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Review Article

# Navigating challenges in dental care for medically compromised patients

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ABSTRACT

This review article delves into the intricate landscape of dental care for medically compromised patients, offering a comprehensive exploration of challenges faced by both clinicians and patients in this specialized realm. As the prevalence of chronic medical conditions continues to rise, the intersection between systemic health and oral well-being becomes increasingly significant. This review synthesizes current literature to provide a thorough analysis of the multifaceted issues encountered when treating individuals with complex medical histories. It navigates through the challenges faced by dental practitioners in diagnosis, treatment planning, and execution of dental procedures in medically compromised individuals. It addresses the intricacies of medication management, anaesthesia considerations, and the potential complications associated with common dental interventions. Special attention is given to the importance of interdisciplinary collaboration between dental and medical professionals in optimizing patient outcomes.

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## 1. Introduction

In 2019, global life expectancy reached approximately 72 years, reflecting a significant improvement over decades and mirrored in childhood survival rates. The aging population has led to a surge in individuals with long-term conditions, with one in three adults now living with more than one chronic disease.[1] Evidence indicates that 40% to 52% of patients seeking dental care have multiple systemic conditions, a prevalence that rises with age. The medical comorbidities often result in patients taking multiple medications, impacting their periodontal management.[2]

Patients treated in dental schools commonly take medications such as antihypertensives, painkillers, antidepressants, antidyslipidemic agents, and antiplatelet drugs. This necessitates careful consideration of potential pharmacologic interactions during periodontal procedures.[3] Beyond age-related and polypharmacy-related systemic issues, the increased survival of individuals with congenital diseases, including those with rare disorders, has created a growing demand for periodontal treatment. However, complications may arise due to hemorrhagic diatheses, immunodeficiencies, and metabolic alterations.[4]

This narrative review provides a comprehensive overview of potential complications and treatment errors in medically compromised patients undergoing dental treatment. Specific risk reduction strategies for these

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patients are also discussed, emphasizing the need for tailored approaches in dental care for diverse patient populations.

### *1.1. Risk assessment framework and appropriate treatment modifications*

When planning treatment for periodontal therapy in patients who are medically compromised, it is important to consider additional factors to provide holistic care. In addition to clinical and radio-graphic examination, a thorough medical, social, and dental history will enable a comprehensive risk assessment (Table 1). This will ensure that appropriate modifications can be implemented prior to commencement of dental therapy, thereby reducing complications and treatment errors. The ACCESS mnemonic is a systematic approach to treatment modification, considering six domains that address different aspects of care.[5,6]

Access, Communication, Consent, Education, Surgery, Spread of infection.

**Table 1:** Examples of potential medical, social, and dental risks Top of Form

| Category | Potential risks |
|---|---|
| Medical | Aspiration, Bleeding, Delayed healing, Local infection, Infective endocarditis, Hypoglycemia, Trismus |
| Social | Ability to attend appointments, Timing of appointments, Communication aids, Lack of capacity to consent to periodontal therapy, Reduced mobility. |
| Dental | Periodontal disease, Reduced cooperation, Reduced manual dexterity |

### *1.2. Prevention and management of complications and treatment errors in dental treatment*

Complications and treatment errors may occur when providing dental treatment in patients who are medically compromised. These will be presented in relation to pain control, bleeding, infection, and wound healing**.**

#### *1.2.1. Pain control and analgesia*

Effective pain control is a critical aspect of ensuring the success of invasive dental procedures. Various factors, including medical conditions, operator skills, and the availability of equipment, play a role in determining the most suitable approach.[7] for instance, a computer-controlled local anesthetic delivery system can be a valuable tool in achieving precise pain management. When dealing with patients, especially those with specific medical conditions like hypermobile Ehlers-Danlos Syndrome, a systematic approach to selecting the type of local anesthetic is crucial. Resistance to local anesthetic is a concern, and a retrospective survey indicated varying success rates with different anesthetics. For instance, articaine and bupivacaine showed higher success rates in individuals with Ehlers-Danlos Syndrome.[8–10] Allergies to local anesthetics are rare, but when reported, further investigation is necessary. Vasovagal syncope is a more commonly reported reaction, often mistaken for an allergy. Care must be taken in patients with severe cardiac conditions, as pain control is essential to minimize stress on the myocardium. The choice of anesthetic and its administration should be done cautiously, with attention to potential cardiovascular toxicity.[11]

