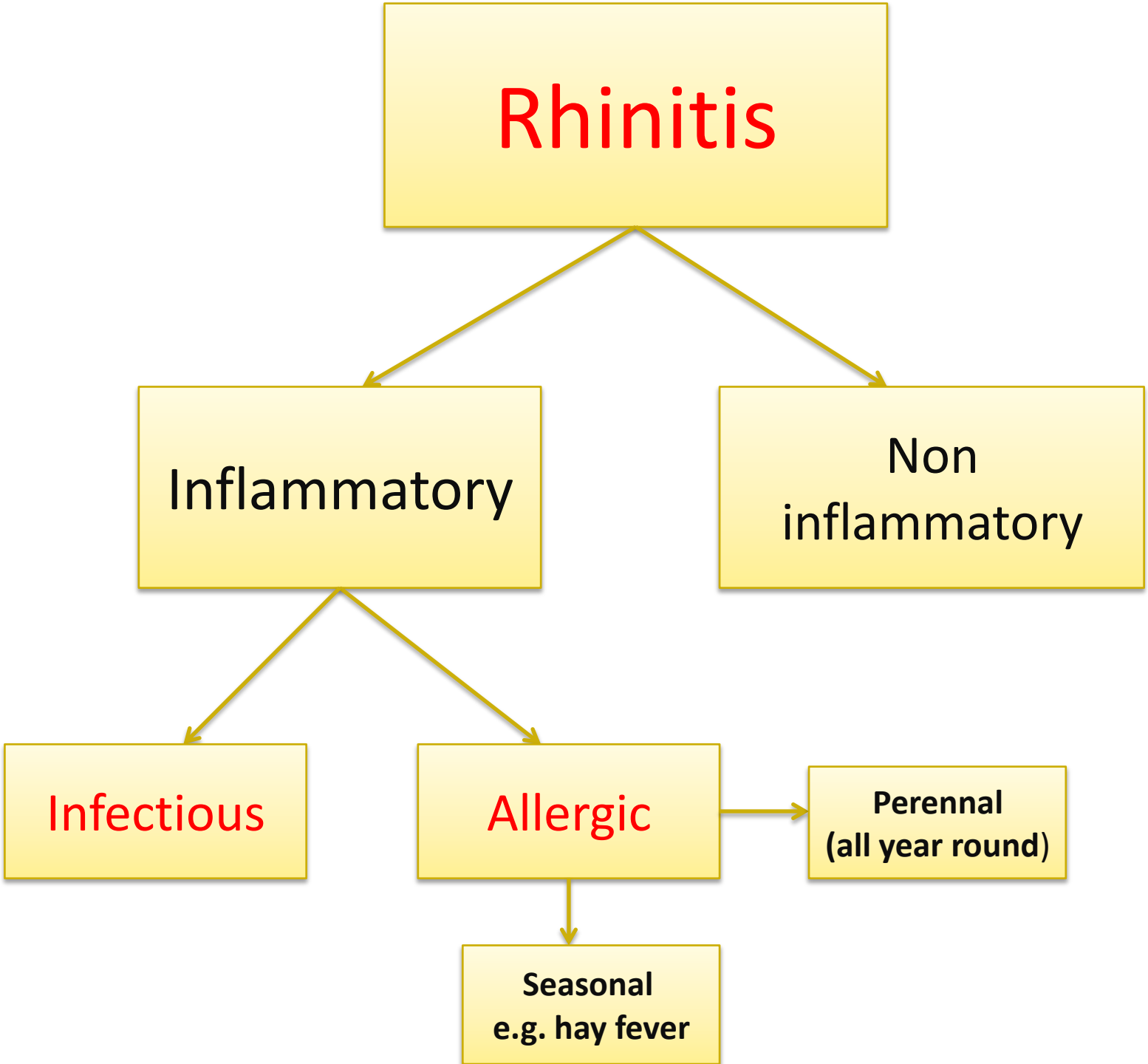
