

وَقَالَ رَبِّ زِدْنِي عِلْمًا



RESPIRATORY SYSTEM

HAYAT BATCH



Phama

SUBJECT : _____

LEC NO. : _____ *Lec 4*

DONE BY : _____ *Mass*

تقاريف المادة

RS-Pharmacology notes

YouTube Videos

اضغط على الكلام المكتوب باللون الأزرق لتنتقل مباشرة الى المحاضرة

ملاحظة: يوجد تقاطع كبير بين ادوية الربو و ادوية COPD

و اغلب المصادر بتشرح الربو اول لهيك رح احط فيديوهات من شرح الربو تستفيدو منها دراستكم لل COPD

الموضوع	الفيديوهات المطلوبة 1	الفيديوهات المطلوبة 2	الفيديوهات المطلوبة 3
Treatment of COPD lec 1	احضر هذا الفيديو كامل رح يشرح موضوع الربو و الCOPD الفيديو رهيب	للي يحب شرح فودة احضروا هذا الفيديو من الدقيقة 36 الى الساعة و 13 دقيقة اما اذا بتحضره كامل بتكون خلصت الربو يعني درست محاضرتين	

شرح عبدالمتعال فودة

FOUDA



I'm back 😎

المحاضره سهله بس شوي بدها ترتيب معلومات
يعني كل ما تخلص ٤ سلايدات راجع العنوانين
عشان ما تضيع و شكرا شكرا 🙏



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

Respiratory system
Second year
Medical school
Hashemite University
2nd semester 23/24
Sofian Al Shboul, MD, PhD.





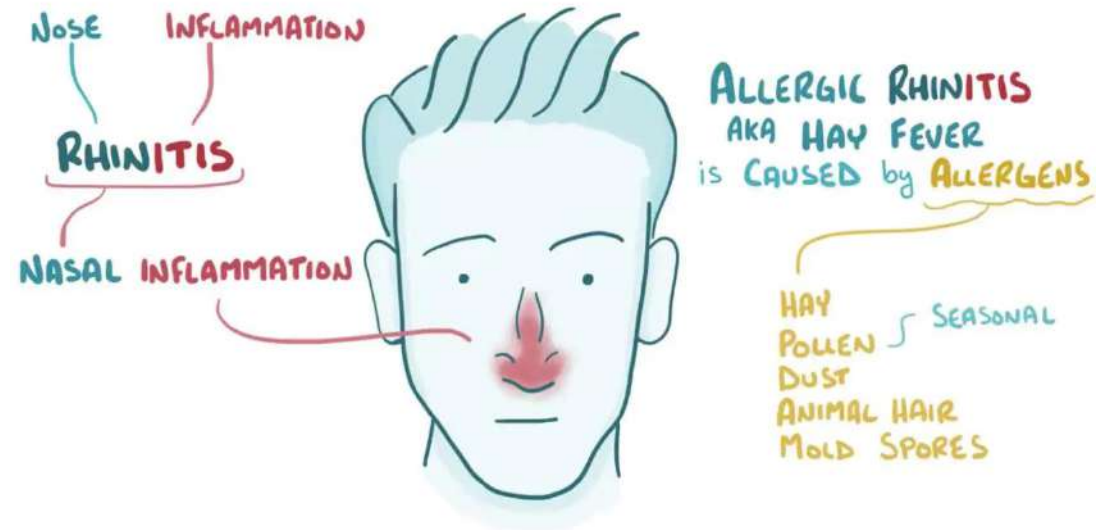
The pathophysiology of it is allergic reaction



Allergic rhinitis (AR) = allergy + inflammation

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

1. Sneezing
2. itchy nose/eyes
3. watery rhinorrhea
4. nasal congestion/itching
5. sometimes a nonproductive cough.





Definition & symptoms

اخذناه بال *asthma* اذا متذكّرين 🤔

بالسلايد الجاي شرحنا شوي عنها عشان ناسبين 🤔

اكيد مش متذكّرين عارفه 🤔

➤ 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. وليس العكس



Foreign materials (allergens) >> ↑ IgE (genetically determined) >> IgE antibodies bind to mast cells in the airway mucosa
بتعمل الحساسية و اعراضها
ال *asthma* ما الله علاقه ولا شوي بال *asthma*؟

Allergic rhinitis and asthma

If you have asthma, not treating your allergic rhinitis or hay fever symptoms adequately can lead to worsening of symptoms and increases the risk of a sudden asthma attack.

