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Prosthodontics applications for medically compromised patients

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Partial Fulfillment for the Bachelor of Dental Surgery

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Certification of the Supervisor

I certify that this project entitled " **Prosthodontics applications for medically compromised patients** " was prepared by the fifth-year student **Karrar Mahmou Mohammed** under my supervision at the College of Dentistry/University of Baghdad in partial fulfilment of the graduation requirements for the Bachelor Degree in Dentistry.

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DEDICATION

All my success as well as everything I do, I'm honored to dedicate it to my parents, the two people who gave me the values and paved the path for my journey in life. A special feeling of gratitude to my loving parents, whose words of encouragement

My father, who pushed me to continue for the better and accompanied me throughout this difficult period and who has always been my inspiration in my work.

My mother, my mentor and role model for the love, and for her generosity in love, knowledge, wisdom and life lessons.

My sisters and my brothers have never left my side and are very special.

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I also dedicate this dissertation to my many friends and family who have supported me throughout the process. I will always appreciate all they have done. for their presence, warmth and endless support.

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INTRODUCTION:

Older adults with chronic medical conditions are increasing in number as dental patients. So, a wide range of knowledge regarding medical conditions and drugs considerations is deemed necessary in dentists. Various chronic disorders and their treatments require alterations in the dental treatment. Serious clinical consequences may result due to failure of appropriate treatment modifications. Thorough evaluation followed by risk assessment should be done to determine whether a planned procedure can be safely implicated for successful dental management of a medically compromised patient while performing dental treatments. Risks and benefits should be examined for a dental treatment, and benefits overweigh the risk of medical complications **(Little et al., 2017)**.

Dental patients vary in their systemic health and prevalence of systemic conditions that might affect dental treatment appears to be high. Surveys indicate that 25% of persons between ages 35 and 74 years are edentulous and require a high amount/degree of prosthetic care. **(Little et al., 2017)** . Oral health and systemic health are inter-related. This is particularly more apparent when the patient seeking oral health care presents with some systemic disorder. An evaluation and consideration of overall health status of patients prior to any dental procedure forms an essential part of comprehensive health care system. To avoid complications it is necessary to identify such systemic conditions that have an impact on, and can be impacted by dental treatment. **(Little et al., 2017)**

In this research , some of the systemic diseases that commonly affect the aged individuals are reviewed. General considerations of these systemic disorders along with the prosthodontic management modifications needed for providing adequate oral health care will also be discussed

Aims of the review:

1. to highlights the prosthodontic management of patients with some common systemic disorders.
2. To avoid complications as a result of wrong handling with patients with systemic diseases when performing dental prostheses

1.1 Overview of medical conditions and their impact on oral health

Oral health refers to the health of the teeth, gums, and the entire oral-facial system that allows us to smile, speak, and chew (**Health and Committee, 2016**). Some of the most common diseases that impact oral health include cavities (tooth decay), gum (periodontal) disease, and oral cancer (**Health and Committee, 2016**). More than 40% of adults report having felt pain in their mouth within the last year, and more than 80% of people will have had at least one cavity by age 34 (**Health and Committee, 2016**). Oral diseases cause pain and disability for millions of Americans and cost taxpayers billions of dollars. (**Ajay Mootha et al., 2018**)

Oral diseases are among the most common noncommunicable diseases worldwide, affecting an estimated 3.5 billion people (**Petersen and Kwan, 2011**). Oral diseases encompass a range of diseases and conditions that include dental caries, periodontal (gum) disease, tooth loss, oral cancer, oro-dental trauma, noma, and birth defects such as cleft lip and palate (**Petersen and Kwan, 2011**). Oral health varies over the life course from early life to old age, is integral to general health, and supports individuals in participating in society and achieving their potential (**Petersen and Kwan, 2011**). When oral health is compromised by disease or injury, general health is also affected. The pain and discomfort associated with oral diseases make concentrating difficult, cause discomfort and embarrassment, and affect a person's self-esteem, school performance, and attendance at work or school (**Petersen and Kwan, 2011**).

1.2 Prosthodontic treatment planning for medically compromised patients

1.2.1 Infective Endocarditis

The American Heart Association (AHA) has issued guidelines for the prevention of IE in patients undergoing dental procedures. According to these guidelines, prophylactic antibiotic therapy is recommended for patients with certain cardiac conditions, including those with prosthetic heart valves, a history of IE, and certain types of congenital heart disease. **(Wilson et al., 2007).**

Prosthodontists should carefully evaluate patients' medical histories and cardiac status before planning dental treatment. They should also follow the AHA guidelines and prescribe prophylactic antibiotics when indicated. **(Resnik, 2020).**

In addition, prosthodontists should educate patients on the importance of good oral hygiene and regular dental visits to prevent dental infections that can lead to IE. Patients should also be advised to seek prompt treatment for dental infections, such as tooth decay or gum disease. **(Wilson et al., 2007).**

1.2.2 hypertension , ischemic Heart Disease , Cardiac Arrhythmias

In general before initiating treatment of patient with cardiovascular disease, prosthodontists should obtain a detailed medical history from the patient, including information on the type and severity of the disease, the patient's current medications and management plan, and any history of cardiac events **(Little et al., 2017).**

During dental procedures, prosthodontists should take measures to minimize stress and anxiety, which can increase the risk of increase blood pressure and angina and trigger arrhythmias and other cardiac events. This may involve creating a calm and relaxing environment, using sedation techniques if necessary, and scheduling longer appointments to reduce the patient's overall stress (**Little et al., 2017**) .

Prosthodontists should also use appropriate pain control techniques to minimize pain and discomfort during treatment, as pain can increase blood pressure and the workload of the heart (**Little et al., 2017**)

Prosthodontists should also provide advice on lifestyle modifications that can help patients manage their hypertension, such as regular exercise, a healthy diet, and avoiding smoking and excessive alcohol consumption. (**Little et al., 2017**).

1.2.3 Pulmonary Disease

Prosthodontics management of patients with pulmonary disease involves careful consideration of the patient's medical condition and the potential impact of dental treatment on their respiratory function (**Phoenix et al., 2003**). Here are some key considerations:

Medical history: Patients with pulmonary disease may have a history of asthma, chronic obstructive pulmonary disease (COPD), bronchitis, or emphysema. These conditions can affect their ability to breathe and tolerate dental procedures (**Phoenix et al., 2003**).

