



## Risks Due to Poor Prescription of Medications in Stomatology

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DOI: 10.31080/ASDS.2024.08.1761

Received: November 20, 2023

Published: December 15, 2023

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### Abstract

A bibliographic review was carried out on the main risks and complications due to poor prescription of medications in dentistry. The main risks due to incorrect prescription of medications in dentistry were described in the present work, where the cardiovascular, hepatic, renal and hematological allergic types were highlighted.

**Keywords:** Poor Prescription, Stomatology

### Introduction

This chapter is crucial, given the international situation with the defective therapeutic management of multiple infectious and other diseases, which have a direct and indirect impact on the oromaxillofacial complex. A large percentage of these diseases are considered to be of non-specific origin because they are polymicrobial, which in most cases must be treated empirically, and others are viral that do not require the prescription of antibiotics. There are already multiple investigations showing that more than fifty percent of the medications prescribed were unnecessary, and the rest were supposed to be prescribed, so almost half have errors in the doses, intervals or simply, the route of administration was not appropriate. at the time of diagnosis. In stomatology the percentages are higher than those mentioned above, up to eighty percent being mentioned in the case of antimicrobials [1].

These aspects and others have contributed to the severe increase in cases of antimicrobial resistance. It is essential that the stomatologist masters the principles of prescribing medications, whether antimicrobial or any other classification. Procedures in the career and in related specialties almost always require some complementary medication, whether pre-, trans- or post-operative. Medicines have become the most used medical technology in current times. These have saved the lives of millions of people, and prevented countless pathologies, mainly since the second half of the 20<sup>th</sup> century. Excessive and/or inappropriate use has made the consumption of medications a public health problem. Current pharmacoepidemiology research shows that the use of medications is one of the main causes of death globally [2,3].

### Objective

Describe the risks due to poor prescription of medication in stomatology.

### Reference Search Methods

The scientific information was compiled through a search using the following descriptors in English: The Medical Subject Headings (MeSH): "medication, dentistry, risks in dentistry, prescription

### Analysis strategy

The search was based solely on poor prescription of medications in stomatology.

### Developing.

The author considers the rational use of a given medication, regardless of its category or family, when it is prescribed at the appropriate time for the patient according to their clinical evolution, with the appropriate intervals, doses, routes of administration, and with an affordable cost for the patient, family members and society in general. However, irrational use or inappropriate prescriptions of multiple medications is very common. The abusive use of medications, sometimes out of complacency, contributes to prolonging and increasing the mistaken beliefs of the patient, and sometimes of the prescriber himself, that all health problems are always resolved with medications regardless of the semiology that the patient presents.

Government strategies have been established around the rationality of the use of medicines, in which a series of lines of action are expressed aimed at verifying processes of selection, prescrip-

tion, dispensing and use of medicines, so that they are developed in a technical manner, independent of economic interests and in the search for the best possible therapy. There are multiple forms and guides that exist for prescribing medications. The reason for the persistence of this problem requires an in-depth study of the possible factors that lead to making these errors. It must also be taken into account that on many occasions there are also patients who self-medicate irresponsibly, consuming different medications at the same time (polypharmacy), due to open sales in different pharmacies [2,4].

Added to this is the increase in the geriatric population who, on many occasions, when they come to our consultations, live alone, without anyone supervising their schedule and intervals of drug consumption. These aspects greatly influence the appearance of multiple negative reactions and antimicrobial resistance. Drugs most used in dentistry consultations. In the dentistry branch, the list of medications used is long and varied, although it is smaller compared to the field of medicine in general, the professional has a large therapeutic arsenal to face the different conditions that arise.

Among the alterations that are treated are those of microbiological origin, within these they are subdivided into bacterial, viral and fungal, and there are traumatological ones. In addition, there are the painful and inflammatory processes that accompany these aforementioned processes. Pharmacological medical prescription is studied from the undergraduate level, then the dissimilar specialties are delved into and from there the professional must stay as updated as possible throughout his or her professional career. Always complying with the principles of selection of different drugs, with responsibility and scientific rigor [4,5].