90% of people with asthma have allergic rhinitis



30% approximately of people with asthma have undiagnosed allergic rhinitis

لانه الهم نفس ال *pathophysiology*

Treating allergic rhinitis symptoms in people with asthma has been shown to reduce asthma exacerbations and A&E visits by up to

80%



In allergic rhinitis, IgE (Immunoglobulin E) plays a significant role in triggering the allergic response. IgE is an antibody produced by the immune system in response to the presence of allergens, such as pollen, dust mites, or pet dander. When a person with allergic rhinitis comes into contact with an allergen, their immune system produces IgE specific to that allergen. These IgE antibodies then bind to mast cells and basophils, which are types of immune cells found in tissues throughout the body, including the nasal passages.



Risk factors & triggers

- Known as “hay fever”
- An attack may be precipitated by inhalation of an allergen (such as dust, pollen, or animal dander).
- Genetic factors: IL33, IL33R and IL13.

حكيها
فوق

Allergic Rhinitis : Causes and Symptoms

Causes:

- Pollen
- Animals
- Virus and bacteria

Symptoms:

- Runny nose
- Red eye, lacrimation
- Sneezing
- Rash, itching

LALLEMAND
LALLEMAND PHARMA





- 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

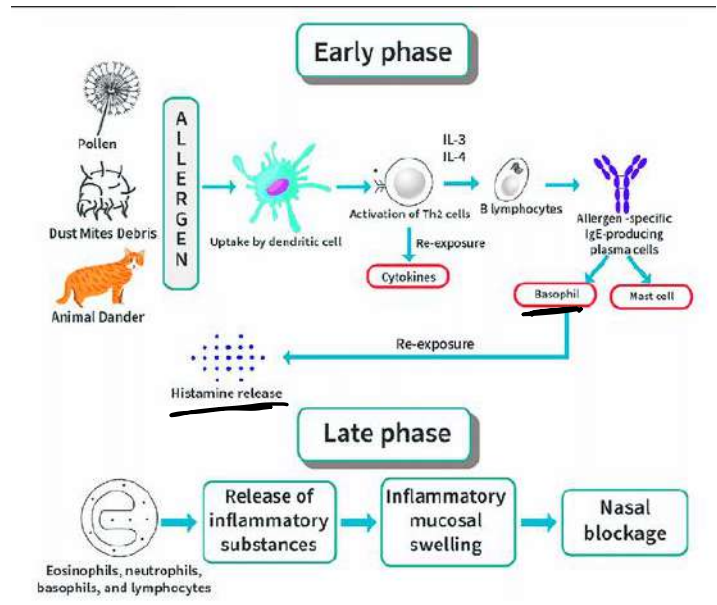
السلايد
مهممممممممم

التحسس الاول مافي اعراض لانه الجسم بيسل ما تعرف عليه
تاني تحسس بتبلش الاعراض و يشتغلو المضادات الحيوية يلي انتجتها اول مره وشكرا شكرا 😊

Pathophysiology

اسم التحسس الاول وهاي تعتبر
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.





كل هاي وظائف الهستامين
يعمى ال *antihistamines* بعمل العكس

اهم اشى اعرف من وين بطلع و ليش بطلع و شو
شغله و تاثيره على ال *inflammatory proses*

هدف الهستامين هو هاد المستقبل

الجدول مهم تقريبا كل السلايد
ملخص فيه



Histamine effects

و من ضمن هاي الانسجه ال
neurotransmitter in the brain

- Histamine is present in all tissues
- Higher 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**