Breathing difficulties: Patients with pulmonary disease may have difficulty breathing, especially during periods of stress or exertion. Dental procedures can cause stress and anxiety, leading to shortness of breath and other respiratory symptoms. **(Lockhart and Schmidtke, 1994).**

Infection control: Patients with pulmonary disease are at a higher risk of developing respiratory infections. Therefore, it is important to follow strict infection control procedures, such as proper sterilization of dental instruments and the use of masks and gloves **(Phoenix et al., 2003).**

Positioning: Patients with pulmonary disease may require special positioning during dental procedures to help them breathe more easily. For example, sitting upright or using a reclining dental chair can help improve their breathing **(Phoenix et al., 2003).**

Pre-medication: In some cases, patients with pulmonary disease may require pre-medication with bronchodilators or other medications to help manage their respiratory symptoms during dental treatment **(Little et al., 2017).**

Some dental materials, such as acrylics and certain bonding agents, can cause respiratory irritation and exacerbate pulmonary symptoms. Therefore, it is important to choose materials that are biocompatible and minimize any potential respiratory irritants **(Lockhart and Schmidtke, 1994).**

Patients with pulmonary disease may be taking medications such as bronchodilators, corticosteroids, and oxygen therapy. These medications can have

side effects and interactions with dental anesthetics and other drugs used during dental treatment **(Phoenix et al., 2003)**.

1.2.4 patients with Liver Disease

Prosthodontics management of patients with liver disease requires a careful and individualized approach that takes into account the patient's overall health, medications, and potential complications associated with liver disease **(Ghimire et al., 2022)**.

Here are some key considerations:

Medical history: Patients with liver disease may have a history of jaundice, cirrhosis, or other liver-related complications. It is important to obtain a detailed medical history and review any existing medical treatment plans.**(Ghimire et al., 2022)**.

Evaluate oral health: Patients with liver disease may have a higher risk of oral health problems, such as periodontal disease, dry mouth, and oral thrush. Prosthodontists should evaluate the patient's oral health and develop a treatment plan that takes into account any existing oral health problems. **(Ghimire et al., 2022)**.

Plan treatment carefully: Patients with liver disease may have a higher risk of bleeding and infections associated with oral surgery or implant placement. Prosthodontists should plan treatment carefully and take steps to mitigate these risks, such as avoiding elective surgery or using appropriate antibiotic prophylaxis. **(Ghimire et al., 2022)**.

Monitor oral health: Patients with liver disease should be monitored closely for signs of oral health problems, such as gum disease or infections. Prosthodontists should encourage regular dental check-ups and cleanings to detect any potential issues early on. **(Ghimire et al., 2022).**

Nutritional counseling: Patients with liver disease may have specific nutritional requirements that need to be taken into account in their prosthodontic treatment plan. Prosthodontists should work with the patient's hepatologist or registered dietitian to ensure that the patient's nutritional needs are met. **(Ghimire et al., 2022).**

Patients with liver disease may be taking medications that can affect their oral health, such as antibiotics or immunosuppressive drugs. Prosthodontists should consult with the patient's hepatologist or primary care physician to ensure that any necessary medication adjustments are made to minimize potential oral health complications. **(Ghimire et al., 2022).**

1.2.5 patients with Gastrointestinal Disease

Prosthodontics management of patients with gastrointestinal (GI) disease requires a comprehensive approach that takes into account the patient's overall health, medications, and potential complications associated with GI disease **(Van Roekel, 2003)**. Here are some key considerations:

Medical history: Patients with GI disease may have a history of acid reflux,

inflammatory bowel disease, or other GI-related complications. It is important to obtain a detailed medical history and review any existing medical treatment plans **(Stavreva and Spasova, 2019)**.

Evaluate oral health: Patients with GI disease may have a higher risk of oral health problems, such as dry mouth, enamel erosion, and oral infections. Prosthodontists should evaluate the patient's oral health and develop a treatment plan that takes into account any existing oral health problems **(Palmer, 2003)**.

Plan treatment carefully: Patients with GI disease may have a higher risk of nausea, vomiting, or other complications associated with oral surgery or implant placement. Prosthodontists should plan treatment carefully and take steps to mitigate these risks, such as scheduling procedures at times when the patient is most comfortable or using appropriate antiemetic medications **(Van Roekel, 2003)**.

Monitor oral health: Patients with GI disease should be monitored closely for signs of oral health problems, such as gum disease or infections. Prosthodontists should encourage regular dental check-ups and cleanings to detect any potential issues early **(Palmer, 2003)**.

Nutritional counseling: Patients with GI disease may have specific nutritional requirements that need to be taken into account in their prosthodontic treatment plan. Prosthodontists should work with the patient's gastroenterologist or registered dietitian to ensure that the patient's nutritional needs are met **(Van Roekel, 2003)**. Patients with GI disease may be taking medications that can affect their oral health,

such as proton pump inhibitors or immunosuppressive drugs. Prosthodontists should consult with the patient's gastroenterologist or primary care physician to ensure that any necessary medication adjustments are made to minimize potential oral health complications (**Stavreva and Spasova, 2019**).

1.2.6 patients with Chronic Kidney Disease and Dialysis

Prosthodontics management of patients with chronic kidney disease (CKD) and dialysis requires a comprehensive approach that takes into account the patient's overall health, medications, and potential complications associated with CKD and dialysis (**Vesterinen et al., 2007**). Here are some key considerations:

Medical history: Patients with CKD and dialysis may have a history of hypertension, anemia, or other related complications. It is important to obtain a detailed medical history and review any existing medical treatment plans (**Vesterinen et al., 2007**).

Evaluate oral health: Patients with CKD and dialysis may have a higher risk of oral health problems, such as dry mouth, gum disease, and oral infections. Prosthodontists should evaluate the patient's oral health and develop a treatment plan that takes into account any existing oral health **problems (Vesterinen et al., 2007)**.

Plan treatment carefully: Patients with CKD and dialysis may have a higher risk of infection associated with oral surgery or implant placement. Prosthodontists should plan treatment carefully and take steps to mitigate these risks, such as avoiding elective surgery or using appropriate antibiotic prophylaxis (**Vesterinen et al.,**

2007).