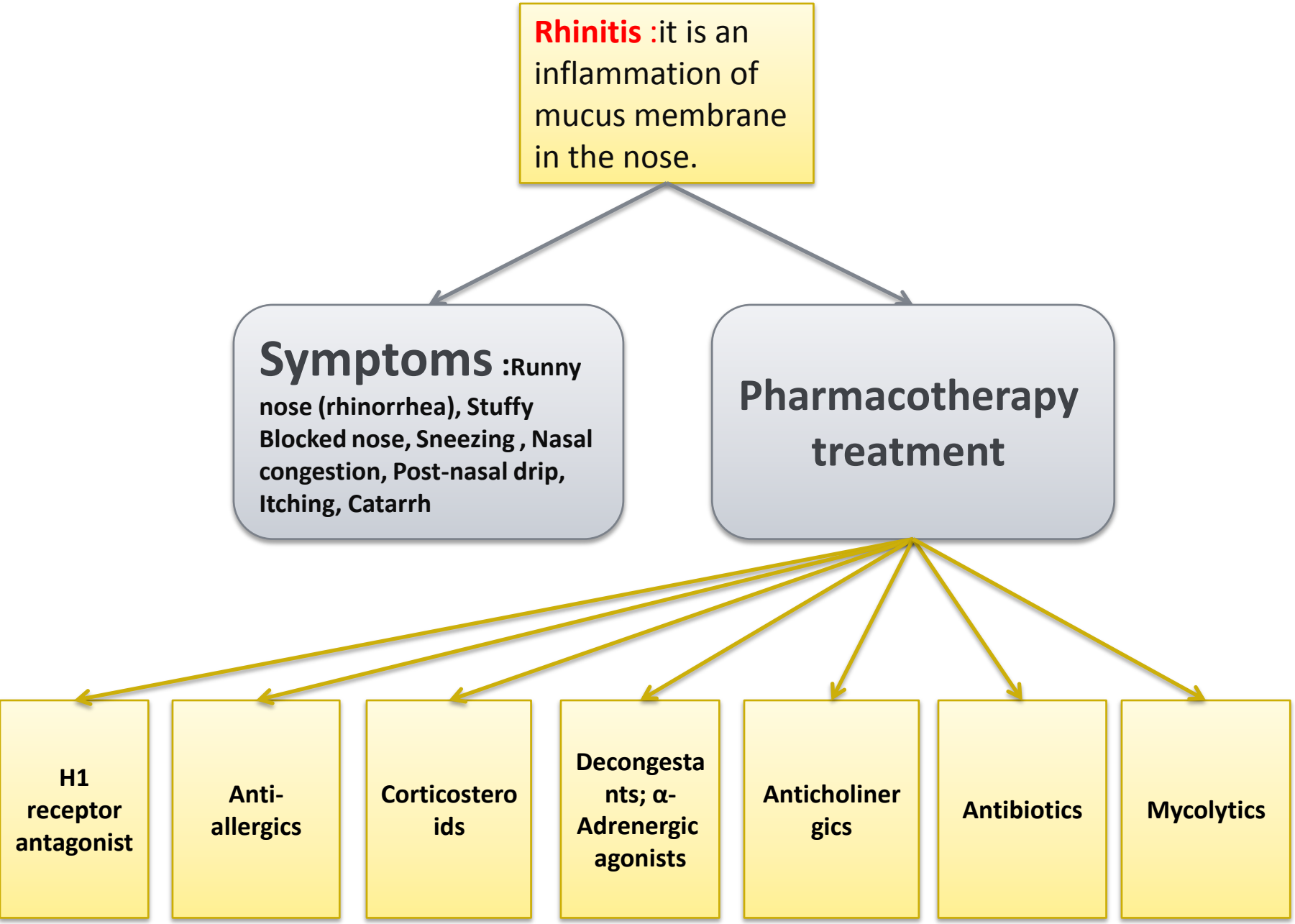
Treatment of rhinitis & cough