بشكل اساسى بهاي الجالات

H₁ Receptors

EXOCRINE EXCRETION

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

BRONCHIAL SMOOTH MUSCLE

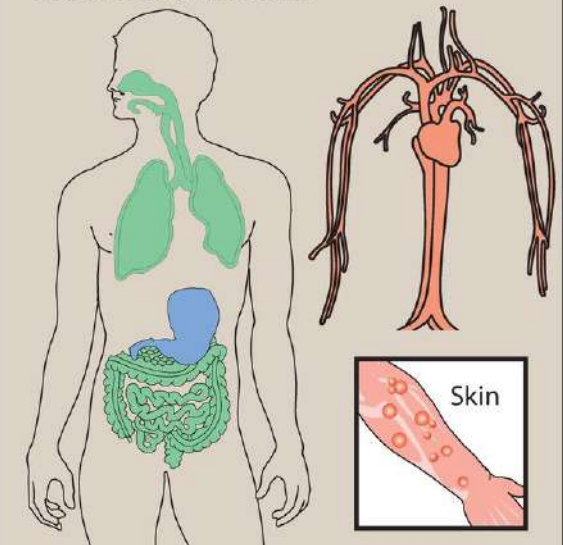
Constriction of bronchioles results in symptoms of asthma and decreased lung capacity.

INTESTINAL SMOOTH MUSCLE

Constriction results in intestinal cramps and diarrhea.

SENSORY NERVE ENDINGS

Causes itching and pain.





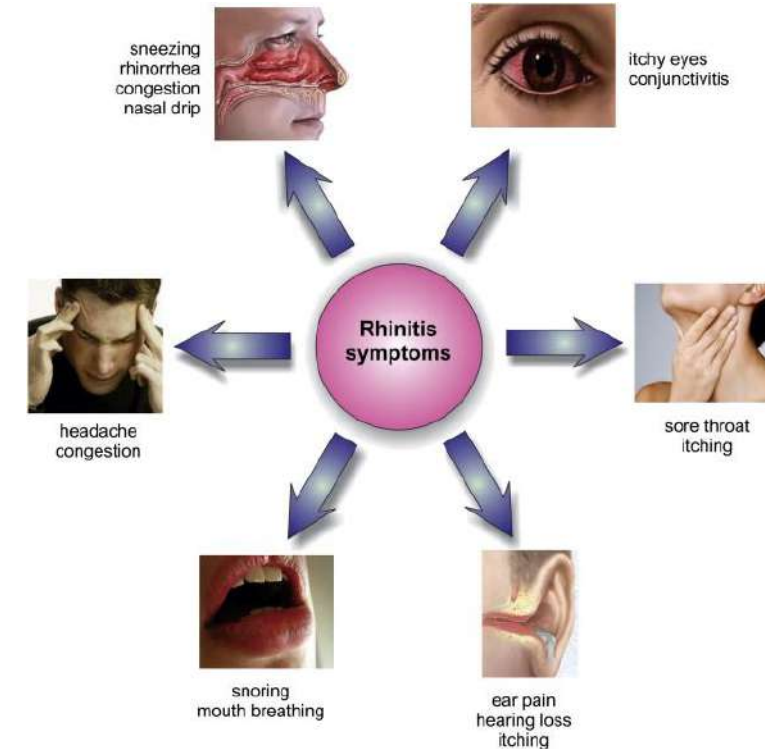
Pharmacological treatments

1. Intranasal corticosteroids *اول خيار*
Most effective
2. Antihistamines *Mean drug*
3. Nasal decongestant sprays
4. Cromolyn and leukotriene receptor antagonists



Pharmacological treatments: Antihistamines

- Oral antihistamines (H1 receptor antagonists) *Block in its function* *بتعمل* 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. *Not by inflammatory process*
- more effective for prevention of symptoms in mild or intermittent disease.





Pharmacological treatments: Antihistamines

- Ophthalmic and nasal antihistamine delivery devices are available for targeted, topical tissue delivery.