To be successful in this, logical-deductive reasoning must be carried out, which is derived from the establishment of an exhaustive physical examination, an adequate study, which leads to an accurate diagnosis, and from there increases the possibility of adequately treating the patient. The author calls this process the ideal prescription triad. (view image)

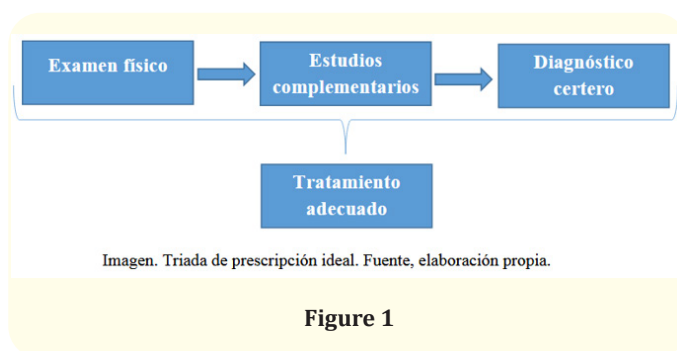


Figure 1

**Physical exam** It is essential to carry out a detailed physical examination to know the clinical characteristics of the condition(s) that the patient presents because, as will be seen later, they are important parameters when selecting therapy. **Complementary studies** It is inviolable to carry out an adequate study of each patient, which, depending on each case, the support will be based fundamentally on hematological and/or microbiological laboratory studies, and imaging studies. Well, they are the ones that will corroborate the diagnostic impression in addition to giving us an idea of what the patient's systemic status is like and how the disease affects them. In the case of imaging, it will give the possibility of assessing the extent of the process, involvement of important structures, etc. **Accurate diagnosis** When an adequate diagnosis is made in a timely manner, a more effective treatment plan can be developed and the patient will have a better prognosis [6].

**Proper treatment** This term, in our opinion, should not be established in a general way, but rather, the appropriate treatment is for each patient individually, depending on the characteristics of the patient, the conditions of the institution where it is treated and the experience and preparation of the patient. professional. In stomatology, as in any other branch of medical sciences, adequate prescription is possible if the professional has knowledge based on updated and reliable information. When a medication is selected, it must be appropriate to the clinical and physiological needs of the patient, indicated at an exact dosage for the patient's individual requirements, for an adequate period and at the most affordable cost.

**Within the pharmacological arsenal in Stomatology, we can count on**

Management of pain, inflammation and hyperthermia.	Management of infectious processes	Management of anxiety and stress
Local anesthetics	Antibacterial	Anxiolytics
Non-steroidal anti-inflammatory drugs	Antifungals	
Steroid anti-inflammatories	Antivirals	
	Antiseptics	

Table 1

The high number of patients called poly-ill patients make prescriptions a challenge for the professional. But, it is the prescriber's obligation to prevent and avoid prescription errors and the use of dissimilar medications. When prescribing a certain drug, one must have knowledge and general guidance from the pharmacological, epidemiological, and social impact. Nowadays, important parameters such as efficacy, safety, convenience and cost should not be left aside, with the aim of achieving adequate therapy. Complying with these criteria increases the quality of care for patients, and they must also be guided and taught the functions of the medication and when and how it should be consumed [2,3].

If these factors are ignored, different undesirable effects could be triggered, which will be mentioned in the following box.

All these effects must be taken into account when indicating a specific treatment. In the case of pediatric patients, other criteria such as weight, height, personal and allergic history of the parents should always be considered. Which is not to say that they are not taken into account in adults, but in infants it is inviolable. It plays a key role in having adequate human and material resources, explaining to the patient and, in addition, writing a method so that they have a guide and do not have to refer to memory, to avoid confusion that can result in severe complications. It is important to make it clear to the patient how he has to prepare the medication if necessary, the ideal times, time intervals and even storage. The patient and family must understand that even when all the principles are met, there is always a minimum percentage of any of the above complications occurring. Knowing the pathophysiology of diseases, the treatment protocols for different conditions, knowing how to classify and determine possible prognoses, are parameters that allow us to greatly avoid the risks and complications due to poor prescription [4-7].