Objectives :

- Classify types of rhinitis.
- Specify preventive versus pharmacotherapeutic strategies.
- Expand on the pharmacology of different drug groups used in treatment as antihistamines, anti-allergics, corticosteriods, decongestants and anti-cholinergic.
- Differentiate between productive versus dry irritant cough.
- Compare pharmacology of different expectorants & mucolytics. Drugs used in treatment of productive cough.
- Contrast between peripherally and centrally acting antitussives.


Rhinitis
Inflammatory
Non inflammatory
Infectious
Allergic
Perennal (all year round)
Seasonal e.g. hay fever


Rhinitis :it is an inflammation of mucus membrane in the nose.
Symptoms :Runny nose (rhinorrhea), Stuffy Blocked nose, Sneezing , Nasal congestion, Post-nasal drip, Itching, Catarrh
Pharmacotherapy treatment
H1 receptor antagonist
Anti-allergics
Corticosteroids
Decongestants; α-Adrenergic agonists
Anticholinergics
Antibiotics
Mycolytics

Anti-histamine drugs

	1st generation	2nd generation	3rd generation
examples	Diphenhydramine	Loratidine Cetirizine	Desoloratidine Levocetirizine
Duration of action	Short	Longer "better control"	Longer "better control"
Selectivity	Non-selective	Selective	More selective
Crossing BBB	Cross	Poor crossing	No crossing
Drug interactions	with enzyme inhibitors [macrolides, antifungals, calcium antagonists]	No drug interactions	No drug interactions
Sedating effects	Sedating	Non-sedating	Non-sedating
Side effects	additive pharmacodynamics effects	Minimal side effects	Minimal side effects

Note : Anti-histamines block other receptors than H1 such as: Cholinergic, alpha-Adrenergic, Serotonin But they do not not block Dopamine nor H2

1- Anti-Histamines

Indications linked to H1 blockers	Indications linked to blocking other receptors than H1		
	Drugs	**Action**	**Mechanism**
Allergies: **- Good control of: Rhinitis, Conjunctivitis,** **Urticaria, Flu (cough and sneezing).** **- Poor control of Asthma, Otitis, Anaphylaxis,** **Sinusitis, Atopic dermatitis.**	**Dimenhydrinate , Diphenhydramine Promethazine**	**Vertigo & Motion sickness**	
Itching	**Promethazine**	**Anti-emetic**	**- Decrease firing from internal ear to vomiting center** **- Decrease firing to vomiting center + Anticholinergic**
Others: **Insomnia** **Sleep aid** **Vertigo** **Anxiety** **Cough**	**Chlorpheniramine Dimenhydrinate Promethazine**	**Anti-parkinsonism**	**By anticholinergic action that will decrease thee xtra-pyramidal effects.**
	Cyproheptadine	**Increase appetite**	**By 5-HT modulation Sedation**
	Promethazine, Antazoline	**Anti-arrhythmic actions**	**by Na channel blocking action & local anesthetic effects**

2-ANTI-ALLERGICS

	Mast cell stabilizers	Leukotrienes Antagonists
example	Cromolyn, Nedocromyl	Zafirlukast, Montelukast, Pranlukast
Mechanism of action	Decrease Histamine release [by inhibiting Cl channels] *It does not antagonize released histamine	Block leukotriene actions
Uses	In children for prophylaxis of perennial allergic rhinitis (not used a lot in Asthma, work better in upper respiratory tract allergy)	- Prophylaxis of lower respiratory tract allergies e.g. perennial allergen, exercise or aspirin-induced asthma (Work good in Asthma, less actions in upper respiratory tract allergy)
Side effects	Cough, wheezes, headache, rash.	Elevation of liver enzymes, headache, dyspepsia.

