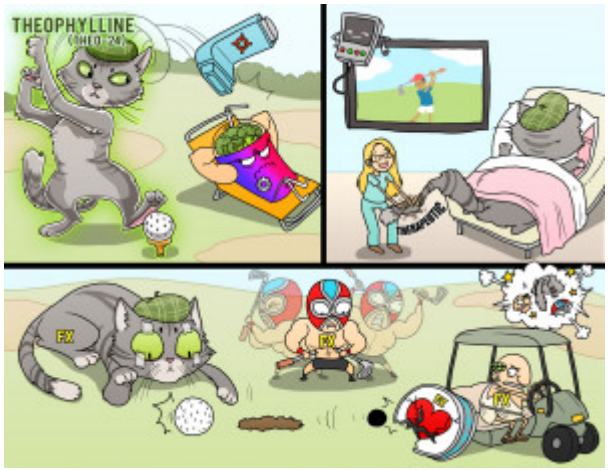
Theophylline (Theo-24)

Theophylline (Theo-24) is a methylxanthine that causes CNS stimulation and bronchial smooth muscle relaxation. This medication is used in the treatment of asthma. Side effects include insomnia, restlessness, arrhythmias, and seizures. Since this drug has a narrow therapeutic range, it is important to monitor the patient's plasma levels. Instruct the patient to notify the health care provider about current medication use, since many drugs increase or decrease the effects of theophylline.



PLAY PICMONIC

Mechanism

Bronchial Smooth Muscle Relaxation
Broccoli Smooth Muscle Smoothie Relaxing
As an effective bronchodilator, theophylline causes relaxation of bronchial smooth muscle by blocking adenosine receptors. This action decreases airway resistance and increases airflow to the lungs.

Indications

Asthma
Asthma-inhaler
Oral theophylline decreases the frequency and severity of asthma attacks and is indicated as maintenance therapy for chronic asthma. This drug's long duration of action in the sustained release form makes it an appropriate medication for patients with nocturnal attacks. Although intravenous theophylline is available, this route is used only in emergencies due to the risk of fatal cardiovascular reactions.

Side Effects

Insomnia
Taped-awake-insomniac
Since this medication causes CNS stimulation, an elevated theophylline blood level may cause insomnia.

Restlessness
Restlessness-wrestler
An elevated theophylline blood level may cause restlessness. Avoid giving theophylline with caffeine to prevent excess CNS excitation that may exacerbate the restlessness.

Arrhythmias
Broken Arrhythmia-drum
Theophylline toxicity, which typically presents with drug plasma levels greater than 20 mcg/mL, may cause arrhythmias such as ventricular fibrillation. Administering lidocaine (see Picmonic "Lidocaine") may help control severe cardiac dysrhythmias.

Seizures
Caesar
Theophylline toxicity, which typically presents with blood levels greater than 20 mcg/mL , may cause seizures. Administering IV diazepam may help decrease seizure activity.

Considerations

Sign up for FREE at picmonic.com

Narrow Therapeutic Range

Narrow Therapeutic-massage Range

Since theophylline has a narrow therapeutic range, the dosage of this drug must be carefully managed in relation to the patient's plasma levels. If the patient presents with symptoms indicating a mild reaction (i.e., nausea, vomiting, diarrhea, insomnia, and restlessness), the medication should be stopped immediately before more serious symptoms associated with toxicity occur (i.e., ventricular fibrillation, convulsions). Drugs such as phenobarbital, phenytoin, and rifampin decrease the effects of theophylline by inducing hepatic drug-metabolizing enzyme production. Medications such as cimetidine and ciprofloxacin inhibit hepatic function and cause increased theophylline plasma levels.

Monitor Plasma Levels

Monitor and Plasma-TV

Monitoring theophylline plasma levels is necessary to ensure therapeutic effects and avoid toxicity. Most patients tolerate theophylline blood levels between 5-15 mcg/mL. Toxic plasma concentrations are considered >20 mcg/mL. Important to note that adverse events have been observed at therapeutic serum levels.

Sign up for FREE at picmonic.com