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

بجالتين يستخدمه
بس دائما اول خيار هو
corticosteroids



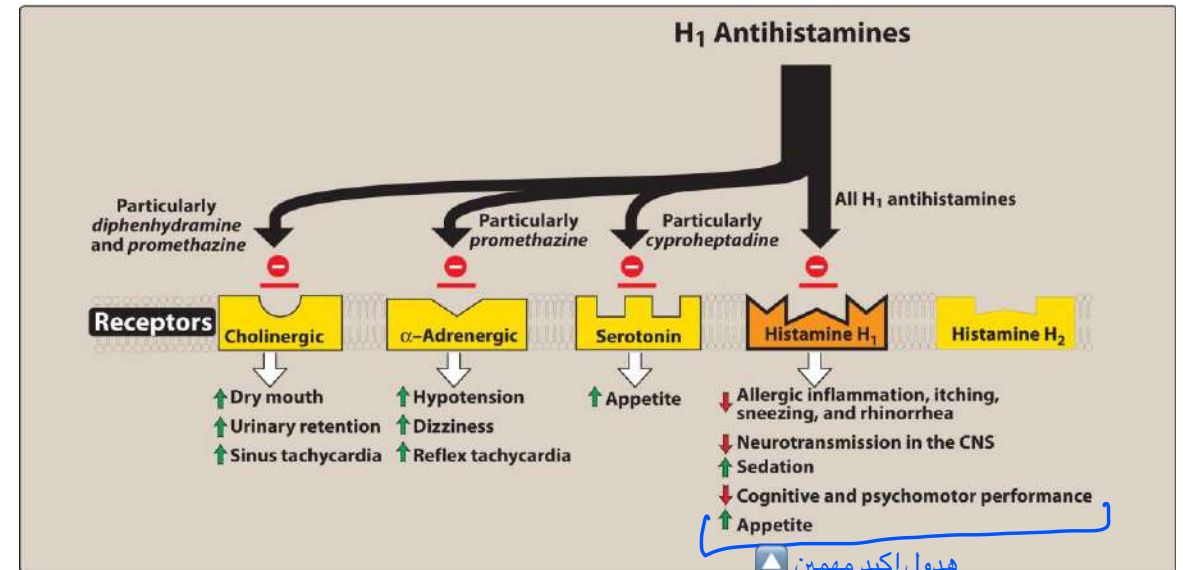


had mesh maddad *not specifically*
other *for HI* عادي يرتبط ب
receptors and that's mean in
the pharmacology side of view
is going to have more and
more side effects



Pharmacological treatments: Antihistamines (Actions)

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





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
- Second-generation half-life is 12 to 24 hours (once-daily dosing)
- First-generation distributed in all tissues (CNS) *Which causes a problems association with these*
- Metabolized by the liver





Pharmacological treatments:

Antihistamines (Adverse effects)

- First-generation have a low specificity, interacting with histamine muscarinic cholinergic, α -adrenergic, and serotonin receptors:
 1. Sedation
 2. Tachycardia
 3. Hypotension
 4. Vertigo
 5. Increased appetite



Pharmacological treatments: Antihistamines

- First generation:

1. Diphenhydramine
2. Chlorpheniramine

- Second generation:

1. Fexofenadine
2. Loratadine
3. Cetirizine

- Internasal and/or eye drops:

1. Azelastine



Pharmacological treatments: Corticosteroids

ال *side effects* الة اضعاف و
 اخطر من ال *side effect*
 للهستامين

Budesonide PULMICORT, RHINOCORT*	Allergic rhinitis, Asthma, COPD
Fluticasone FLONASE*, FLOVENT	Allergic rhinitis, Asthma, COPD
Mometasone ASMANEX, NASONEX*	Allergic rhinitis, Asthma
Triamcinolone NASACORT*	Allergic rhinitis, Asthma

- Nasal CS are the **most effective** medications for treatment of allergic rhinitis.

الفرق بين الهستامين و ال corticosteroids
 هو انه الهستامين جزء من ال allergic
 process بس ال corticosteroids is a

- Onset of action that ranges from **3 to 36 hours** after first dose
- Systemic absorption is minimal, and adverse effects of treatment are localized (nasal irritation, nosebleed, sore throat, and, rarely, candidiasis)

عشان ال *sides effects*

- Patients should be instructed to **avoid deep** inhalation during administration into the nose, why?

To minimize systemic absorption
 The target tissue is the nose



Phenylephrine
Oxymetazoline
pseudoephedrine
مفيدين اذا عنده
conjection

Pharmacological treatments: nasal decongestants

mixed with
بالعاده بيجو
antibistamine

مضادات الاحتقان

- 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**
- Oral forms has been **linked to increased blood pressure, heart rate and insomnia**
phenylephrine هسا بدنا نعرف انه ال
very similar to pseudoephedrine
- Effects of phenylephrine appear similar to those of placebo!!

