



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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## COUGH MANAGEMNT

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### Abstract:-

Cough is a disease that affects both adults and children. Cough is a common disease for which patients seek medical attention from primary care physicians. Therapeutic suppression of cough may be of two types: disease-specific or symptom-related. Coughs are classified into two types based on their symptoms: dry coughs and wet coughs. Chronic cough and acute cough are the two types based on duration. For acute cough symptoms, antitussives are given to the patient, which occurs in the upper respiratory tract. For chronic conditions, determining the cause of a chronic cough is crucial to effective treatment. Some medications are also used for the chronic cough condition. In the drugs that are used in symptomatic treatment, some antitussives are used. Dextromethorphan is the main drug that acts as an antitussive.

**Key words:** cough, chronic cough, acute cough, Dextromethorphan, antitussives.

### Introduction:

Coughing is an important defensive reflex that enhances the clearance of secretions from the airways. Some syrups, powders, suspensions, and tablets are available on the market. Covering the cough is not always an easy task. Sometimes physicians avoid unnecessary treatment for paediatric patients. On the other hand, it is worth mentioning that internal medicine physicians are frequently overwhelmed by requests for help from patients who report coughing, alone or together with other nonspecific symptoms such as a mild temperature. In such cases, treatment of symptoms

appears to be a therapeutic approach. This review is helpful to summarize cough management with the help of one main drug (dextromethorphan), which has been tested as an antitussive. It is more effective than other antitussive drugs. In addition, we identify missing pieces of evidence regarding the efficacy and effectiveness of symptomatic cough treatments as well as the associated side effects of drugs. It is a clear and effective treatment established for acute and chronic coughs. Dextromethorphan was established in 1958 by the FDA.

## Methods:

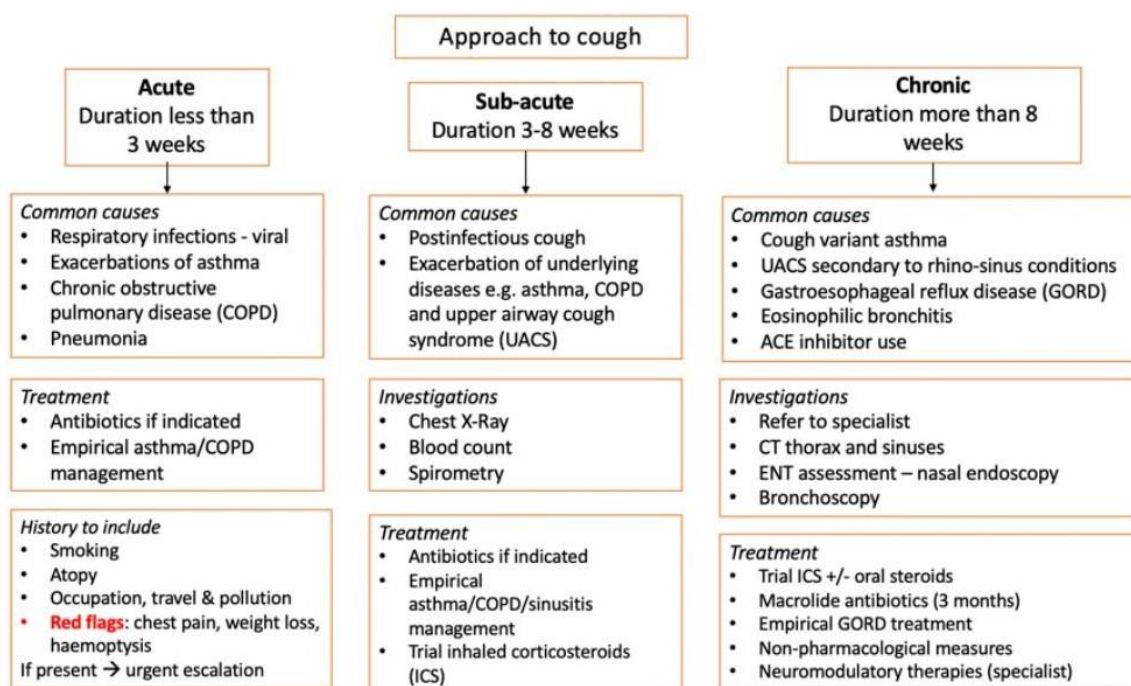
Most of the antitussives were established in 1950. And among them Dextromethorphan has the maximum effect as a cough suppressant. Definition and causes of acute cough, chronic cough, and sub Acute cough.