Risks and complications for the patient	Negative economic and social effects
Insufficient therapeutic effect	Increase in the number of hospital admissions
Overdosages	Increase in hospital stay
Adverse reactions	Increase in financial expenses for the patient and family
Risky drug interactions	Increase in economic expenses for the state
Bacterial resistance to antimicrobials	
Hepatic injury	
Kidney damage	
Cardiovascular damage	
Allergy to local and/or general anesthetics	
Damage to the central nervous system	
Drug dependence	
Gastrointestinal disorders	
Dental alterations	
Peri- and intraoral soft tissue conditions	
Embryological damage to the infant and/or the mother	

Table 2

Mastering the evolutionary stages of harmful processes, the stages of wound healing of different tissues, will only facilitate the success of medical care. Therefore, professionals must be in constant study and updating on this topic, delving deeper with the scientific rigor and responsibility that the topic deserves. Using an inadequate therapeutic protocol, which has not been tested, endorsed, or recommended by prestigious institutions with scientific evidence, can cause severe damage to the affect, such as drug reactions. Bringing with it high morbidity, mortality, poor compliance and little success in treatments, as well as high medical costs, which leads to low quality of health services. The complexity for the dentist is how broad this topic is, and with how fast the advancement of science and technology is, it is almost impossible to stay up to date on all the content. Hence the importance of studying each case individually, if possible as a team, step by step, in a logical order [7,8].

Constant consultation between the dentist and the family doctor is necessary, because the medical prescription for the dental pathology will interact with the treatment of the underlying pathology, giving rise to justified polypharmacy that substantially increases the risk of interactions and adverse events. In everything that concerns pharmacology, the discovery of new active ingredients and evidence that vary the therapeutic guidelines for dissimilar harmful events is constant. Along with these advances come new adverse effects or interactions.

Benefits of an adequate prescription

For the patient	From the economic and social
The oral and general health of the patient is preserved or improved	Minimize health care costs
Greater effectiveness in the use of medications	Rational use of medication
The risks of unnecessary polypharmacy are minimized	The opinions of patients are respected in all therapeutic decisions.
Decreases the time of dental care	
Complications associated with infections are reduced	
Adverse drug reactions are avoided	
Bacterial resistance is avoided	
Drug interactions are avoided	
Reduces morbidity due to malpractice	
Reduces mortality directly and indirectly related to prescription iatrogenesis	

Table 3

In the medical sciences there are endless classifications, principles, standards and protocols, all with different meanings and objectives, but with a common characteristic, that of promoting the quality of care for those in need. In general, the error rate in prescribing medications to control pain and inflammation is not as large as with other drugs. This is evident in the daily work in dentistry consultations, where attention is paid to many patients who, due to their dissimilar characteristics, often cause many doubts and fears for the professional to prescribe an antimicrobial [7-9].

The stomatologist must be governed by all these parameters to get as close as possible to excellence. The main aspects to take into account when prescribing an antimicrobial are compiled below.