Monitor oral health: Patients with CKD and dialysis should be monitored closely for signs of oral health problems, such as gum disease or infections. Prosthodontists should encourage regular dental check-ups and cleanings to detect any potential issues early on (**Vesterinen et al., 2007**).

Nutritional counseling: Patients with CKD and dialysis may have specific nutritional requirements that need to be taken into account in their prosthodontic treatment plan. Prosthodontists should work with the patient's nephrologist or registered dietitian to ensure that the patient's nutritional needs are met (**Vesterinen et al., 2007**).

Consider dialysis schedule: Patients on dialysis may require treatment during their regular dialysis schedule. Prosthodontists should work with the patient and their dialysis team to schedule appointments at a convenient time that does not interfere with their dialysis schedule. (**Vesterinen et al., 2007**).

Patients with CKD and dialysis may be taking medications that can affect their oral health, such as phosphate binders or erythropoietin stimulating agents. Prosthodontists should consult with the patient's nephrologist or primary care physician to ensure that any necessary medication adjustments are made to minimize potential oral health complications (**Vesterinen et al., 2007**).

1.2.7 Endocrine and Metabolic Disease

1.2.7.1 Diabetes Mellitus

Prosthodontics management of patients with diabetes mellitus (DM) requires a comprehensive approach that takes into account the patient's overall health, medications, and potential complications associated with DM (**Kansal and Goyal, 2013**). Here are some key considerations:

Medical history: Patients with DM may have a history of related complications, such as cardiovascular disease or neuropathy. It is important to obtain a detailed medical history and review any existing medical treatment plans . (**Little et al., 2017**).

Evaluate oral health: Patients with DM may have a higher risk of oral health problems, such as gum disease or oral infections. Prosthodontists should evaluate the patient's oral health and develop a treatment plan that takes into account any existing oral health problems. (**Little et al., 2017**).

Plan treatment carefully: Patients with DM may have a higher risk of infection associated with oral surgery or implant placement. Prosthodontists should plan treatment carefully and take steps to mitigate these risks, such as using appropriate antibiotic prophylaxis. (**Little et al., 2017**).

Monitor blood sugar levels: Patients with DM may experience fluctuations in blood sugar levels during prosthodontic treatment. Prosthodontists should work with the patient's endocrinologist or primary care physician to monitor blood sugar levels and adjust treatment as needed. (**Little et al., 2017**).

Nutritional counseling: Patients with DM may have specific nutritional requirements that need to be taken into account in their prosthodontic treatment plan. Prosthodontists should work with the patient's endocrinologist or registered dietitian to ensure that the patient's nutritional needs are met. **(Little et al., 2017).**

Encourage regular dental check-ups and cleanings: Patients with DM should be encouraged to have regular dental check-ups and cleanings to detect any potential oral health problems early on. **(Little et al., 2017).**

Patients with DM may be taking medications that can affect their oral health or interact with prosthodontic treatment. Prosthodontists should consult with the patient's endocrinologist or primary care physician to ensure that any necessary medication adjustments are made to minimize potential oral health complications. **(Little et al., 2017)**

1.2.7.2 Adrenal Insufficiency

Prosthodontics management of patients with adrenal insufficiency requires a careful and individualized approach that takes into account the patient's overall health, medications, and potential complications associated with adrenal insufficiency **(Little et al., 2017)** . Here are some key considerations:

Medical history: Patients with adrenal insufficiency may have a history of related complications, such as low blood pressure or electrolyte imbalances. It is important to obtain a detailed medical history and review any existing medical

treatment plans. **(Little et al., 2017).**

Evaluate oral health: Patients with adrenal insufficiency may have a higher risk of oral health problems, such as gum disease or oral infections. Prosthodontists should evaluate the patient's oral health and develop a treatment plan that takes into account any existing oral health problems. **(Little et al., 2017).**

Plan treatment carefully: Patients with adrenal insufficiency may have a higher risk of infection associated with oral surgery or implant placement. Prosthodontists should plan treatment carefully and take steps to mitigate these risks, such as using appropriate antibiotic prophylaxis. **(Little et al., 2017).**

Monitor blood pressure and electrolyte levels: Patients with adrenal insufficiency may experience fluctuations in blood pressure and electrolyte levels during prosthodontic treatment. Prosthodontists should work with the patient's endocrinologist or primary care physician to monitor these levels and adjust treatment as needed. **(Little et al., 2017).**

Encourage regular dental check-ups and cleanings: Patients with adrenal insufficiency should be encouraged to have regular dental check-ups and cleanings to detect any potential oral health problems early on. **(Little et al., 2017).**

In summary, prosthodontics management of patients with adrenal insufficiency requires a careful and individualized approach that takes into account

the patient's overall health, medications, and potential complications associated with adrenal insufficiency. By working collaboratively with the patient's healthcare team, prosthodontists can develop a treatment plan that promotes good oral health and minimizes potential complications. **(Little et al., 2017).**

Patients with adrenal insufficiency may be taking medications, such as steroids, that can affect their oral health or interact with prosthodontic treatment. Prosthodontists should consult with the patient's endocrinologist or primary care physician to ensure that any necessary medication adjustments are made to minimize potential oral health complications. **(Little et al., 2017).**

1.2.7.3 Thyroid Diseases

Prosthodontics management of patients with thyroid diseases requires a comprehensive approach that takes into account the patient's overall health, medications, and potential complications associated with thyroid disease **(Little et al., 2017)**. Here are some key considerations:

Medical history: Patients with thyroid diseases may have a history of related complications, such as cardiovascular disease or osteoporosis. It is important to obtain a detailed medical history and review any existing medical treatment plans. **(Little et al., 2017).**

Evaluate oral health: Patients with thyroid diseases may have a higher risk of

oral health problems, such as gum disease or dry mouth. Prosthodontists should evaluate the patient's oral health and develop a treatment plan that takes into account any existing oral health problems. **(Little et al., 2017).**

Plan treatment carefully: Patients with thyroid diseases may have a higher risk of infection associated with oral surgery or implant placement. Prosthodontists should plan treatment carefully and take steps to mitigate these risks, such as using appropriate antibiotic prophylaxis. **(Singh, 2015).**

Monitor thyroid hormone levels: Patients with thyroid diseases may experience fluctuations in thyroid hormone levels during prosthodontic treatment. Prosthodontists should work with the patient's endocrinologist or primary care physician to monitor these levels and adjust treatment as needed. **(Little et al., 2017).**