**Acute cough:** an acute cough has a duration or life period of 3 weeks. Upper respiratory tract infections are the most common cause of acute coughs. It is produced by bacteria or a viral infection. Acute coughs have a short life span due to the infection, and it takes 1 to 2 weeks to recover.

**Chronic cough:** Chronic cough has a duration or life period of 8 weeks or longer. It can be identified by specialist, nasal endoscopy, Bronchoscopy and CT thorax and sinuses. In 1977, R.S. Irwin introduced some causes of chronic cough. In that paper, R.S. Irwin stated that

due to the fact that the number of anatomic locations for afferent cough receptors was small, the number of diseases or conditions that could stimulate these sites and result in chronic cough should be equally limited.

**Sub Acute cough:** sub-acute cough has a duration or life period of 3–8 weeks. specific infections, an increase in bronchial hyper-responsiveness may persist, which can cause a sub Acute cough that can remain bothersome. It can be identified by Chest X-Ray, blood count and spirometry. Some examples of infections that cause the sub Acute cough are M. pneumonia. Post-infectious airway hyper-responsiveness resulting in the sub Acute cough has scarcely been studied. Recent pertussis infection should be ruled out in children and adults with subacute cough, irrespective of any prior vaccination. Cough as a result of B. pertussis infection usually leads to paroxysmal episodes of inspiratory whoop, especially in children. However, it can be absent in adults.



## Anti-tussive drugs:

Currently marketed or overall cough suppressant included centrally acting drug such that opioids and non-opioids and it act on peripherally acting antitussive. The addiction with opioids and non-opioids antitussives that is most common drug is Dextromethorphan are preferred in treatment of acute cough. In the market some drugs are sold by without prescription this drugs are known as Over the counter drugs (OTC). In an meta – analysis of five studies with Dextromethorphan in adult conclude that these central antitussives that these drugs have demonstrated have marginally superior to placebo.

### Clinical study of Dextromethorphan:

Thirty eight male and female have risk for developing an upper respiratory tract infection that is URTI.

Dosing and administration of Dextromethorphan are mostly via oral route.

1. Combination of liquid cough syrup :\_The common OTC formulation contain 15mg /5 ml of Dextromethorphan for every 4 hrs.
2. Sustain release cough syrup: It is also OTC drug which contain 30mg/5ml Dextromethorphan.
3. Liquid filed capsule: It contain mainly 15 -30 mg Dextromethorphan.

4. Oral strip containing 7.5 or 15 mg Dextromethorphan.

5. Most of the combination therapy are used in antitussive. Dosing for Dextromethorphan is 0.5 mg /kg up to 30 mg, administration after 3 – 4 hours in a day

### MOA OF ANTI-TUSSIVES: (DEXTRHOMETHORPHAN)

Dextromethorphan have variety of action in Pharmacokinetics and Pharmacodynamics. Structurally related to opioids drugs but not interact with mu receptor. The main action in cough suppressant is not completely understand. One proposed the action of Dextromethorphan that is it works on the nucleus tractus solitarius it act on the central nervous system and this site in brainstem function as a gate for the cough reflex. Low Bioavailability due to the fastly undergo first pass metabolism.

