. Better than the codeine
لأنه بيعطي نفس التأثير بس ما اله نفس التأثير من ناحية ال **addictive profile**

❖In low doses = low addictive profile.

❖It is also a potential drug of abuse, since it may cause **dysphoria at high doses.** ← اضطراب الهوية، شعور الضيق الجنسية

❖Can trigger a histamine release (allergic reaction) >> children susceptible to allergic reactions should be administered dextromethorphan only if absolutely necessary

❖AE: Nausea, vomiting

استعمالهم مفضل اكثر من codaine
بيعملوا ادمان بس اخف

Quiz Time ⏳

1-Histamine plays an important role in initiating the body's immune response to the presence of foreign antigens & pathogens. A primary source of histamine released during inflammatory conditions are:
A- B cells
B- Enterochromaffin-like cells
C- Presynaptic nerve terminals
D- Mast cells
E- T lymphocytes
Answer : D

2-Use of this class of over-the-counter drugs has been associated with poor academic performance in children, an increased incidence of automobile accidents, increased work injuries & a significant decline in cognitive function in the elderly. A commonly used member of this drug class is:
A- diphenhydramine
B- fexofenadine
C- loratadine
D- nizatidine
Answer : A, first generation drug

3-A 24 year-old patient presents on a bright sunny Spring morning with a constellation of signs & symptoms that include a stuffy runny nose, sneezing, red, itchy & watery eyes, and a cough related to postnasal drip. A diagnosis of allergic rhinitis is made. In addition to a decongestant or corticosteroid spray, what other medication could you recommend that would counteract the effects related to histamine release, but have the least impact on mental status?
A- brompheniramine
B- chlorpehniramine
C- diphenhydramine
D- fexofexadine
E- ranitidine
Answer : D

6- Mr Thibidoux arrives in your ER after suffering a gun-shot wound in a bar fight. After taking a brief history and exam, you decide to rapidly reduce his severe pain by administering i.v. morphine. Shortly thereafter Mr Thibidoux complains of feeling nauseous and itchy, and you notice that the skin on his neck & chest have become severly pink, when they were previously pale white. Which of the following would best reduce all of these symptoms if administered?
A- adrenaline
B- cimetidine
C- cromolyn sodium
D- diphenhydramine
E- loratadine
Answer : D

5- Which is not a second generation antihistamine
a) Cyclizine
b) Fexofenadine
c) Loaratidine
d) Acrivastine
Answer : A

6- Which agent is a preferred antihistamine for the man- agement of allergic rhinitis?
A. Chlorpheniramine
B. Diphenhydramine
C. Phenylephrine
D. Cetirizine
Answer : D

7- Which category of allergic rhinitis medications is most likely to be associated with rhinitis medicamentosa (rebound nasal congestion) with prolonged use?
A. Intranasal corticosteroid
B. Intranasal decongestant
C. Leukotriene antagonist
D. Oral antihistamine
Answer: B

8- A 24-year-old woman presents to her primary care physician complaining of feeling sleepy all the time. She has a history of hay fever since the age of 9 years. She is currently taking an antihistamine but cannot remember the name. She says it controls her hay fever symptoms well. You suspect that her medication is causing her to feel sleepy. First generation antihistamines can cause drowsiness because they cross the blood–brain barrier and act on which receptor?
(A) H1
(B) H2
(C) H3
(D) H4
Answer : A

9- A 42-year-old man with HIV disease is hospitalized for refractory fungemia. He has begun on a course of caspofungin. After administration of the first intravenous dose, the patient develops flushing and sweats. What is the most likely mechanism of action for this finding?
(A) Histamine release from mast cells
(B) Pancreatic pseudocyst
(C) Parathyroid adenoma
(D) Parathyroid hyperplasia
(E) Pheochromocytoma
Answer : A

10-A 27-year-old medical student has recurrent sinusitis and takes an over-the-counter agent. Unfortunately, he fell asleep while taking his final examination of the anatomy course. Which of the following agents is most likely to cause this adverse effect?
(A) Doxycycline
(B) Doxylamine
(C) Doxazosin
(D) Diphenhydramine
(E) Hydroxyzine
Answer: D

11- A 15-year-old female presents to her primary care physician complaining of runny nose and itchy eyes. She said that she first had these symptoms during the spring a few years ago, but each year, they have been bothering her more. You know there are multiple ways to interfere with the signaling that is causing her symptoms. Which of the following drugs would prevent the release of the main chemical mediator in her case?
(A) Cromolyn sodium
(B) Diphenhydramine
(C) Ranitidine
(D) Loratadine
(E) Theophylline
Answer : A

12- A 6-year-old boy is brought to his primary care physician with a history of hay fever and asthma. He usually has two to three attacks per week. For symptom control, he uses an albuterol inhaler, but his parents would like to try something more. They would like him to take something that would lessen the amount of attacks he has. Although corticosteroids would probably work best for prophylaxis, they are contraindicated in children. He is instead given montelukast. How does montelukast works?
(A) Blocks leukotriene receptors
(B) Blocks muscarinic acetylcholine receptors
(C) Inhibits COX-1 and COX-2
(D) Inhibits COX-2 only
(E) Inhibits lipoxygenase
Answer: A