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# Major functions and importance of dental surgeons in the hospital environment and intensive care units: a concise systematic review

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## Abstract

**Introduction:** Contemporary dental care must be comprehensive, aimed not only at dental treatment but also at assessing the patient's health status. In this sense, hospital dentistry is gaining importance in the multidisciplinary health team, which is essential for the therapy and quality of life of hospitalized patients. **Objective:** A systematic review was carried out to highlight the main functions and importance of the dental surgeon in the hospital environment and intensive care units. **Methods:** The PRISMA Platform systematic review rules were followed. The search was carried out from January to February 2024 in the Scopus, PubMed, Science Direct, Scielo, and Google Scholar databases. The quality of the studies was based on the GRADE instrument and the risk of bias was analyzed according to the Cochrane instrument. **Results and Conclusion:** A total of 89 articles were found, 45 articles were evaluated in full and 15 were included and developed in the present systematic review study. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 25 studies with a high risk of bias and 31 studies that did not meet GRADE and AMSTAR2. Most studies did not show homogeneity in their results, with $X^2$=75.8%>50%. It was concluded that it is necessary to train and qualify the entire hospital team and the dental surgeon so that oral health is offered to patients, as well as knowing the impact caused by oral problems on the systemic health of patients and implementing specific protocols on the subject in all aspects. The dentist must promote the general health of the hospitalized individual, based on interdisciplinary planning developed together with other health professionals, as well as assess the patient's main needs and contribute to the quality of life of these individuals. According to the literature consulted, we can conclude how important the role of the dentist is as an integral part of the multidisciplinary healthcare team in ICU, as their presence could minimize such problems in hospitalized patients. Its insertion in hospitals would contribute to the maintenance of the patient's oral and general health, as well as the use of appropriate procedures during their hospitalization.

**Keywords:** Hospital Dentistry. Intensive Care Unit. Dental surgeon.

## Introduction

Contemporary dental care must be comprehensive, aimed not only at dental treatment but also at assessing the patient's health status. Dentistry is of paramount importance in preventive actions, as well as in the elimination of inflammatory, infectious, and painful symptomatological processes that may contribute to the loss of hospitalized patients [1]. It is associated with systemic conditions in hospital environments and overcomes the barriers and prejudices faced by those involved in this specific type of health service. In this sense, hospital dentistry has been gaining importance in the multidisciplinary health team, which is essential for

the therapy and quality of life of hospitalized patients [1-3].

It is possible to notice the growth in the number of patients requiring dental procedures in hospital environments, a fact that requires the effective presence of the dentist in multidisciplinary activities and favors an important review of professional opportunities and areas of activity [4].

Hospital dentistry can be defined as a practice that aims to take care of oral changes that require multidisciplinary team procedures, work with health professionals involved in the treatment, and a comprehensive approach to the patient. For several years, dentistry has been focused especially on clinical dental care. However, with the advancement of technology and consequently the computerization of all health sectors and the need for joint care with other health professionals [4,5].

Pain relief and the adequacy of oral conditions should be considered a priority for the dentist. However, the effective participation of dental surgeons is not a reality in the hospital environment in Brazil and their work is still very limited as they are not part of the hospital. The multidisciplinary patient care team needs to inform other members of the hospital staff about how the dentist can contribute to improving the quality of life and systemic conditions of hospitalized patients [6,7].

Given this, the present study carried out a systematic review to highlight the main functions and importance of dental surgeons in the hospital environment and intensive care units.

## Methods

### Study Design

The present study followed the international systematic review model, following the rules of PRISMA (preferred reporting items for systematic reviews and meta-analysis). Available at: http://www.prisma-statement.org/?AspxAutoDetectCookieSupport=1. Accessed on: 03/26/2024. The methodological quality standards of AMSTAR-2 (Assessing the methodological quality of systematic reviews) were also followed. Available at: https://amstar.ca/. Accessed on: 03/26/2024.

### Data Sources and Research Strategy

The literary search process was carried out from January to February 2024 and was developed based on Scopus, PubMed, Web of Science, Lilacs, Ebsco, Scielo, and Google Scholar, covering scientific articles from various to the present. The descriptors (MeSH Terms) were used: *"Hospital Dentistry. Intensive Care Unit. Dental surgeon"* and using the Boolean "and" between the MeSH terms and "or" between historical discoveries.