Patients with a history of long-term opioid use may exhibit increased tolerance to local anesthetics, necessitating higher doses. Modification of anesthetic techniques may also be necessary for patients with specific medical conditions, such as bleeding disorders or trismus. Preoperative assessments and tests are crucial in ensuring the safety and efficacy of anesthetic procedures.[12]

In cases of needle phobia, computer-controlled local anesthetic delivery systems can be a valuable alternative, providing reduced pain perception and increased efficacy. The choice of anesthetic solutions and techniques should be adapted to the individual patient's needs and medical history.[13]

In some conditions, like epidermolysis bullosa, where mucosa surfaces are fragile, special attention is needed to avoid complications. Postoperative care instructions become crucial, including draining blisters if they occur and advising patients to avoid traumatizing the mucosa.

When achieving adequate local anesthesia becomes challenging, alternative modalities such as conscious sedation or general anesthesia may need to be considered. Preoperative assessments are essential to evaluate the suitability of medically compromised patients for these procedures.

Postoperative pain is a common concern in periodontal treatment, with factors like age, patient anxiety, and the type of procedure influencing its intensity and duration. Acetaminophen and nonsteroidal anti-inflammatory drugs are commonly used to manage postoperative pain, but caution is required in patients with specific systemic diseases.[14]

#### *1.2.2. Bleeding: Top of Form*

Effective management of bleeding risks is crucial in perioperative and postoperative periods, particularly in the context of dental surgery. This encompasses both congenital and acquired bleeding conditions, each necessitating specific considerations and modifications in treatment approaches to mitigate potential complications.

In tailoring dental procedures to individual patients, the risk of bleeding must be carefully assessed, taking into account the medical condition, type of dental procedure, and the operator's experience. Collaboration with the patient's medical team is essential to ascertain the severity of their

condition and establish an appropriate management plan. For those at a severe risk of bleeding, especially those undergoing chemotherapy, secondary care settings with onsite medical support may be more suitable for invasive periodontal therapy. [15]

Timing of appointments is crucial, with procedures at higher risk of bleeding ideally scheduled earlier in the day and week. This consideration aligns with medical management plans, accommodating factors like the timing of scheduled doses for anticoagulants. For patients with a high risk of bleeding on dual antiplatelet therapy, some guidelines recommend suspending one antiplatelet agent before the procedure while maintaining aspirin administration. [16]

Preoperative assessments, including blood tests, are essential to gauge the underlying medical condition's stability. The international normalized ratio (INR) is a key parameter for patients on warfarin, and studies suggest that nonsurgical periodontal therapy can be safely performed when INR is <4. Special attention should be given to patients with pharmacotherapy affecting blood counts, necessitating blood tests close to the procedure. [17]

Patients with thrombocytopenia may require additional hematological support, and the threshold for platelet counts is typically set at $\geq 50 \times 10^{\wedge}9$/L for invasive dental procedures. Prophylactic platelet transfusions might be indicated based on individual patient factors.

Education plays a vital role, with patients informed of potential minor bleeding related to periodontal therapy. Oral hygiene measures should be advised with consideration for the patient's bleeding risk, ensuring they understand the importance of maintaining good oral health. [18]

In terms of procedural considerations, gentle handling of oral mucosa, instruments, and equipment is essential. Local anesthetic selection and technique should be carefully chosen, and factor replacement may be necessary for patients with hemophilia. Surgical techniques, especially in high-risk procedures like extractions and periodontal surgery, should be approached cautiously, and postoperative observations are crucial to ensuring hemostasis.

In cases of postoperative bleeding, local measures such as compression and topical coagulating agents may be employed. Tranexamic acid mouthwash could be considered for managing postoperative bleeding, with successful outcomes reported in patients taking warfarin.