3-CORTICOSTERIODS

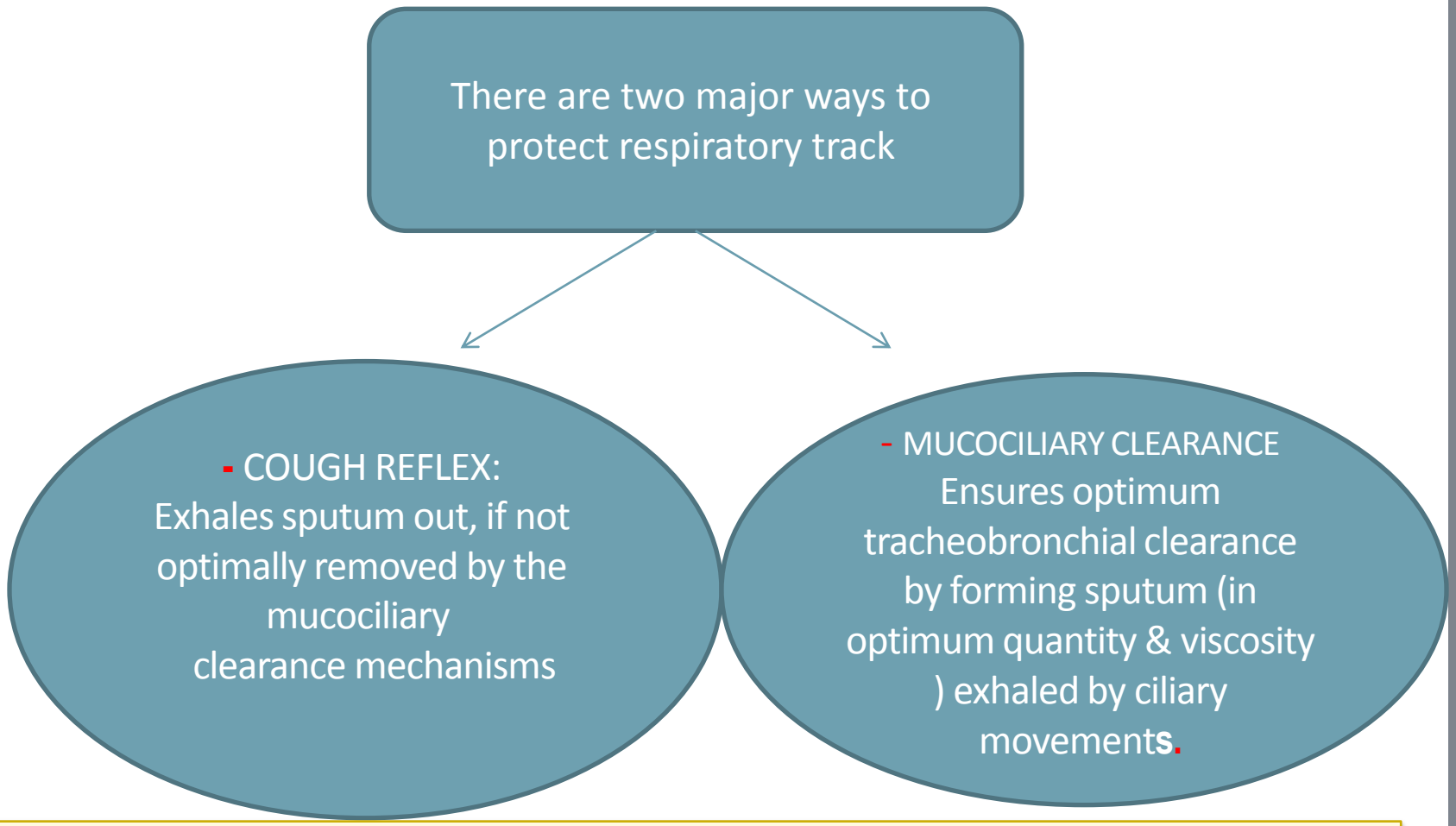
example	Beclomethasone , Budesonide, Fluticasone
Mechanism of action	Inhibition of phospholipase A2 ↓ prostaglandin and leukotrienes
Uses	severe intermittent or moderate persistent symptoms
Side effects	Nasal irritation, fungal infection, hoarseness of voice

4. DECONGESTANTS (α-Adrenergic agonists)

	Systemic	Topical
Example	Pseudoephedrine	Phenylethylamines , Imidazoline
Uses	For treatment of nasal stuffiness	
Side effects	Nervousness, insomnia, tremors, palpitations, hypertension.	Rebound nasal stuffiness