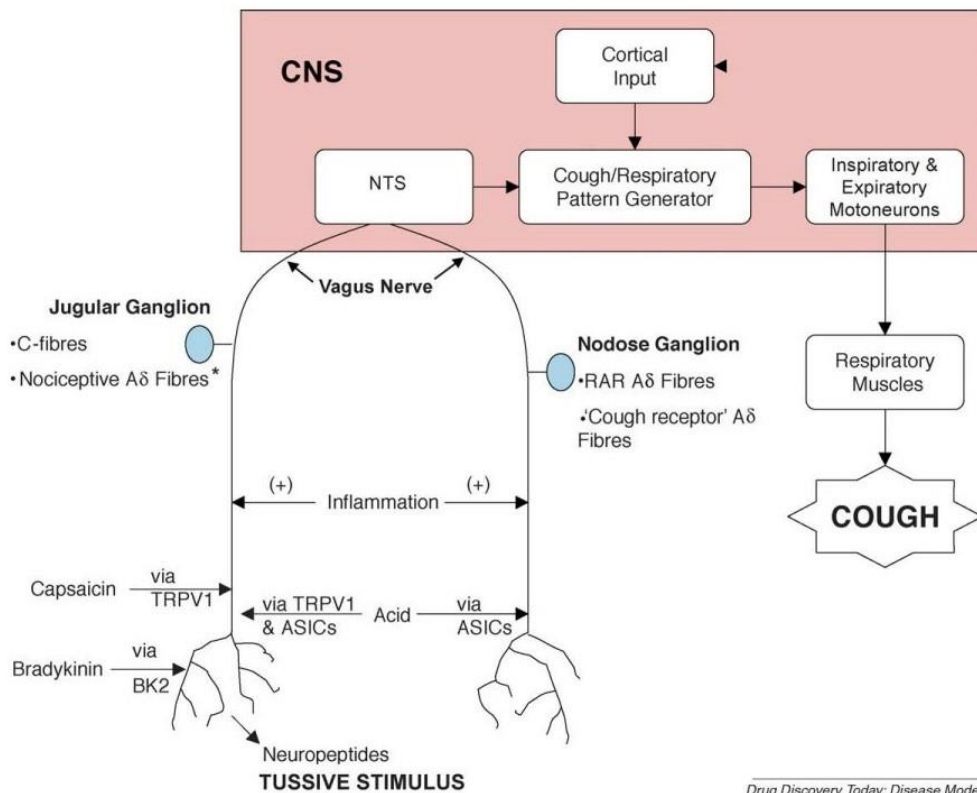
#### Other site of action:

Sigma -1 receptor agonist

Nicotinic receptor antagonist

Serotonin transporter inhibitors

Norepinephrine transport inhibitors



**Effects of dextromethorphan:**

**1. On the Mind:** high dose of DXM causes many psychotropic effects including:

- Confusion, hallucination, inappropriate laughter, agitation, paranoia and euphoria.
- Other sensory changes including feeling of floating and changes in the hearing and touch.

Long term use of DXM is associated with severe psychological dependence.

DOSE (MG)	BEHAVIORAL EFFECTS
100-200	Mild Stimulation
200-400	Euphoria and hallucinations
300-1500	Distorted visual perceptions Loss of motor coordination Out of body sensations

**2. On the Body:** It involves

- Over-excitability, loss of co-ordination, slurred speech, nausea, vomiting, lethargy, sweating, hypertension and involuntary spasmodic movement of eyelids.

The high use of DXM combination with alcohol or other drugs like antidepressant it particularly dangerous and might be life threatening.

DXM with OTC drugs like guaifenesin, chlorpheniramine, acetaminophen that have their own effect like:

- Liver damage, coma, seizures, vomiting, hypertension, lack of co-ordination, etc.

High dose of DXM shows similar effect like other drugs such as:

- Marijuana and ecstasy.
- Moderate to high dose of DXM shows similar effect like ketamine or PCP.

**Legal status of DXM in India:**

Dextromethorphan, guaifenesin, ammonium chloride and chlorpheniramine malate are commonly prescribed for irritations that are triggered by pollutants. This drug combination has also been banned in India.