Encourage regular dental check-ups and cleanings: Patients with thyroid diseases should be encouraged to have regular dental check-ups and cleanings to detect any potential oral health problems early on. **(Little et al., 2017).**

1.2.8 patients with Allergy

When managing a patient with allergies in prosthodontics, it is important to take certain precautions to prevent adverse reactions **(Sivakumar et al., 2012).**

Here are some steps that can be taken:

Identify the allergen: The first step is to identify the allergen causing the patient's allergic reaction. This can be done by taking a detailed medical history and performing allergy tests if necessary. **(Sivakumar et al., 2012).**

Take precautions during treatment: During treatment, it is important to take precautions to prevent the patient from being exposed to the allergen. This may include using protective barriers or avoiding certain materials. **(Sivakumar et al., 2012).**

Educate the patient: Educate the patient on how to manage their allergy and what to do in case of an allergic reaction. This may include prescribing medications or providing emergency instructions. **(Sivakumar et al., 2012).**

Monitor the patient: After treatment, monitor the patient for any signs of an allergic reaction. This may include swelling, itching, or difficulty breathing.

By taking these steps, prosthodontists can effectively manage patients with allergies and minimize the risk of adverse reactions. **(Sivakumar et al., 2012)**

Once the allergen has been identified, appropriate materials can be chosen for the prosthesis. For example, if the patient is allergic to nickel, then nickel-free materials can be used. **(Sivakumar et al., 2012).**

1.2.9 patient with Hematologic and Oncologic Disease

1.2.9.1 Disorders of Red Blood Cells

When managing a patient with disorders of red blood cells in prosthodontics, it is important to consider the potential impact of the disorder on the patient's oral health and the prosthesis **(Resnik, 2020)** . Here are some steps that can be taken:

Assess the patient's condition: The first step is to assess the patient's medical history, including the details of the disorder of red blood cells, any medications being taken, and any oral health issues that may impact the prosthesis **(Singh, 2015)** .

Manage anemia: Patients with disorders of red blood cells, such as sickle cell anemia, may experience anemia. The prosthodontist should work with the patient's hematologist to manage the anemia to ensure that the patient is in optimal health for dental treatment.**(Singh, 2015)** .

Take precautions during treatment: During treatment, it is important to take precautions to minimize the risk of bleeding. Patients with disorders of red blood cells may be at higher risk of bleeding, so careful management of the patient's anticoagulation status and use of appropriate hemostatic agents may be necessary.**(Singh, 2015)**.

Provide post-treatment care: After treatment, it is important to provide the patient

with appropriate care instructions and follow-up appointments to ensure that the prosthesis is functioning properly and that there are no complications.**(Singh, 2015).**

1.2.9.2 Disorders of White Blood Cells

When managing a patient with disorders of white blood cells in prosthodontics, it is important to consider the potential impact of the disorder on the patient's oral health and the prosthesis **(Resnik, 2020)**. Here are some steps that can be taken:

Assess the patient's condition: The first step is to assess the patient's medical history, including the details of the disorder of white blood cells, any medications being taken, and any oral health issues that may impact the prosthesis.**(Resnik, 2020)**

Manage immunodeficiency: Patients with disorders of white blood cells, such as leukemia or lymphoma, may experience immunodeficiency. The prosthodontist should work with the patient's hematologist or oncologist to manage the immunodeficiency to ensure that the patient is in optimal health for dental treatment.**(Resnik, 2020).**

Take precautions during treatment: During treatment, it is important to take precautions to minimize the risk of infection. Patients with immunodeficiency may be at higher risk of infection, so careful management of the patient's immunodeficiency status and use of appropriate infection control protocols may be necessary.**(Singh, 2015).**

Provide post-treatment care: After treatment, it is important to provide the patient with appropriate care instructions and follow-up appointments to ensure that the prosthesis is functioning properly and that there are no complications.(**Singh, 2015**).

1.2.9.3 prosthodontics management of patient with Acquired Bleeding and Hypercoagulable Disorders

When managing a patient with acquired bleeding and hypercoagulable disorders in prosthodontics, it is important to consider the potential impact of the disorder on the patient's oral health and the prosthesis (**Moosajee and Rafique, 2020**). Here are some steps that can be taken:

Assess the patient's condition: The first step is to assess the patient's medical history, including the details of the bleeding or hypercoagulable disorder, any medications being taken, and any oral health issues that may impact the prosthesis.(**Moosajee and Rafique, 2020**).

Manage anticoagulation status: Patients with acquired bleeding and hypercoagulable disorders, such as von Willebrand disease or thrombophilia, may require anticoagulation therapy. The prosthodontist should work with the patient's hematologist to manage the anticoagulation therapy to ensure that the patient is in optimal health for dental treatment.(**Moosajee and Rafique, 2020**).

Take precautions during treatment: During treatment, it is important to take precautions to minimize the risk of bleeding. Patients with acquired bleeding and hypercoagulable disorders may be at higher risk of bleeding, so careful management of the patient's anticoagulation status and use of appropriate hemostatic agents may be necessary.**(Moosajee and Rafique, 2020).**

Provide post-treatment care: After treatment, it is important to provide the patient with appropriate care instructions and follow-up appointments to ensure that the prosthesis is functioning properly and that there are no complications **(Moosajee and Rafique, 2020).**

1.2.9.4 prosthodontics management of patient with Congenital Bleeding and Hypercoagulable Disorders

When managing a patient with congenital bleeding and hypercoagulable disorders in prosthodontics, it is important to consider the potential impact of the disorder on the patient's oral health and the prosthesis **(Moosajee and Rafique, 2020)**. Here are some steps that can be taken:

Assess the patient's condition: The first step is to assess the patient's medical history, including the details of the bleeding or hypercoagulable disorder, any medications being taken, and any oral health issues that may impact the prosthesis.**(Moosajee and Rafique, 2020)**

Manage anticoagulation status: Patients with congenital bleeding and

hypercoagulable disorders, such as hemophilia or Factor V Leiden mutation, may require anticoagulation therapy. The prosthodontist should work with the patient's hematologist to manage the anticoagulation therapy to ensure that the patient is in optimal health for dental treatment. **(Moosajee and Rafique, 2020).**