هسا ال *pseudoephedrine* انسحب
من السوق لكثرة سوء استخدامه لانه
في ناس صارت توخذه كمنشط و هيك
ممنوع على الرياضيين فستبدلوه ب
phenylephrine



Pharmacological treatments: Other agents

- **Cromolyn:** *Preventive drug*
 - 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. ↵

لازم في *asthma* غير
هيك ما النافيه

Other Agents

: 1-Intranasal cromolyn:

الهدف من استعمالهم هو *prevention* لهيك بعطيهم قبل التعرض لل *allergen*, و
لحتى احصل على *optimize effect* لازم احصل عال *dose* قبل اسبوع او اسبوعين
من التعرض لل *allergen* و استخدمه عدة
مرات يومياً

2-leukotriene receptor antagonists

هدول أدوية بتستهدف *receptors* اسمهم *leukotriene receptors* و هدول
عبارة عن

mediators لل *inflammation* و *allergic diseases*

لهيك احنا بنستخدم ال *Antagonists* لنوقف عملهم بحالات ال *asthma*
*They are effective for allergic rhinitis as monotherapy or in
combination with other agent*





●●● اذا كان المريض *mild or episodic* و هو بالغ يعني *adult* بعطيه *nasal corticosteroids* *cause is most effective*

Pharmacological treatments

Mild or episodic symptoms:

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

اذا الطفل اقل من 6 اشهر بعطيه هاد الدواء

اما لو عمر الطفل فوق ال سنتين بعطي هدول

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

باخذها لامنع ال *allergic* انه

يصير

يعني باخذه ك *preventive*

proliferative medicine وهاي

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

مفعولها بتبلش هون

4. **nasal spray Cromolyn**

1. *Most use*

2. *The most safety drugs (very good in safety)*



Pharmacological treatments

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

nasal sprays هون بعطي
glucocorticoid و بعدين ببلش
اضيف عليه



Lecture 4: Treatment of cough

Respiratory system

Second year

Medical school

Hashemite University

2nd semester 23/24

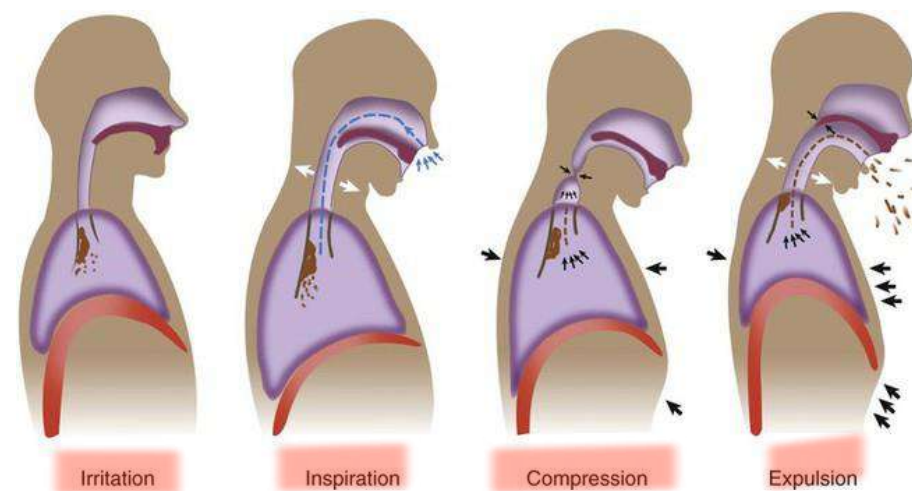
Sofian Al Shboul, MD, PhD.