## 2. Top of Form

### *2.1. Infection*

The management of infections following dentistry in medically compromised patients is a critical aspect of dental care, particularly in the context of immunosuppression, infective endocarditis, aspiration pneumonia, blood-borne viruses, and wound healing. Immunosuppressed patients face an elevated risk of infection after invasive periodontal therapy, and the causes of immunosuppression can be congenital or acquired. The timing of dental appointments for these patients should be carefully considered based on the cause, severity, and expected duration of immunosuppression. For instance, those undergoing chemotherapy may experience bone marrow suppression, leading to low white cell count and neutrophils, predisposing them to infections. The treatment window should be determined in consultation with the oncology team. [19]

Patients who have undergone solid organ transplantation, receiving long-term immunosuppressants, should delay elective periodontal therapy for 3-6 months post-transplant. Preoperative investigations and close collaboration with the patient's physician are necessary to minimize infection risks in immunosuppressed individuals.

Patients requiring regular blood transfusions, such as those with thalassemia major, should schedule dental visits soon after routine transfusions. Preoperative investigations, including blood counts and liver function tests, are essential to assess the severity of immunosuppression and determine the appropriateness of the procedure. [20]

In cases of neutropenia, where the neutrophil count is $<1 \times 10^{\wedge}9$ /L, invasive periodontal therapy should be postponed due to an increased risk of infection. Prophylactic antibiotics may be indicated for immunosuppressed patients, such as those who have undergone splenectomy. [21]

The use of prophylactic antibiotics for dental procedures in immunosuppressed patients remains a topic of debate. While some recommend antibiotic coverage for specific patient cohorts, others, like the British Society for Antimicrobial Chemotherapy, do not routinely recommend it. Decision-making should involve consultation with the medical team, considering additional medical factors.

Patients on corticosteroids, especially those with Addison's disease, are at an increased risk of adrenal crisis during stress. Steroid cover is recommended for patients on higher doses of corticosteroids undergoing invasive periodontal therapy or treatment under general anesthesia. [22]

Advances in targeted anticancer therapies, including monoclonal antibodies, have expanded indications for patients with various medical conditions. These therapies can cause immunosuppression, delayed wound healing, and medication-related osteonecrosis of the jaw.

Patients with susceptible cardiac conditions face an increased risk of infective endocarditis following invasive dental procedures. Although antibiotic prophylaxis is not routinely recommended, high-risk patients may need to consult with their cardiologists or surgeons to determine its necessity. [23]

Dysphagia increases the risk of aspiration, potentially leading to pneumonia. Good oral hygiene practices, including toothbrushing and denture care, play a crucial role

in reducing the risk of aspiration pneumonia. During dental care, strategies such as maintaining an upright position and using gauze traps can help minimize aspiration risk.

Patients who received inactivated blood products may be at risk of transfusion-transmitted infections. Current blood product procedures with virus deactivation have reduced the prevalence of such infections. Standard infection prevention and control procedures, including careful history taking and immunization of the dental team, should be in place to minimize the risk of transmission. Periodontal treatment is effective and safe in patients with virologically controlled HIV infection when appropriate measures are followed.[24]

Wound healing challenges in dental therapy are evident in medically compromised patients. For those with poorly controlled diabetes mellitus, impaired immunity heightens the risk of delayed healing. Assessing the severity of conditions, especially diabetes, is crucial before invasive periodontal procedures. Blood glucose levels and HbA1c offer insights, enabling safe management. While routine prophylactic antibiotics lack sufficient support for mitigating healing risks in diabetes patients, close monitoring and limited procedural sites are advisable.[25] Conditions like osteoradionecrosis in patients with a history of head and neck radiotherapy necessitate careful dental assessment pre-therapy. Medications, including corticosteroids, biologics, and antirheumatic drugs, pose challenges to wound healing, warranting preventive dental assessments and conservative management for osteonecrosis. Strict follow-up protocols and regular recall intervals are essential for medically compromised patients to maintain oral health and minimize complications post-invasive periodontal procedures.[26]

## 3. Conclusion

Complications in medicine are unforeseen issues arising from procedures, treatments, or illnesses, impacting disease prognosis. Errors are inherent in professional practice, affecting patients' health. Both dentists and physicians are susceptible to errors that influence patient outcomes. Adverse events result from treatment, while complications stem from the disease process. This review outlines common complications in systemic comorbidities during dental therapy, offering a risk assessment framework for preoperative and intraoperative phases. The aim is to assist colleagues in preventing and minimizing treatment complications.

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## 5. Conflict of Interest

None.

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