Take precautions during treatment: During treatment, it is important to take precautions to minimize the risk of bleeding. Patients with congenital bleeding and hypercoagulable disorders may be at higher risk of bleeding, so careful management of the patient's anticoagulation status and use of appropriate hemostatic agents may be necessary. **(Moosajee and Rafique, 2020).**

Provide post-treatment care: After treatment, it is important to provide the patient with appropriate care instructions and follow-up appointments to ensure that the prosthesis is functioning properly and that there are no complications.**(Moosajee and Rafique, 2020).**

By taking these steps, prosthodontists can effectively manage patients with congenital bleeding and hypercoagulable disorders and provide them with prosthesis that is functional, comfortable, and safe. It is important to work closely with the patient's hematologist to ensure the best possible outcome for the patient.**(Moosajee and Rafique, 2020).**

The materials used in the prosthesis should be chosen carefully to minimize the risk of adverse reactions or complications. For example, patients with sickle cell

anemia and patients with immunodeficiency may be at higher risk of infection, so materials that are less likely to harbor bacteria should be used. **(Singh, 2015)** .

Patients with congenital bleeding and hypercoagulable disorders may be at higher risk of bleeding, so materials that are less likely to cause bleeding should be used. **(Moosajee and Rafique, 2020)**.

1.2.10 Neurologic, Behavioral, and Psychiatric Disorders

1.2.10.1 prosthodontics management of patient with Neurologic Disorders

Prosthodontic management of patients with neurologic disorders requires a comprehensive understanding of the patient's medical condition, medication regimen, and the impact of the condition on the patient's oral health **(Haralur, 2015)**. The following are some important considerations for prosthodontic treatment planning and management in patients with neurologic disorders:

Collaboration with the patient's healthcare provider: Prosthodontists should collaborate with the patient's healthcare provider to develop an appropriate treatment plan and ensure that the treatment does not interfere with the patient's medical management. **(Haralur, 2015)**.

Assessment of oral function: Patients with neurologic disorders may have impaired oral function, including difficulty with chewing, swallowing, and

speaking. A thorough evaluation of oral function is necessary before prosthodontic treatment planning. **(Haralur, 2015).**

Selection of appropriate prosthodontic materials: Patients with neurologic disorders may have oral sensitivity or allergies to certain prosthodontic materials. The prosthodontist should select appropriate materials that are biocompatible and compatible with the patient's oral condition. **(Haralur, 2015).**

Management of oral hygiene: Patients with neurologic disorders may have difficulty with maintaining good oral hygiene due to physical limitations. The prosthodontist should provide instructions and recommendations for maintaining good oral hygiene, including the use of specialized oral hygiene products and devices. **(Haralur, 2015) .**

Management of bruxism and clenching: Patients with neurologic disorders may exhibit bruxism or clenching behaviors, which can damage prosthodontic restorations. The prosthodontist should consider using materials that are more resistant to wear and tear and may recommend the use of a nightguard to protect the prosthodontic restorations.**(Haralur, 2015) .**

Modification of prosthodontic treatment plan: Patients with neurologic disorders may experience changes in their condition over time, which may require modifications to their prosthodontic treatment plan. The prosthodontist should work with the patient and their healthcare provider to adjust the treatment plan as necessary.**(Haralur, 2015) .**

In summary, prosthodontic management of patients with neurologic disorders requires a collaborative approach that takes into consideration the patient's medical condition, oral function, and prosthodontic needs. By providing individualized treatment plans and modifications, prosthodontists can help these patients maintain good oral health and improve their quality of life. **(Haralur, 2015)** .

1.2.10.2 Prosthodontics management of patients with Psychiatric Disorders

Prosthodontics is a field of dentistry that focuses on the diagnosis, treatment, and management of dental problems related to missing, broken, or damaged teeth. Patients with psychiatric disorders may require special considerations in prosthodontic treatment to ensure their oral health needs are met. **(Kudsi et al., 2020)**.

Here are some key points to keep in mind when managing patients with psychiatric disorders in prosthodontic care:

Understand the patient's condition: Before starting any treatment, it is important to understand the patient's psychiatric condition and any medications they are taking. This will help in planning the treatment and minimizing any potential complications. **(Kudsi et al., 2020)**.

Consider the patient's level of cooperation: Patients with psychiatric disorders may have difficulty following instructions, communicating their needs,

or remaining still during treatment. It is important to be patient and understanding, and to adjust the treatment plan accordingly. **(Kudsi et al., 2020)** .

Coordinate with the patient's healthcare team: Collaboration with the patient's healthcare team, including psychiatrists, psychologists, and social workers, can help in managing the patient's condition and ensuring successful treatment outcomes. **(Kudsi et al., 2020)**.

Consider the use of sedation: Sedation may be necessary to help manage anxiety, fear, or agitation in some patients. However, the use of sedation must be carefully considered, as patients with psychiatric disorders may be more susceptible to adverse effects. **(Kudsi et al., 2020)**.

Plan for follow-up care: Patients with psychiatric disorders may have difficulty with follow-up care, including maintenance and cleaning of prosthetic devices. Providing clear instructions and arranging for regular check-ups can help to ensure long-term success. **(Kudsi et al., 2020)**.

In summary, managing patients with psychiatric disorders in prosthodontic care requires careful consideration of the patient's condition, cooperation, and coordination with the healthcare team, and appropriate use of sedation when necessary. With proper planning and follow-up care, successful outcomes can be achieved. **(Kudsi et al., 2020)**.

1.3 Removable prostheses for medically compromised patients

Removable prostheses can be a viable option for medically compromised patients who need dental prosthetic devices. Studies have shown that removable prostheses can be feasible and effective for patients with various medical conditions, including diabetes, cardiovascular disease, and renal disease (**Felton et al., 2011, Palomares et al., 2018**) .

However, ongoing adjustments may be necessary to ensure the prosthesis fits properly and accommodates changes in the patient's mouth over time (**Omar and Akeel, 2010**).

Different types of dental prosthetic devices are available, including removable prostheses, which can be discussed with a dental professional to determine the best option for each patient's individual needs. 1.5 Fixed prostheses for medically compromised patients (**Omar and Akeel, 2010**) .

1.4 Implant-supported prostheses for medically compromised patients

Implant-supported prostheses can be a viable option for medically

compromised patients who need dental treatment. Studies have shown successful outcomes for patients with conditions such as osteogenesis imperfecta and Sjögren's syndrome (**Tourah et al., 2014, Duttenhoefer et al., 2019**) .

