

Therapeutic Agents Used in Dentistry

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Introduction

This essay aims to discuss therapeutic agents used in dentistry (American Dental Association [ADA], 2024). It will discuss codeine and ibuprofen in terms of class, nomenclature, indication for use, pharmacodynamics, pharmacokinetics, drug interaction, and side effects. It will also provide knowledge regarding the principle of prescription writing. It will briefly discuss the definition of pharmacopeia, legend drug, therapeutic index, and biologic equivalence. It will briefly discuss scenarios for the dentist regarding drug prescriptions.

Nomenclature

The nomenclature of ibuprofen is (RS)-2-(4-(2-methylpropyl) phenyl) propanoic acid

Class

Ibuprofen belongs to nonsteroidal anti-inflammatory drugs (Ngo & Bajaj, 2024)

Indication for use

Ibuprofen is actually used in cases of inflammation to control mild to moderate. It is given in fever, dental pain, osteoarthritis, kidney stones, and pain of other origins. Almost 60% of the people show a response to ibuprofen.

Route of administration

It can be administered via multiple routes like mouth, rectal, topical, and intravenous routes. It is metabolized in the liver. The onset of action occurs in 30 minutes, and its half-life is 1.5 to 3 hours. 95% of the excretion occurs via urine.

Pharmacodynamics

Ibuprofen works via inhibition of cyclooxygenase (COX) enzymes. Cyclooxygenase (COX) enzymes are the enzyme that converts arachidonic acid to prostaglandin H₂ (PGH₂). Prostaglandin H₂ (PGH₂) is

converted into other products which regulate inflammation, pain, and fever and thromboxane A₂. Thromboxane A₂ stimulates the binding of platelets, helping in the clotting of blood.

Dosing

Ibuprofen is administered at an initial dose of 400 mg (with a dose of about 5.7 mg/kg) and repeated every 12 hours. The sustained release is given as a 200 mg tablet repeated 12 hours daily (Ngo & Bajaj, 2024).

There are certain adverse effects associated with the administration of ibuprofen. These include nausea, Diarrhea, dyspepsia, constipation, gastrointestinal bleeding, ulceration, rash, dizziness, headache, and salt and water retention.

Drug interaction

Taking ibuprofen with alcohol may increase the risk of GI bleeding.

- Codeine
- Class
- Codeine is an opiate (U.S. Food and Drug Administration [FDA], 2026)
- Nomenclature
- Indication for use

Codeine is a drug that is actually used to treat pain and cough. It is also used to treat Diarrhea.

Route of administration

It is administered orally, rectally, intravenously, intramuscularly, or subcutaneously.

Pharmacodynamics

Codeine is an opiate, so it affects the receptors in the brain, thus modulating the ability of the brain to perceive pain sensations.

Pharmacokinetics

It is metabolized in the liver. Its biological half-life is 2.5 to 3 hours, and its duration of action is 4 hours.

Dosing

Codeine is given as 15 to 60 mg almost four to six times, depending on the need. The maximum dose can be increased up to 350 mg per day.

Drug interaction

Codeine also persists in some of the drug interactions. It is found to show drug interaction with isocarboxazid, Linezolid, phenelzine, methylene blue, tranylcypromine, naltrexone, and procarbazine.

Adverse effects

The main side effect of the use of codeine includes drowsiness and constipation. Other side effects include nausea, vomiting, Diarrhea, dry mouth, miosis, euphoria, dysphoria, orthostatic hypotension, and urinary retention.

Therapeutic Index

It is the ratio between the safe dose of the drug to its therapeutic toxic dose. It measures the dose of the drug, which can be safely administered without side effects. The more the therapeutic index, the safer the drug is. The index is also known as the therapeutic ratio.

Pharmacopeia

Pharmacopeia is a form of a book that is published by the authorities from the government (United States Pharmacopeia [USP], 2024). It contains all the information regarding a drug, from its name, nomenclature, class, mechanism of action, indications, contraindications, and side effects to the method of preparation. It's like an encyclopedia of drugs.

Legend drugs

Legend drugs are a list of drugs that are under approval by the U.S. Food and Drug Administration (FDA). The U.S. Food and Drug Administration (FDA) makes sure it is prescribed by a particularly licensed physician or pharmacist for the use of specific patients only. These drugs can be from the narcotics or nonnarcotics categories.

Biologic equivalence

Biologic equivalence measures the ability of two different drugs with identical active ingredients to show the same bioavailability and the same physiological effects on the site of action (World Health Organization [WHO], 2024).

General principles of prescription writing

Prescription writing is one of the basic techniques that every physician should know. All the relevant information regarding the patient should be on the prescription so that there is clear knowledge regarding to whom the drug is prescribed. All information regarding the doctor who is prescribing the drug should be mentioned. The reason for prescription with proper diagnosis should be mentioned. The correct date and time should be mentioned. Drug allergies, if present in the patient, should be mentioned. Write in clear words the name of the drug, its dose, frequency, and duration. Explain the patient's regimen and write in the language that the patient can understand.

The prescription label

A prescription label should have Product Names and Date of Initial U.S. Approval, Recent Major Changes, Drug Interactions, Dosage Forms & Strengths, Indications and Usage, □ Dosage & Administration, □ Contraindications, □ Boxed Warning, Adverse Reactions, Use in Specific Populations □ Patient Counseling Information.

The strategy in my clinic is done as one of the assistants checks the prescription before a person leaves.

My principle for avoiding self-medication is with the aid of proper counseling in clinics, meetings, pamphlets, seminars, and discussions. I will try to talk to the patient in a friendly manner and will give complete knowledge regarding drug overdose. I will also counsel the patient about whom they can contact in case of any illness or any drug overuse.

Noncompliance regarding therapeutic medications

these include demographic factors like age, gender, education, etc., psychological factors, patient knowledge, patient-physician relationship, use of abusive drugs, memory, treatment complexity, route of administration, side effects of drugs, taste, the validity of drug in stores, long waiting hours

and financial issues (ADA, 2024).

Conclusion

Some of the drugs used in dentistry are codeine and ibuprofen, usually to control pain (ADA, 2024; FDA, 2026). A drug prescription should be neat and clean, having all the necessary information in it. The dentist should counsel the patient regarding drug overdose and make sure the prescription is complete before the patient leaves the clinic.

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