#### Principles for prescribing an antimicrobial in stomatology.

- Origin of the patient and inoculation of the infection: community or nosocomial.
  - Topographic location of the infection: skin, oral mucosa, periodontal tissues, nasal mucosa, salivary glands, etc.
  - Type of infection: abscess, cellulitis, abscessed cyst, foreign body (oral prosthesis) or physical obstruction (sialolithiasis), etc.
  - Time of evolution (acute and chronic) and speed of establishment (germ virulence)
  - Host-dependent factors: age, immune status, kidney and liver function, pregnancy and lactation, allergic phenomena, previous treatments, etc.
  - Possible causal germ: gram-positive, gram-negative, aerobic, anaerobic, facultative, aerotolerant, microaerophilic.
  - Determine the possible germ: isolation, identification and determination of its antimicrobial sensitivity.
  - Select the antibiotic by: spectrum of action, pharmacokinetics, its possible interaction with other drugs, etc.
  - Choose the route of administration: intravenous (IV), intramuscular (IM), orally (PO), drops, topical (cream, ointment).
  - Dosage and administration intervals.
  - Duration of antimicrobial treatment.
  - Adverse drug reactions
  - Cost of the drug.
- **Origin of the patient and inoculation of the infection:** community or nosocomial. It is an important element to take into account because it guides us about the possible behavior of the infection. Nosocomial conditions are more complex to treat, due to the characteristics of the causative germs. This sometimes guides the professional to take a more aggressive approach in the treatment.
  - **Topographic location of the infection:** skin, oral mucosa, periodontal tissues, nasal mucosa, salivary glands, etc. Depending on the location of the infection, one or more causal agents will be suspected, thus making it possible to establish empirical therapy or not, also facilitating the search for a diagnosis [8-10].
  - **Type of infection:** abscess, cellulitis, abscessed cyst, foreign body (oral prosthesis) or physical obstruction (sialolithiasis), etc. It is essential to be clear about this before proceeding with the prescription, because each condition must be studied independently, complying with the principles of treatment, which are dental, medicinal and surgical. Depending on each case, it will be decided whether they are carried out separately or it combines.
  - **Time of evolution** (acute and chronic) and speed of establishment (germ virulence) It will give us an idea of how the condition has evolved, the host's defenses, the aggressiveness of the germ, the urgency with which we must act to resolve the morbid process.
  - **Host-dependent factors:** age, immune status, kidney and liver function, pregnancy and lactation, allergic phenomena, previous treatments, etc [10,11].
  - Depending on each parameter, this will be the behavior to follow. These sections are detailed in depth in other chapters. Age is important since in the case of borderline ages such as pediatrics and geriatrics, each one has its physiological characteristics that should not be overlooked. The immune status and allergic phenomena must be kept in mind at all times due to the severe damage they can cause. Systemic conditions and within these, kidney and liver function play a predominant role when deciding which drug to prescribe, depending on the affected organ, the drug will be chosen according to its pharmacokinetics [10,11].
  - Pregnancy and breastfeeding are states or stages in which there is a high risk of affecting the mother and the proper development of the baby, due to the possible teratogenic effects that the antimicrobials used may have. It is essential to thoroughly question the patient and family about all the treatment they have received, because it will provide us with information on the level of resistance of the causal agent(s).
  - **Possible causal germ:** gram-positive, gram-negative, aerobic, anaerobic, facultative, aerotolerant, microaerophilic. Suspicion of the etiological agent is basic for the initiation of therapy with any antibiotic. Due to its polymicrobial nature, in the vast majority of cases it is empirical, but with scientific support, since it is fundamentally based on clinical-epidemiological elements [10,11].
  - **Determine the possible germ:** isolation, identification and determination of its antimicrobial sensitivity. The fundamental pillar to eliminate any infectious process is to determine the causal agent and subsequently discover its antimicrobial sensitivity.
  - **Select the antibiotic by:** spectrum of action, pharmacokinetics, possible interaction with other drugs, etc. It is essential to analyze several parameters directly related to the medication to be used, within these are the spectrum of action and its pharmacokinetics (absorption, distribution, metabolism and excretion), which are essential to achieve control and eradication of the morbid process in a manner satisfactory.

- **Choose the route of administration:** intravenous (IV), intramuscular (IM), oral route (PO), drops, topical (cream, ointment) [10,12].
- The efficient selection of the administration route to be used is mainly determined by the severity of the infection. In addition, pharmacokinetic factors must be taken into account, such as: the intestinal absorption fraction of the drug, the patient's circulatory status and even the dose of antibiotic necessary to reach the minimum bactericidal concentration. Dosage and administration intervals. These two aspects depend on the pharmacokinetics of the prescribed medication, which in dental practice the criteria to take into account continue to be quite empirical. Despite this, the dosage and its interval are determined considering historical pharmacokinetic parameters, such as the temporal evolution of plasma levels, elimination half-life, volume of distribution, metabolism and hepatic and renal clearance, percentage of binding to plasma proteins and bioavailability of the drug by the selected route of administration [10,11].

#### Duration of antimicrobial treatment

This depends on the antibiotic prescribed, whether it is dose or time dependent, in addition to the characteristic of the infection and the causal agent and its response to treatment. Adverse drug reactions. This section cannot be missed in the interrogation, asking the patient and family if they are allergic to any medication, and if they are not, they must specify if they have ever consumed it or if they are treatment-naïve.