However, careful evaluation and decision-making are necessary to ensure treatment success (**Brånemark et al., 1995, Abduo and Lyons, 2012, Papaspyridakos et al., 2014**). Implant-supported prostheses can provide benefits such as increased chewing ability, bone preservation, and improved psychological outlook for edentulous patients (**Papaspyridakos et al., 2014**).

1.5 Provisional prosthodontic options for medically compromised patients

There are several provisional prosthodontic options for medically compromised patients. Overlay removable partial dentures (ORPDs) can be used as a provisional or interim prosthesis as well as a permanent prosthesis in some cases (**Begonja, 2022**).

The medical evaluation of patients considering prosthodontic treatment is a vital step in the treatment planning process, and the prosthodontist should be able to assess the inherent risks associated with the treatment of patients with systemic conditions (**Zarb et al., 2004**).

Dental implant treatment in medically compromised patients is also possible, and there are resources available to guide clinicians in decision-making and treatment outcomes (**Misch, 2004**).

A recent article in the International Journal of Dentistry provides a treatment protocol for restoring occlusal vertical dimension in medically compromised patients (**Patel and Bencharit, 2009**) .

1.6 Full-mouth rehabilitation for medically compromised patients

Full-mouth rehabilitation is a complex dental procedure that involves restoring the teeth and occlusion of a patient's entire mouth. Medically compromised patients require special considerations during this process.

There are several articles and case reports available that discuss full-mouth rehabilitation in medically compromised patients, including those with bruxism, tooth wear, and dental fluorosis (**Shenoy, 2017, Kumar, 2017, Raghavendra, 2016, Patil, 2013, Jain, 2018**)

These articles highlight the importance of a well-planned and systematic approach to achieve aesthetic, occlusal, and functional parameters. The treatment plan should be tailored to the individual patient's needs and expectations. Full-mouth rehabilitation of medically compromised patients can be challenging due to several factors.

One of the most demanding aspects is the reconstruction of the vertical dimension of occlusion (VDO) at the centric relation and acceptable for the patient. Patients with bruxism and severely worn dentition pose a great challenge to clinicians (**Moslehifard et al., 2016**).

The treatment planning methods and restorative materials used should be selected carefully to fulfill aesthetic, occlusal, and functional. The long treatment time and the need to balance patient expectations and possible treatment results are

other challenges (**Moslehifard et al., 2016**).

Additionally, medically compromised patients may have physical limitations that affect their oral health, making full-mouth rehabilitation more complex (**Moslehifard et al., 2016**).

Best practices for full-mouth rehabilitation in medically compromised patients include a well-planned and systematic approach to simultaneously fulfill aesthetic, occlusal, and functional parameters . (**Magne and Magne, 2006**).

The treatment plan should be tailored to the individual patient's needs and expectations (Siadat et al., 2007). A staged approach to treatment may be necessary, and the patient's medical and dental history should be taken into account (**Rajesh et al., 2014**).

Clinicians should be able to select the most suitable treatment planning methods and restorative materials for each patient (**Alqarni et al., 2020**). The use of a digital smile design (DSD) concept and CAD/CAM restorative materials may be beneficial (**Alqarni et al., 2020**). Additionally, obtaining informed consent from the patient is essential (Alqarni et al., 2020). During the follow-up period, regular maintenance and monitoring of the restorations and supporting tissues are necessary to ensure their longevity and success (**Alqarni et al., 2020**) .

1.7 Multidisciplinary management of medically compromised patients

Managing medically compromised patients requires a multidisciplinary approach that involves medical and dental professionals. Patients with underlying psychiatric problems and diseases need to be recognized by dental professionals for better treatment outcomes **(Kim, 2019)**.

The hospital psychiatrist can play a crucial role in the management of behaviorally compromised medical patients/medically complicated psychiatric patients **(Rangaswamy, 2007)**. It is important for dental professionals to be aware of systemic conditions that can impact dental care and vice versa **(Greenberg BL, 2015.)**

The management of medically compromised patients is classified according to their physical condition. A multidisciplinary approach is necessary to ensure the best possible outcomes for medically compromised patients **(Greenberg BL, 2015.)**.

According to the provided search results, medically compromised patients often have underlying psychiatric problems and diseases that need to be recognized by dental professionals for better treatment outcomes.

The search results mention several medically compromised conditions, including diabetes, cardiovascular disease, renal disease, and connective tissue disease, and reviewed the psychological status of the patients **(Ishikawa Y, 2017)**.

Hospital psychiatrists play a critical role in the management of behaviorally compromised medical patients/medically complicated psychiatric patients

(Chakraborty, 2015)

Dental professionals should be aware of and recognize the different psychological backgrounds of medically compromised dental patients to provide appropriate dental treatment and prevent oral conditions from worsening .

(Chakraborty, 2015)

However, the search results do not provide a comprehensive list of common psychological backgrounds of medically compromised patients.

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1.8 Special needs considerations in prosthodontics for medically compromised patients

Prosthodontic treatment for medically compromised patients requires special considerations. The prosthodontist should assess the inherent risks associated with treating patients with systemic conditions **(Chowdhry R, 2015)**.

Factors such as cardiovascular diseases, endocrine disorders, hematologic and oncologic disease, neurologic disorders, bone disorders, pulmonary diseases, liver diseases, and chronic kidney disease that commonly affect aged individuals should be evaluated **(Chowdhry R, 2015)**. High prevalence of cardiovascular diseases among other medically compromised conditions in dental patients has been reported **(Chowdhry R, 2015)**.

The UCLA School of Dentistry operates a Special Patient Care Clinic that provides quality dental care to individuals with severe developmental disabilities and complex medical histories, including end-stage organ disease, cancers and

associated therapies, complex syndromes, intellectual disabilities, cerebral palsy, Down syndrome, autism, and dementia **(UCLA, 2023)**.

The clinic administers almost 2,000 patient visits per year, providing general dentistry, oral hygiene, urgent and emergency care, and oral disease prevention, as well as more advanced and complex treatments like root canal therapy, periodontal treatment, extractions, and advanced restorative procedures **(UCLA, 2023)**. The clinic also treats nearly 300 patients under anesthesia **(UCLA, 2023)**.

The American Academy of Pediatric Dentistry (AAPD) has published guidelines on the management of dental patients with special health care needs **(American, 2020, American, 2018)**.

