

# AI-03007 Flu Medication Information

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**Explain the following drug content. What is the mechanism of action of each compound. What is the fundamental foundation of why it works on flu-like symptoms.**

## **NIGHT PILL**

**Acetaminophen 325 mg**

**Chlorphenamine maleate 2 mg**

**Dextromethorphan HBr 10 mg**

**Phenylephrine HCl 5 mg**

## **DAY PILL**

**Acetaminophen 325 mg**

**Dextromethorphan HBr 10 mg**

**Phenylephrine HCl 5 mg**

**Guaifenesin 200 mg**

Based on the drug contents you provided, here is an explanation of each compound, its mechanism of action, and the fundamental reason why these combinations work on flu-like symptoms.

## **General Foundation for Why It Works**

Flu-like symptoms (e.g., fever, aches, cough, runny nose, congestion) are primarily caused by your body's immune response to a viral infection. The drugs in these pills do not kill the virus. Instead, they target and alleviate the symptoms, making the person feel more comfortable while their immune system fights off the infection. This is known as symptomatic relief. The "day" and "night" versions are designed to address the specific needs of a person at different times: the night pill

includes an antihistamine to promote rest, while the day pill replaces it with an expectorant that is not sedating.

## **NIGHT PILL**

- Acetaminophen (325 mg)
  - Mechanism of Action: Acetaminophen is an analgesic (pain reliever) and antipyretic (fever reducer). Its exact mechanism is not fully understood, but it is believed to work primarily in the central nervous system. It inhibits an enzyme called cyclooxygenase (COX), particularly COX-2, which is involved in the synthesis of prostaglandins. Prostaglandins are chemical messengers that cause pain and fever. By reducing prostaglandin production, acetaminophen reduces both pain and fever.
  - Function for Flu-like Symptoms: It relieves the muscle aches, headaches, and fever that are common with the flu.
- Chlorphenamine Maleate (2 mg)
  - Mechanism of Action: This is a first-generation antihistamine. It works by blocking the action of histamine at H1 receptors. Histamine is a chemical released by the body during an inflammatory response, such as to a virus. It causes symptoms like sneezing, runny nose, and watery eyes. Chlorphenamine maleate also has a sedative effect because it can cross the blood-brain barrier.
  - Function for Flu-like Symptoms: It provides relief from sneezing and a runny nose. The sedative effect is particularly useful for the "night pill" as it helps the user get a restful sleep, which is crucial for recovery.
- Dextromethorphan HBr (10 mg)
  - Mechanism of Action: This is a cough suppressant (antitussive). It works directly on the cough center in the brain, located in the medulla oblongata, to raise the threshold for coughing. It is a non-opioid compound but has similar effects on the cough reflex.
  - Function for Flu-like Symptoms: It calms the cough reflex, providing relief from a dry, hacking cough. This is especially helpful at night to prevent sleep disruption.

- Phenylephrine HCl (5 mg)
  - Mechanism of Action: This is a decongestant. It is a selective alpha-1 adrenergic receptor agonist. It works by causing vasoconstriction (narrowing of blood vessels) in the nasal passages. This reduces blood flow to the swollen tissues, decreasing the amount of fluid leaking from the capillaries, thereby reducing swelling and congestion.
  - Function for Flu-like Symptoms: It relieves nasal and sinus congestion, making it easier to breathe.

## **DAY PILL**

- Acetaminophen (325 mg)
  - Mechanism of Action: Same as above.
  - Function for Flu-like Symptoms: Relieves fever, muscle aches, and headaches.
- Dextromethorphan HBr (10 mg)
  - Mechanism of Action: Same as above.
  - Function for Flu-like Symptoms: Suppresses a dry cough.
- Phenylephrine HCl (5 mg)
  - Mechanism of Action: Same as above.
  - Function for Flu-like Symptoms: Relieves nasal and sinus congestion.
- Guaifenesin (200 mg)
  - Mechanism of Action: This is an expectorant. It works by irritating the gastric vagal receptors, which then stimulates the respiratory tract's glands to increase the volume and reduce the viscosity of secretions (i.e., mucus). It effectively thins and loosens phlegm and bronchial secretions, making it easier to cough them up.
  - Function for Flu-like Symptoms: It helps to clear chest congestion and productive coughs by making the mucus in the airways thinner and less sticky. This is a key difference from the night pill; while the night pill's chlorphenamine addresses a runny nose, guaifenesin in the day pill

addresses chest congestion without causing drowsiness, allowing the user to be productive during the day.