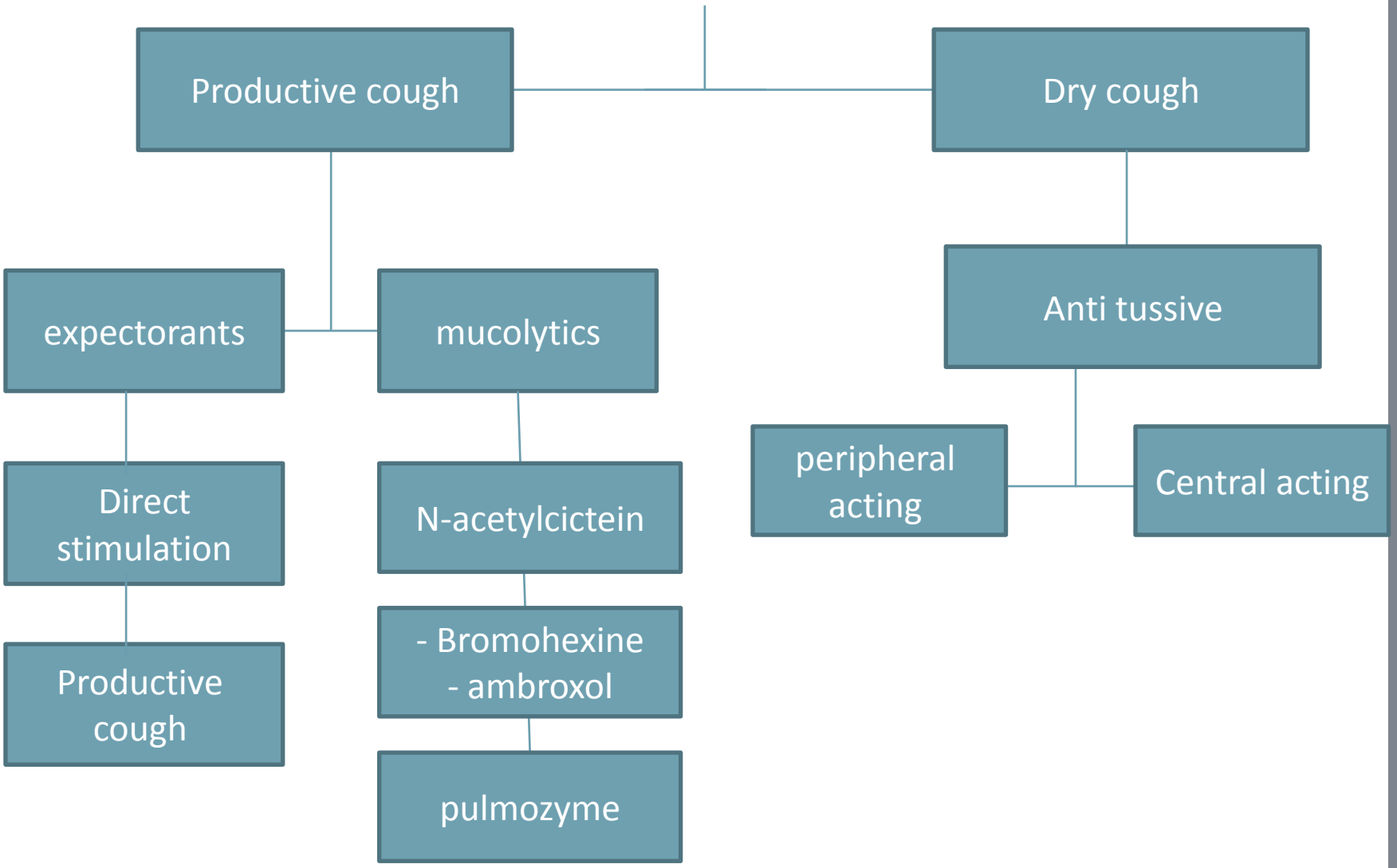
5. ANTICHOLINERGICS

Example	Ipratropium
Uses	- Bronchodilator in asthma. - Control rhinorrhea (excess nasal secretion & discharge). - Effective in vasomotor rhinitis (watery hyper-secretion).
Side effects	minimal systemic side effects



Coughing is sudden expulsion of air from the lungs at an at fast speed (~100 miles/ hr) to rid breathing passage ways of unwanted irritants and it is two types:
- Wet and productive which is useful for clearance.
Dry cough due to many diseases such as cancer, infection and gases. it is may be not - useful and annoying.

Treatment of coughing



Expectorants

Act by removal of mucus through:

	Reflex stimulation	Direct stimulation
Example	**Guaifenesin**	Iodinated glycerol, Na or K iodide/acetate , Ammonium chloride, **Ipecacuahna**
Mechanism of action	Irritate GIT → stimulate gastro-pulmonary vagal reflex → loosening & thinning of secretions.	Stimulate secretary glands → increase respiratory fluids production.
Side effects	Dry mouth (Xerostomia) chapped lips risk of kidney stones (↑uric acid excretion)	Unpleasant metallic taste hypersensitivity Hypothyroidism swollen of salivary glands (overstimulation of salivary secretion) flare of old TB.
Indications	Final outcome is that cough is indirectly diminished Common cold, Bronchitis, Laryngitis, Pharyngitis, Influenza, Measles, Chronic paranasal sinusitis, Pertussis.	