The AAPD defines special health care needs as "any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or on expert and/or consensus opinion by experienced researchers and clinicians **.(American, 2018)**.

The guidelines emphasize that postponement or denial of care can result in unnecessary pain, discomfort, increased treatment needs and costs, unfavorable treatment experiences, and diminished oral health outcomes**(Chowdhry R, 2015)**. Dentists have an obligation to act in an ethical manner in the care of patients with special health care needs. **(Chowdhry R, 2015)**.

1.9 Prosthodontic treatment for medically compromised patients with autoimmune diseases

Patients with autoimmune diseases, such as rheumatoid arthritis (RA) and connective tissue diseases (CTD), may require prosthodontic treatment. A study evaluated the implant prosthodontic treatment outcomes for 34 female patients with RA, with or without CTD. The study found that implant survival/success rate, peri-implant conditions, and incidence of prosthodontic maintenance were similar for patients with RA and those with RA+CTD (**Aminzadeh A, 2018**).

However, before surgery, patients with rheumatologic disorders are strongly instructed for thorough oral health care. The treatment of rheumatologic diseases involves a variety of medications that reduce the overall immune response, which may impair wound healing and increase the risk of infection (**Atassi MZ, 2009**). The medical evaluation of patients considering prosthodontic treatment is a vital step in the treatment planning.

The prosthodontist should be able to assess the inherent risks associated with the treatment of patients with systemic conditions. Many factors are associated with evaluating the patient's health status and risk, including the patient's current and past medical and dental history, current and past use of medications, type of treatment, length of treatment, invasiveness of treatment, and degree of urgency of treatment (**Blatz MB, 2013**).

In conclusion, patients with autoimmune diseases may require prosthodontic treatment, and the treatment outcomes for these patients are similar to those without autoimmune diseases.

However, before surgery, patients with rheumatologic disorders are strongly instructed for thorough oral health care. The treatment of rheumatologic diseases involves a variety of medications that reduce the overall immune response, which may impair wound healing and increase the risk of infection.

The medical evaluation of patients considering prosthodontic treatment is a vital step in the treatment planning, and the prosthodontist should be able to assess the inherent risks associated with the treatment of patients with systemic conditions.

1.10 Prosthodontic treatment for medically compromised patients with cancer

Prosthodontics management of patients with cancer may involve rehabilitation of the oral cavity, restoration of oral function, and improving the esthetics of the oral cavity. However, the approach to treatment may vary depending on the type and stage of cancer, the patient's overall health, and the potential impact of cancer (**Siddall et al., 2012**).

Here are some key considerations for prosthodontics management of patients with cancer:

Assess the patient's overall health: Before treatment, the prosthodontist should evaluate the patient's overall health and their ability to tolerate dental treatment. Patients with cancer may be immunocompromised, which can affect their ability to heal from dental procedures. (**Siddall et al., 2012**).

Coordinate with the patient's oncologist: The prosthodontist should work closely with the patient's oncologist to determine the best course of treatment and ensure that any dental treatment is safe and appropriate.**(Siddall et al., 2012).**

Choose appropriate materials: The materials used in the prosthesis should be chosen carefully to minimize the risk of adverse reactions or complications. Patients with cancer may be more sensitive to certain materials, so materials that are less likely to cause irritation or inflammation should be used.**(Siddall et al., 2012).**

Take precautions during treatment: During treatment, it is important to take precautions to minimize the risk of infection. Patients with cancer may be more susceptible to infections, so strict infection control measures should be taken.**(Siddall et al., 2012).**

Provide post-treatment care: After treatment, it is important to provide the patient with appropriate care instructions and follow-up appointments to ensure that the prosthesis is functioning properly and that there are no complications.**(Siddall et al., 2012).**

In addition to prosthodontic management, oral care for patients with cancer is also crucial. Patients with cancer are at higher risk of developing oral complications, such as oral mucositis, infection, and dental caries, due to cancer treatment **(Siddall, 2012)** .Here are some key considerations for oral care of patients with cancer:

Educate the patient on oral care: Patients with cancer should be educated on

proper oral care practices, including regular brushing and flossing, and the use of alcohol-free mouthwashes.(Siddall et al., 2012).

Monitor for oral complications: Patients with cancer should be monitored for oral complications, such as oral mucositis, infection, and dental caries, and treated promptly to prevent further complications.(Siddall et al., 2012).

Adjust oral care based on cancer treatment: Oral care practices may need to be adjusted based on the type and stage of cancer, as well as the type of cancer treatment being received.(Siddall et al., 2012).

Manage dry mouth: Patients with cancer may experience dry mouth due to cancer treatment, which can increase the risk of dental caries. The use of saliva substitutes and other oral moisturizers may be helpful in managing dry mouth.(Siddall et al., 2012).

By providing appropriate prosthodontic management and oral care, prosthodontists can help improve the quality of life for patients with cancer and minimize the impact of cancer treatment on oral health.(Siddall et al., 2012).

1.11 Prosthodontic treatment for medically compromised patients with HIV/AIDS

Prosthodontics management of patients with AIDS, HIV infection, and related conditions requires a comprehensive approach that takes into account the patient's

overall health, medications, and potential complications associated with HIV **(Singla et al., 2018)**. Here are some key considerations:

Medical history: Patients with HIV may have a history of related complications, such as oral candidiasis, oral hairy leukoplakia, or periodontal disease. It is important to obtain a detailed medical history and review any existing medical treatment plans. **(Singla et al., 2018)**.

Evaluate oral health: Patients with HIV may have a higher risk of oral health problems, such as oral candidiasis or periodontal disease. Prosthodontists should evaluate the patient's oral health and develop a treatment plan that takes into account any existing oral health problems. **(Singla et al., 2018)**.

Plan treatment carefully: Patients with HIV may have a compromised immune system and may be more susceptible to infections associated with oral surgery or implant placement. Prosthodontists should plan treatment carefully and take steps to mitigate these risks, such as using appropriate antibiotic prophylaxis. **(Singla et al., 2018)**.

Monitor antiretroviral therapy: Patients with HIV may be taking antiretroviral therapy that can affect their oral health or interact with prosthodontic treatment. Prosthodontists should consult with the patient's infectious disease specialist or primary care physician to ensure that any necessary medication adjustments are made to minimize potential oral health complications. **(Singla et al., 2018)**.