## Treatment:

### Central Antitussive:

1) Opioids, such as morphine and codeine works centrally on cough center. This types of drugs has side effects and high risk of addiction. It is less effective in cough caused by common cold.

2) Non-opioids antitussive is prefers for acute cough. In this DXM is significantly suppresses acute cough. DXM has slow onset of action and it reaches its peak after 2 hours of administration. Slow penetration through the BBB( Blood Brain Barrier) and retention to the nerve system it results the longer working duration of antitussive.

3) GABA ( $\gamma$ -amino butyric acid) is an inhibitory neurotransmitter in the central nervous system and also found in the lungs. According to Ryan, et al., Gabapentin produces a suppressive effect on cough reflex in the centre.

4) Local anaesthesia such as lidocaine, benzonatate, bupivacaine, and mexiletine has been investigated to suppress coughing. It is the most effective antitussive, but its use is still controversial and becomes the last resort in patients with irritative cough. Local anaesthesia interrupts electrophysiological activity on cough receptors and afferent receptors (e.g. during bronchoscopy). Local administration reversibly inhibits the action potential of vagus-pulmonary afferent nerve. This activity is thought to be caused by inhibition to the voltage gated sodium channel.

5) Diphenhydramine, a first-generation antihistamine H1, is approved in several countries as an over-the-counter (OTC) antitussive. It is reported to decrease cough reflex sensitivity in patients.

6) Butamirate is widely used in Europe as an OTC antitussive. A cross-over placebo controlled study revealed that none of the 34 subjects who finished the study experienced significant improvement after the administration of butamirate.

### Peripheral Antitussive:

1) Levodropropizine is a non-opioid agent that works in the peripheral nervous system. This drug modulates sensory neuropeptides in the respiratory tract and is given orally. A clinical trial on adults in Indonesia indicated that levodropropizine had better antitussive effect compared to placebo and morclofone and was equal to cloperastine

2) Menthol is produced by *Mentha arvensis*. Menthol inhalation reduces cough reflex and can be prescribed as crystal BPC or in a special capsule, although the suppressive property is brief.

3) Throat lozenges can also reduce cough and flu symptoms through relieving activity on the mucosal membrane. The effect of throat lozenges is widely discussed in the fifth American Cough Conference in 2015. Most delegates agreed on the effectivity of throat lozenges, but no studies expressed the effect.

### Mucolytic

Mucolytic drugs non-selectively reduce viscosity and elasticity of respiratory tract secretion by reducing polymer network that is responsible for the gel-like structure of mucus or sputum.

The only mucolytic approved in the United States and Canada is dornase alfa. This drug is given through inhalation with a dose of 2.5 mg/day. A study showed that dornase alfa reduced viscosity and adhesion of respiratory tract secretions and long-term use could increase pulmonary function, reduced damage to lung function, and reduced the need for hospitalization and antibiotic therapy.

### Antibiotics

Antibiotic is only effective to cough caused by a bacterial infection, marked by purulent sputum (e.g. in suppurative bronchitis, bronchiectasis, exacerbated COPD, purulent rhinitis, and sinusitis). It is not indicated for acute bronchitis.

**Conclusion:**

Cough is the most effective defence mechanism to eliminate foreign materials, infection including various pathogens from the respiratory tract. Cough is such system which needed to cleanse the respiratory tract from mucus and secretions. The amount of the respiratory secretions depends on the number of daily exposures to irritants. A cough is dangerous due to its effect on breathing, social activity, sleeping.

The potential benefits of treating cough is preventing the vicious cycle of cough perpetuating cough. Cough can be caused by disruption from the pulmonary or extra pulmonary.

Available drugs for symptomatic treatment of cough include both anti tussives and expectorant drugs. Recently, both the FDA recommended against the use of OTC (Over the counter) products for coughs. It is applicable for young and children. Dextromethorphan is a cough suppressant found in more than 120 over-the-counter (OTC) either alone or in combination with other drugs.

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