### Study Quality and Risk of Bias

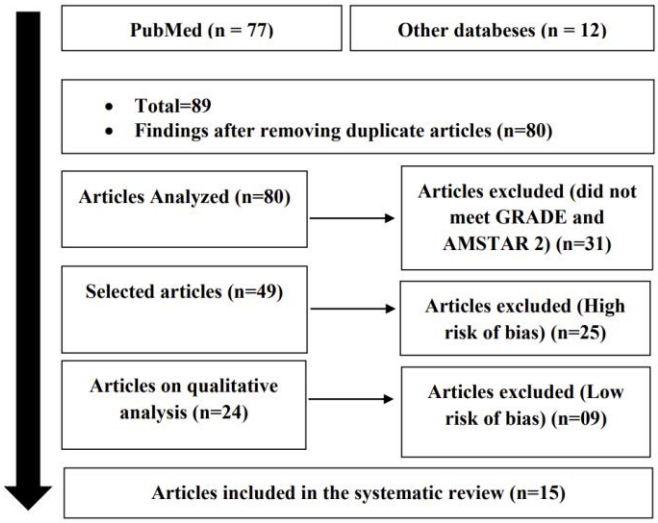
Quality was classified as high, moderate, low, or very low in terms of risk of bias, clarity of comparisons, precision, and consistency of analyses. The most evident emphasis was on systematic review articles or meta-analyses of randomized clinical trials, followed by randomized clinical trials. The low quality of evidence was attributed to case reports, editorials, and brief communications, according to the GRADE instrument. The risk of bias was analyzed according to the Cochrane instrument by analyzing the Funnel Plot graph (Sample size versus Effect size), using the Cohen test (d).

## Results and Discussion

### Summary of Findings

A total of 89 articles were found that were subjected to eligibility analysis, with 15 final studies being selected to compose the results of this systematic review. The studies listed were of medium to high quality (Figure 1), considering the level of scientific evidence of studies such as meta-analysis, consensus, randomized clinical, prospective, and observational. The biases did not compromise the scientific basis of the studies. According to the GRADE instrument, most studies showed homogeneity in their results, with $X^2$=75.8%>50%. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 25 studies with a high risk of bias and 31 studies that did not meet GRADE and AMSTAR-2.

Figure 1. The article selection process by the level of methodological and publication quality.

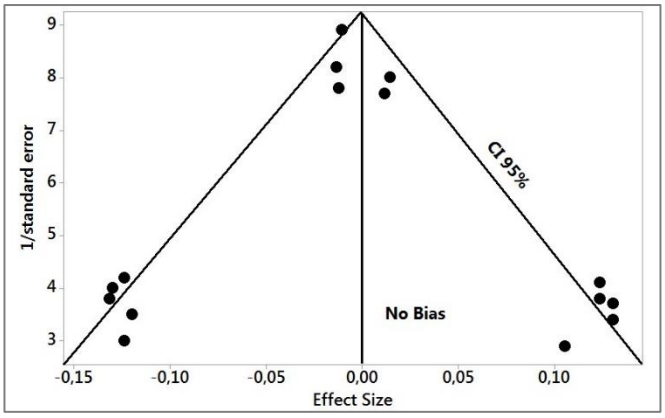



Source: Own authorship.

Figure 2 presents the results of the risk of bias of the studies using the Funnel Plot, showing the calculation of the Effect Size (Magnitude of the difference) using the Cohen Test (d). Precision (sample

size) was determined indirectly by the inverse of the standard error (1/Standard Error). This graph had a symmetrical behavior, not suggesting a significant risk of bias, both between studies with a small sample size (lower precision) that are shown at the bottom of the graph and in studies with a large sample size that are presented at the top.

Figure 2. The symmetric funnel plot suggests no risk of bias among the small sample size studies that are shown at the bottom of the graph. High confidence and high recommendation studies are shown above the graph (n=15 studies).




Source: Own authorship.

## Major Findings - Hospital Dentistry and Intensive Care Unit

The development of hospital dentistry in America and Europe began much earlier, in the 19th century, with the efforts of researchers Simon Hullihen and James Garretson. Great efforts were being made to obtain recognition. Later, it would have the support of the American Dental Association and the respect of the medical community. Dental practice in hospitals requires professional preparation in aspects related to the care of the oral cavity, as well as a better commitment to comprehensive and humanized care, based on actions aimed at providing biopsychosocial well-being to patients [1,8].

Hospital dental activities are generally aimed at caring for patients with serious systemic diseases, uncooperative physically disabled people, and neurologically compromised individuals. Dental procedures can be carried out safely and comfortably, posing less risk to patients, dental surgeons, and healthcare teams. Requests for complementary exams allow for better diagnosis and monitoring, as well as planning with other professionals. These are advantages that dental surgeons can have when performing their clinical activities in the hospital [8,9].

An intensive care unit (ICU), also known as an intensive care unit intensive care unit or intensive care unit, is a special department of a hospital or healthcare facility that provides intensive treatment. Intensive care units care for patients with serious and life-threatening illnesses and injuries, who require constant care, monitoring, and support from specialized equipment and medications to ensure normal bodily functions. They are staffed by highly trained doctors and nurses who specialize in caring for critically ill patients [10]. ICU are also differentiated from regular hospital wards by a higher staff-topatient ratio and access to advanced medical features and equipment that are not routinely available elsewhere. Common conditions that are treated within ICU include acute (or adult) respiratory distress syndrome (ARDS), trauma, multiple organ failure, and sepsis [11,12].