Encourage regular dental check-ups and cleanings: Patients with HIV should be encouraged to have regular dental check-ups and cleanings to detect any potential oral health problems early on. **(Singla et al., 2018).**

Consider social and psychological factors: Patients with HIV may experience social and psychological challenges related to their diagnosis. Prosthodontists should be aware of these factors and provide a supportive and non-judgmental environment for their patients. **(Singla et al., 2018).**

In summary, prosthodontics management of patients with AIDS, HIV infection, and related conditions requires a comprehensive approach that takes into account the patient's overall health, medications, and potential complications associated with HIV. By working collaboratively with the patient's healthcare team, prosthodontists can develop a treatment plan that promotes good oral health and minimizes potential complications. **(Singla et al., 2018).**

1.12 Prosthodontic treatment for medically compromised geriatric patients

Prosthodontic treatment for medically compromised geriatric patients requires careful evaluation and management of systemic conditions **(McGarry TJ, 2009, Yoda N, 2014)**. The prosthodontist should assess the inherent risks associated with the treatment of patients with systemic conditions **(McGarry TJ, 2009, Yoda N, 2014)** .

The medical evaluation of patients considering prosthodontic treatment is a vital step in the treatment planning (Raja J, 2010, McGarry TJ, 2009). The patient's current and past medical and dental history, current and past use of medications, type of treatment, length of treatment, invasiveness of treatment, and degree of urgency of treatment should be evaluated (**McGarry TJ, 2009**).

Systemic diseases such as cardiovascular diseases, endocrine disorders, hematologic and oncologic disease, neurologic disorders, bone disorders, pulmonary diseases, liver diseases, and chronic kidney disease that commonly affect aged individuals should be reviewed (**McGarry TJ, 2009, Yoda N, 2014**).

The prosthodontic considerations that should be taken care of while providing adequate oral health care will also be discussed (**McGarry TJ, 2009, Yoda N, 2014**). For older patients, clinicians should consider maintaining teeth and using functionally-orientated treatment strategies as an alternative to removable prostheses (**Zhan L, 2015**).

When the remaining dentition has a poor prognosis, key teeth should be preserved as overdenture abutments and a gradual transition to edentulousness planned. Where complete dentures are provided, these can be retained using dental implants to overcome many of the problems associated with conventional replacement dentures (**Jivraj S, 2006**).

1.13 Prosthodontic treatment for medically compromised pediatric patients

Prosthodontic treatment for medically compromised pediatric patients requires a thorough medical evaluation to assess the inherent risks associated with the treatment of patients with systemic conditions (**Chandwani B, 2017, Sari E, 2018**)

The prosthodontist should be able to evaluate the patient's cardiovascular diseases, endocrine disorders, hematologic and oncologic disease, neurologic disorders, bone disorders, pulmonary diseases, liver diseases, and chronic kidney disease that commonly affect aged individuals (Sari E, 2018). The prosthodontist should also (Shigli K, 2011) be able to assess the patient's inherent risks associated with the treatment of patients with systemic conditions (**Chandwani B, 2017, Sari E, 2018**)

The prosthodontic considerations that should be taken care of while treating medically compromised pediatric patients include endocarditis prophylaxis, limiting the amount of epinephrine administered, and avoiding drugs that are eliminated and metabolized by the kidneys (**Shigli K, 2011, Chandwani B, 2017**)

The prosthodontist should also be aware of the patient's medications and

their side effects (**Zarb GA, 2017**). For example, epinephrine may cause a hypertensive event in patients taking non-selective B blockers including carvedilol, propranolol, nadolol, and sotalol (**Zarb GA, 2017**)

In addition, the prosthodontist should be aware of the patient's oral health care needs and provide individualized preventive oral health practices to reduce the child's risk of preventable dental/oral disease (**Zarb GA, 2017**)

The prosthodontist should also be aware of the patient's unmet dental needs and barriers to care for children with significant special health care needs (**Zarb GA, 2017**)

The American Academy of Pediatric Dentistry provides guidelines on the management of dental patients with special medical conditions, including the policy on interim therapeutic restorations. (**Zarb GA, 2017**)

1.14 Future directions in prosthodontics applications for medically compromised patients.

Prosthodontic treatment planning for medically compromised patients requires a thorough medical evaluation to assess the inherent risks associated with the treatment of patients with systemic conditions. (**Felton, 2002, Owall, 2004**)

The prosthodontist should be able to evaluate the patient's cardiovascular diseases, endocrine disorders, hematologic and oncologic disease, neurologic

disorders, bone disorders, pulmonary diseases, liver diseases, and chronic kidney disease that commonly affect aged individuals **(Owall, 2004)**.

General considerations of these systemic disorders along with the prosthodontic management modifications needed for providing adequate oral health care should also be taken into account **(Singh A, 2011)** .

The future of prosthodontics for medically compromised patients is focused on improving patient-centered outcomes. The outcomes of prosthodontic procedures are variable and cannot be assessed reliably without measuring patient-centered outcomes **.(Wolfart S, 2020)**

The integration of digital intraoral and extraoral surface images as well as three-dimensional imaging already allows treatment options and their impact on facial esthetics to be more visualizable and precise **(Joda T, 2017)**. The driving force in the future will be the desire for improved facial esthetics, which is significantly influenced by the teeth **(Joda T, 2017)**.

The general trend towards personalized medicine will further increase the diversity of materials and treatments in dental prosthetics **(Joda T, 2017)**.

In conclusion, the management of medically compromised prosthodontic patients requires a thorough medical evaluation to assess the inherent risks associated with the treatment of patients with systemic conditions.

The future of prosthodontics for medically compromised patients is focused on improving patient-centered outcomes, with the integration of digital imaging and personalized medicine playing a significant role in achieving this goal.

CONCLUSION

From this study, the following conclusion were made :

The successful management of patient begins from taking the adequate medical history to making the proper treatment plan. Many of the aged patients are already diagnosed with some medical condition before they present for prosthodontic treatment. The prosthodontic procedures are delayed until the medical conditions are evaluated. The drugs taken by the patient for their systemic condition should be known since they have an impact on treatment outcome along with the drug interactions. Medical consultation should always be considered for appropriate treatment modifications, wherever required. Systemic evaluation, as well as the physician, consultation should be an integral part of prosthodontic treatment plan.

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