#### Cost of the drug.

Among the characteristics of the ideal drug is that it resolves the situation for the affected person with the lowest possible cost. Inappropriate medication prescribing practices. The professional must avoid the aforementioned inappropriate medication prescribing practices at all times. Drugs should not be used in situations that do not warrant it, or non-pharmacological behaviors should be ignored when necessary [12,13].

It is incorrect to sign and/or coin blank prescriptions. It is against the law to forge the prescriber's signature. Prescribing medications to people who have not been seen in consultation is known as complacency prescriptions or hallway prescriptions. It is reckless to prescribe drugs of questionable efficacy and/or safety, or their unjustified combination. Incorrect selection of the medication(s) for the problem diagnosed in the patient. It is dangerous to fail due to excess or defect, that is, over-prescribing (polypharmacy) or under-prescribing medications. When the dosage, choice of route of administration and/or duration of treatment is failed, the prognosis or result, long or short term, will not be entirely favorable [12,13].

Relevant patient characteristics should not be omitted for the adjustment of a given therapy. It is inexcusable to provide insufficient or no explanation to the patient or family of the main aspects of the prescription. It is inhumane to prescribe expensive drugs if the problem can be solved with one more accessible to the patient, since, surely, there will be lower cost alternatives that are equally effective and safe. The misguided belief that generic drugs are of lower quality than their brand-name counterparts must end. To Prescribe any new medicine, there must be an adequate comparative evaluation of its benefit and cost. Qualified professionals should be trained to monitor drug therapy deficiencies [12,13].

This action can contribute to the early detection of therapeutic failure and/or adverse drug reactions. Using illegible handwriting when preparing prescriptions only causes confusion for the pharmacy specialist, so everything possible must be done to improve handwriting. Do not use abbreviated or concise forms to describe medication dosages. Avoid inappropriate delivery of instructions to the patient, as well as not clearly and precisely detailing pharmacological and non-pharmacological measures.

#### Frequent prescription errors in stomatology

In Stomatology consultations, it is previously known that training and pharmacological mastery is insufficient and that irrational prescription of medications is very common. The misuse of medications in clinical practice is evidenced by the unjustified prescription of multiple active ingredients, medications that are not related to the diagnosis, the inappropriate use of various types of drugs, and the presence of adverse reactions that could have been avoided. Although this situation has several origins, it mainly shows the complexity of achieving a logical and accurate connection between pharmacological knowledge, clinical knowledge and prescription practices, in short, putting theory into practice. Without the desire to justify it, it can be argued that these risks and complications due to poor prescription mentioned above are sometimes the product of human factors, such as the professional's inattention, exhaustion due to on-call or overwork, confusion or lack of interest in studying, investigate and consult information. These errors may sometimes be minor or insignificant, but they predispose the patient to multiple sequelae and complications that could be fatal [12,14].

Also influencing is the high number of patients who come to the wards and consultations with multiple diseases added to the dental or orofacial condition they present, making it difficult for the stomatologist to prescribe accurately and effectively. Since in every procedure you must take into account very important factors such as pain and inflammation management, as well as avoiding possible complications of odontogenic septic processes, among others. Among the main errors made in Stomatology are inappropriate doses, intervals, routes of administration and combinations.



### Medication errors in stomatology.

First of all, make it clear that this type of error, like any other, is more than preventable [12, 13].

The population tends to consume different medications, without thinking that every drug consumed when it interacts with the body can present adverse reactions and consequences. In Stomatology it is common to see patients who were self-medicated by family, friends and by their own decision. That they believed that, if another person resolved with a certain drug, they would also suffer that fate, unfortunately this is not always the case, and then they come after being pharmacologically mistreated themselves. Stomatologists must constantly explain, without tiring, that this action can have great consequences, cause complications and mask diseases, cause drug resistance, suffer from adverse reactions, allergies and poisoning, and dependence on drugs that can put health at risk and even cause death [14,15].

### Conclusion

The main risks due to incorrect prescription of medications in dentistry were described in the present work, where the cardiovascular, hepatic, renal and hematological allergic types were highlighted.

### Acknowledgements

To my wife for all her unconditional professional and personal support.

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