Dental surgeons can act as healthcare consultants and service providers in hospitals through the implementation of training, qualifications, preventive guidelines, and assisted practice instructions, which must be followed by qualitative assessment of these behaviors to improve services and target specific needs [2,13].

The assessment of oral condition and the need for dental treatment in hospitalized patients requires that monitoring be carried out by a qualified dental surgeon with hospital experience. Preventive clinical procedures, as well as procedures to assess oral health, oral lesions, and other oral changes that may pose some risk or discomfort to patients, are part of the responsibility of the dentist [13,14].

The presence of bacterial plaque in the oral cavity can influence planned medical interventions due to microorganisms found in the mouth. The virulence factors of these microorganisms contribute to the accumulation of bacteria associated with nosocomial pneumonia, ventilator-associated pneumonia, and bacterial endocarditis, which are the most common systemic and infectious diseases related to the hospital dental context [11].

Patients admitted to the ICU have lower quality oral hygiene and a higher prevalence of colonization of respiratory pathogens in their teeth and oral mucosa, as this favors the growth of a biofilm containing microorganisms capable of colonizing the lungs and upper airways, causing what we call nosocomial or nosocomial pneumonia, being one of the main infections that affect these patients [15].

In this aspect, the incorporation of the dentist into the hospital team contributes to the prevention of infections, reducing hospitalization time and the use of medication. The functions of the dental surgeon in the ICU are to restore and maintain oral health, prevent infections and oral injuries, perform emergency procedures in response to trauma, prevent the

worsening of the systemic condition and the emergence of hospital infection, and intervene with curative procedures promoting health and comfort to the patient [2-4].

Several authors argue that it is important to include the dentist in the multidisciplinary team to reduce the worsening of the patient's health, the length of hospital stay, and the cost of treatment. The literature shows that compromised oral health due to infections such as cavities, gingivitis, and periodontal disease, can interfere with the systemic conditions of patients, contributing to an increase in the time and cost of hospital treatment, in addition to directly affecting the quality of life of patients [2-8].

The evolution of dentistry has led to a better understanding of the study of oral diseases and the systemic effects of these pathologies are increasingly being studied. Scientific research relates oral infections to other systemic pathologies, considering them to have the potential to increase or contribute to the risk of other diseases, making the presence of a Dental Surgeon in the ICU essential [10-13].

Furthermore, dentistry professionals must join forces in search of positive results, always focusing on the patient's overall health. Interdisciplinarity must direct its action in ICU so that prevention is as relevant as a cure, but more than that, it is necessary that hospitals are technically structured and that dentists develop adequate training, aware of the important role they have and on how to perform it with excellence [14,15].

The transformations that have been occurring in contemporary societies in recent decades have required reconfigurations in the understanding of the health-disease process, which extends to the way professionals act, demanding the need for interactions to favor the success of health care procedures. It is in this context that hospital dentistry is inserted, which is defined as a set of preventive, diagnostic, therapeutic, and palliative actions in oral health, carried out in hospital institutions and inserted in the context of the work of the multidisciplinary team. The treatment of hospitalized patients, in a comprehensive approach, requires the work of a multidisciplinary team, and this approach favors the improvement of the patient's clinical condition [1,2].

Given this, the role of the dental surgeon in a hospital environment has become increasingly required due to the understanding that there is a relationship between poor oral condition and compromised systemic health. It must be emphasized that to work in a hospital, the dental surgeon must not only be an excellent general practitioner, but, above all, have a thorough knowledge of the study of clinical medicine so that one can have an understanding of general diseases of the body and their etiopathogenesis, as well as diagnostic mechanisms and therapies to be applied [3,4].

Specific training is necessary, through basic requirements to be met, which are the study of diseases and their treatments, and adaptation to work with a multidisciplinary team through internships and training courses for working in hospitals. Some paradigms must be changed, seeking greater dissemination of the role of the dental surgeon in hospitals and the bodies responsible for this area, dedicating adequate supervision to verify whether this action is being followed and under what conditions professionals carry out their oral hygiene activities. [5,7].

## Conclusion

It was concluded that it is necessary to train and qualify the entire hospital team and the dental surgeon so that oral health is offered to patients, as well as knowing the impact caused by oral problems on the systemic health of patients and implementing specific protocols on the subject in all aspects. The dentist must promote the general health of the hospitalized individual, based on interdisciplinary planning developed together with other health professionals, as well as assess the patient's main needs and contribute to the quality of life of these individuals. According to the literature consulted, we can conclude how important the role of the dentist is as an integral part of the multidisciplinary healthcare team in ICUs, as their presence could minimize such problems in hospitalized patients. Its insertion in hospitals would contribute to the maintenance of the patient's oral and general health, as well as the use of appropriate procedures during their hospitalization.

## CRediT

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The authors declare no conflict of interest.

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