Cough is a major Involuntary protective reflex

Overview

- ❖ A sudden expulsion of air through the large breathing passages that can help clear them of fluids, irritants, foreign particles and microbes.
- ❖ Not to be suppress- Indiscriminately
- ❖ Many situations do not serve any purpose
- ❖ Disturb patient ,its rest and sleep





Types and common causes of cough

هاي يلي بعالجها وبتعامل
معها بسرعه

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

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

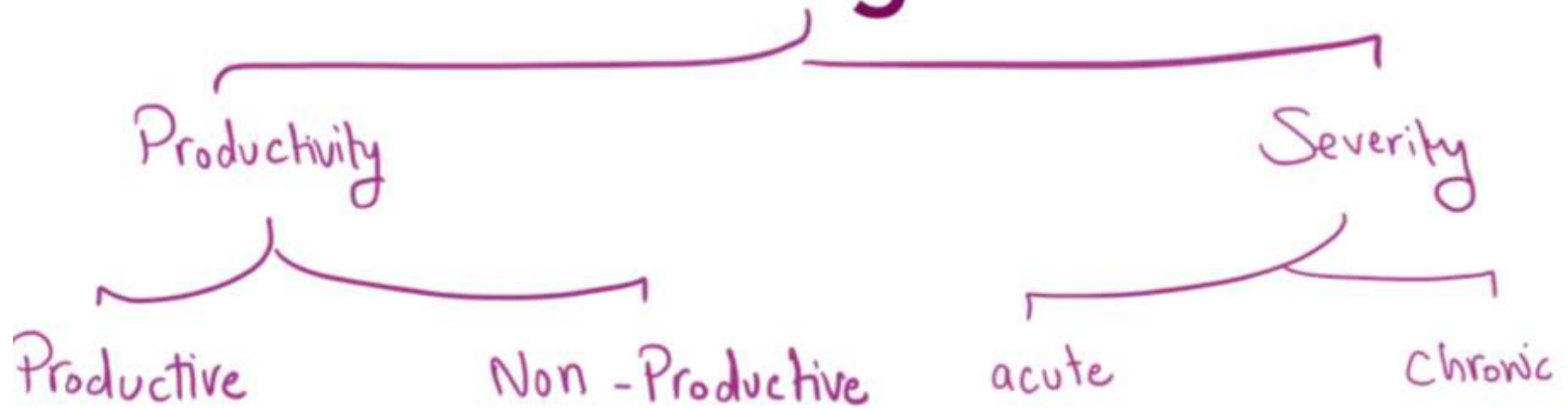
بِسْ هَدُول مِنَ الْجَدُول

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.



Cough



هذه الی باجر
و سببها



Acute cough → when it lasts fewer than three weeks.

Chronic cough → when it lasts more than eight weeks.

Complications of coughing

للاسف اه مهم تعرفو الاعراض
لانهم بيجو كيسيز 🥲



• Acute:

اغماء

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

• Chronic:

1. Abdominal or pelvic hernias
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.

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





Treatment

لازم احدد السبب لاتأكد اذا رح اعطي
دوا هون ولا لا

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

Not cough it self

نرجع نذكر انه اي دوا بعالج الاعراض
و ليس المرض نفسه



نصيحه الجدول سهل لا يفركم حجمه جربو هسا
اقرأوه المفردات سهله و بسرعه بتنحفظ هو جدول
لاميز بينهم في حال اجت حاله عنهم

Table comparing
Cough Suppressant
&
Expectorant

مطلوب حكا مهم

- Antitussives: مضادات التقشع

بستخدمه بهدول الحالتين

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: مقشعات

Used to get rid of excessive thick bronchial secretions

للتخلص من ال mucus

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



Guaifenesin

- an expectorant, is available as a single-ingredient formulation and is commonly found in combination cough products with codeine or dextromethorphan.
- ↑ Bronchial secretion, ↓ Viscosity



هانت خلصنا 😊

الفكره يا ستي انه

Guaifenesin is currently the only expectorant approved

**Expectorant: a medicine which promotes the secretion of sputum*

بس احيانا بحفزها زياده عن اللزوم و بزيد الطين
بله طيب و الحل ؟

الحل يا اخوي انه ندمجه مع اشئ ثاني يقلل
مفعوله للحد المعقول يعني بعمله *control*



Codeine

- ✓ Decreases the sensitivity of cough centers in CNS to peripheral stimuli **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**



استعمالهم مفضل اكثر من *codaine*

بيعملوا ادمان بس اخف

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.
- ❖ In low doses = low addictive profile.
- ❖ It is also a potential drug of abuse, since it may cause **dysphoria at high doses**.
- ❖ Can trigger a histamine release (allergic reaction) >> children susceptible to allergic reactions should be administered dextromethorphan only if absolutely necessary
- ❖ AE: Nausea, vomiting