Mucolytics

Act by altering biophysical quality of sputum → becomes easily exhaled by mucociliary clearance or by less intense coughing

	N-Acetylcysteine	Bromhexine, Ambroxol	Pulmozyme (Dornase Alpha or DNAse)	Hypertonic Saline & $NaHCO_3$	Steam inhalation
overview	A free radical scavenger used in Acetaminophen overdose. (an antidote for it)	They increase immune defense: ↓ antibiotics usage ↓ pain in acute sore throat.	A recombinant of human deoxyribo-nuclease-1 enzyme that is neubilized. Full benefit appears within 3-7 days		
Mechanism of action	Breakdown S-S bonds in Glycoproteins by its reducing SH Gp → less viscid mucous	Synthesize serous mucus (sialomucins of smaller-size) so it is: Secretolytic + activate ciliary clearance & transport	Cleavage of extracellular bacterial DNA, that contributes to viscosity of sputum in case of infection	Decrease viscoelasticity by increasing thewater content.	Decrease the adhesivness.
Indications	- Most mucolytics → effective as adjuvant therapy in COPD, asthma, bronchitis, (whenever there is excessive and/ or thick mucus) - In bronchiectasis, pneumonia & TB → they are of partial benefit. - Hardly any benefit in cystic fibrosis & severe infections → Give rhDNAase				

Antitussive

Stop or reduce cough by acting on the peripheral or CNS components of cough reflex.

1. PERIPHERALLY ACTING

A. Inhibitors of airway stretch receptors:

- During bronchoscopy or bronchography: Use local anesthetic aerosols, as lidocaine, benzocaine, and tetracaine

B. Inhibitors of pulmonary stretch receptors in alveoli:

Benzonatate : ↓ sensitivity (numbing) of receptors by local anesthetic action.

CENTRALLY ACTING:

A– opioids: activating μ opioid receptors e.g. Codeine **&** Pholcodine

B- non-opioids:

- antihistamimics >> sedating
- Dextromethorphan

1. **As potent as codeine.**
2. **But no drowsiness.**
3. **Less constipating**
4. **No respiratory depression.**
5. **No inhibition of mucociliary clearance.**
6. **No addiction.**

Antazoline

Prome

Cyproheptadine

Keto

قصة :First GENERATION of H_1 receptor blockers

مرة بنت شربت كلور)Chlorpheniramine(

قامت ماتت من -بسبب- الـ)hydrinate(dimenhydrinate

بعدين فين لقوها؟ يعني ماتت فين ؟ في الـ hydramine((Diphenhydramine

قاموا بحثوا عن القاتل قالوا له انت و معك زولين !!)Antazoline(

قام قال القاتل لا برومو هو ثازين)Promethazine(قام ركب السايكل راح عند الـ)Cyclizine(

راحوا بلد اسمها – بلد علاء الدين-)Azatidine(

بعدين استخبوا فين ؟ مع –كيتو التخين-)Ketotifen(

و شربوا)Cyproheptadine(اعتبروه مشروب من ستار بكس اسمه)Cyproheptadine(.

SUMMARY

-Reem Labani

MSQ

1-Which of the following drugs has sedation effect ?

A- Ketotifen

B- Loratidine

C- Chlorpheniramine

D- Fexofenadine

2-A patient with Parkinson disease which one of the following drugs can be used for his disease ?

A- Antazoline

B-Promethazine

C-Cyproheptadine

D-Promethazine

3- which one of the following <u>is not</u> an adverse effect of Pseudoephedrine ?

A- hypotension

B- insomnia

C- Nervousness

D- palpitations

4- An old man with a productive cough is on one of its medications. But after a while he got Xerostomia and chapped lips. What's the drugs that he's taking?

A. Antazoline

B. Guaifenesin

C. N-Acetylcysteine

D.Benzonatate

4- A medical student who's having an exam after two days, came to the hospital complaining of his runny nose and continuous sneezing and congestions in his nose. What's the best drug to prescribe him with?

A. Ipecacuahna

B. Promethazine

C. Diphenhydramine

D. Levocetirizine

6- A patient with productive cough is on a medication for this cough, but he thinks his voice changes because of this medication. What is it ?

A. Ipratropium

B. Zafirlukast,

C. Dextromethorphan:

D. Pulmozyme

1-C
2-D
3-A
4-B
5-D
6-D

Note: we used a lot of tables from 433 team

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