رح نراجع موضوع صغير عشان نوضح نقطة

لما يجي مريض معه *enphyllactic attacks* بعطيه *epinephrine* صح ولا مش غلط

المهم ال *epinephrine* يعمل على توسيع القصبات
طيب ليش ما استخدمناه هون بهاي المحاضره ؟
لانه ال *allergic reaction that come with asthma* بالعادة بكون
enphyllactic attack ما بتكون على مستوى الانف و العيون بتكون
بمستوى اعلى بالافراز

اذا المشكله *enphyllactic attacks with broncho spasms* مباشره
بعطي *epinephrine* اما لو بس *broncho spasms* في ادويه ثانيه
بعطيها بس مش *epinephrine*

و هون هاي المحاضره كلها ما فيها *broncho spasm* لعاد ليش
اعطي *epinephrine*

1. What is the primary mechanism of action of oral antihistamines?

- a) Blocking histamine release
- b) Binding to cholinergic receptors
- c) Inhibiting leukotriene production
- d) Blocking H₁ receptors

2. Which antihistamine is commonly associated with sedation as an adverse effect?

- a) Fexofenadine
- b) Cetirizine
- c) Loratadine
- d) Azelastine

3. Which of the following is NOT a first-generation antihistamine?

- a) Diphenhydramine
- b) Cetirizine
- c) Chlorpheniramine
- d) Azelastine

4. What is the recommended action for minimizing systemic absorption when administering nasal corticosteroids?

- a) Deep inhalation during administration
- b) Avoiding nasal irritation
- c) Avoiding nosebleeds
- d) Avoiding deep inhalation during administration

5. Which nasal decongestant has been linked to effects similar to placebo?

- a) Oxymetazoline
- b) Pseudoephedrine
- c) Phenylephrine
- d) Cromolyn

6. What is the primary purpose of expectorants in cough treatment?

- a) Suppressing cough reflex
- b) Increasing bronchial secretions
- c) Reducing airway resistance
- d) Blocking H₁ receptors

7. Which of the following is NOT an adverse effect of codeine?

- a) Constipation
- b) Dysphoria
- c) Hypotension
- d) Fatigue

9. Which medication is commonly used as a combination cough product with guaifenesin?

- a) Codeine
- b) Diphenhydramine
- c) Cetirizine
- d) Loratadine

10. What is the primary purpose of treating cough with antitussives?

- a) Increasing bronchial secretions
- b) Suppressing the cough reflex
- c) Decreasing airway resistance
- d) Blocking H₁ receptors

- 1. d) Blocking H₁ receptors
- 2. b) Cetirizine
- 3. d) Azelastine
- 4. d) Avoiding deep inhalation during administration
- 5. c) Phenylephrine
- 6. b) Increasing bronchial secretions
- 7. c) Hypotension
- 8. a) Codeine
- 9. a) Codeine
- 10. b) Suppressing the cough reflex

11- A 32-year-old man with a history of opioid addiction presents with cough due to a viral upper respiratory system infection. Which is appropriate symptomatic treatment for cough in this patient?

- A. Guaifenesin/dextromethorphan
- B. Guaifenesin/codeine
- C. Benzonatate
- D. Montelukast

Answer : C

12- A 26-year-old man with a chronic cough takes codeine for cough suppression. He presents to his primary care physician for follow-up. The patient admits to taking this medication three times daily even when he does not have symptoms. The treating physician must be concerned about which of the following effects?

- (A) Addiction
- (B) Diarrhea
- (C) Euphoria
- (D) Excessive anxiety
- (E) Sweating

Answer: A

13- A 6-year-old boy returns home from his last day of school before thanksgiving break. Over the break, he develops a cough, stuffy nose, headache, and fever. His mother administers a cough syrup containing guaifenesin. Which of the following effects is likely caused by guaifenesin?

- (A) Cough becomes more productive
- (B) Cough stops altogether
- (C) Fever diminishes
- (D) Headache resolves
- (E) Headache worsens

Answer: A

