

## Review Article

# Oral care and protocols in cancer patients

Waleed Mohammed Bugshan<sup>1\*</sup>, Abdulrahman Saleh Alissa<sup>2</sup>, Raghad Ammar Baidas<sup>3</sup>,  
Rawan Rashood Al Qwizany<sup>3</sup>, Asail Jazi Alharbi<sup>4</sup>, Abdulrhman Mustafa Alsharif<sup>5</sup>,  
Alhassen Abdurabuh Jafer<sup>6</sup>, Abdullah Khalid Albaz<sup>7</sup>, Saud Khalid Alkhalid<sup>7</sup>,  
Firas Mohammed Alsultan<sup>8</sup>, Rawan Mohammed Alamoudi<sup>9</sup>

<sup>1</sup>Department of Family Dentistry, King Abdulaziz Hospital, Jeddah, Saudi Arabia

<sup>2</sup>North Riyadh Dental Center, Ministry of Health, Riyadh, Saudi Arabia

<sup>3</sup>Dental Department, Specialized Medical Center Hospital, Riyadh, Saudi Arabia

<sup>4</sup>College of Dentistry, Batterjee Medical College, Jeddah, Saudi Arabia

<sup>5</sup>Dental Department, Dental Specialist Center in Tabuk, Tabuk, Saudi Arabia

<sup>6</sup>College of Dentistry, Jazan University, Jazan, Saudi Arabia

<sup>7</sup>Dental Department, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

<sup>8</sup>Department of Restorative Dentistry, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

<sup>9</sup>College of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabi

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### \*Correspondence:

Dr. Waleed Mohammed Bugshan,

E-mail: w.b18.wb@gmail.com

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## ABSTRACT

With the passage of time and new emerging techniques significant progression is seen in cancer treatment modalities. However, oral care of the cancer patients is of utmost importance since chemotherapy notably impacts the oral health of cancer patient's majorly causing mucositis and various other infections. Oral problems are more common in cancer patients, and 80% of patients suffer from them. These oral problems have a profound effect on a patient's ability to eat, drink, and speak and are often accompanied by pain, which can lead to increased demand for systemic drugs, longer hospital stays, and an increased risk of life-threatening system infections. The aim of this research is to review the available information about the oral care and protocols in cancer patients. The dentist's role in the integrated care of oncology patient includes ongoing involvement from diagnosis to end. Various protocols are advised in literature which include the use of dental floss and mouthwash, prior to chemotherapy in oral hygiene procedures, requirement of comprehensive clinical and radiographic examinations when assessing oral health, antibiotic prophylaxis, extractions and certain other protocols. Basic oral care which refers to actions that should be included in a general patient care throughout cancer treatment to maintain good oral health and reduce the risk of local inflammation and infection, is essential for cancer patients. However, future clinical and comprehensive research into oral care protocols among cancer patients could further strengthen the literature and highlight the role of the dentist in this regard.

**Keywords:** Oral, Care, Cancer, Patient, Protocol

## INTRODUCTION

In the field of cancer treatment, significant progress has been made, and the increasingly accessible science of genetic deep sequencing has provided new insight into

cancer biology. Targeted therapy using novel chemotherapeutic drugs targeting specific biology of tumours is becoming more commonly available with the emergence of precision medicine.<sup>1</sup> Oral bacteria have been linked to major systemic disorders as well as dental and

periodontal diseases. Oral hygiene is critical, especially for malnourished hospitalized patients. This is because poor oral hygiene is more likely to cause aspiration pneumonia in immune-compromised patients, which is induced by the aspiration of foreign objects into the bronchial airway. Oral hygiene, which includes professional oral care, helps to reduce bacterial levels in the mouth. Daily oral care has been demonstrated to decrease the incidence of fever and pneumonia-related mortality in the elderly. For the patient population requiring nutritional support team intervention, such as those with head and neck cancer and those who are malnourished, elderly, and fragile, oral health screening, management, and care are especially important.<sup>2</sup>

The three most frequent cancer treatment options are surgical resection, radiation, and chemotherapy, which can be used alone or in combination. Although these treatments are efficient in removing the tumour, they may cause inevitable harm to oral tissues and dental equipment, particularly in cases of head and neck cancer. Oral problems can happen during and after cancer treatment. Because of its rapid cell turnover rate, the mucosal lining of the gastrointestinal tract, particularly the oral mucosa, is a major target for treatment-related toxicity. Chemotherapy and radiation to the head and neck region can affect cell division and disrupt normal oral mucosa regeneration. Furthermore, it might change the structure and function of underlying supporting tissues, such as salivary glands and bone also surgical procedures can be disfiguring, and reconstruction efforts can be fruitless.<sup>3</sup>

Symptoms related to disease progression or toxicities including side effects of oncologic treatment are the leading causes of hospitalization in cancer patients. In this context, poor dental hygiene and oral lesions can lead to a high rate of local or odontogenic infections and systemic infections, such as respiratory diseases like ventilator-associated pneumonia, which can cause cancer treatment delays or interruptions, as well as a reduction in patient quality of life. Due to the requirement for a specific diet like feeding tubes, narcotic analgesia, and prolonged hospitalization, oral problems linked to cancer progression or connected to oncologic treatment may also raise the overall treatment cost.<sup>4</sup>

Oral mucositis is a painful, inflammatory, and typically ulcerative illness that can occur as a result of cancer treatment. Almost all patients having head and neck radiation therapy, as well as 75-100% of hematopoietic stem cell transplant patients, develop this disease, with higher rates linked with particular conditioning regimens. Severe oral mucositis may necessitate enteral or parenteral nourishment as well as systemic analgesics, as well as an increased risk of systemic infections due to the disturbed oral mucosal barrier, unplanned and lengthy hospitalizations, and cancer therapy disruptions.<sup>5</sup>

Oral problems are widespread in cancer patient populations, with 80% of patients suffering from them.

These oral issues have a substantial impact on the patient's ability to eat, drink, and speak. These oral problems are frequently coupled with pain, which can lead to a greater demand for systemic narcotics, a longer hospital stay, and an increased risk of life-threatening systemic infections. All of these consequences could lead to a reduction in health-related quality of life, which would be detrimental to the patient and his or her family. Oral mucositis has been considered the most distressing element of cancer treatment by some individuals.<sup>6</sup> The purpose of this research is to review the available information about the oral care and protocols in cancer patients.

## METHODS

This study is based on a comprehensive literature search conducted on 13 May 2022, in the Medline and Cochrane databases, utilizing the medical topic headings (MeSH) and a combination of all available related terms, according to the database. To prevent missing any possible research, a manual search for publications was conducted through Google Scholar, using the reference lists of the previously listed papers as a starting point. We looked for valuable information in papers that discussed the information about the oral care and protocols in cancer patients. There were no restrictions on date, language, participant age, or type of publication.

## DISCUSSION

The role of the dentist in the oncology patient's integrated care includes continual engagement from diagnosis of diseases through survivorship. Oncology patients' oral treatment should begin as soon as possible following their diagnosis, with the detection of local-regional disorders such as potentially malignant oral illness and oral findings of systemic tumours which may manifest with local signs and symptoms.

It continues with a dental exam and diagnosis and management of frequently encountered disorders in preparation for cancer therapy, as well as prevention and management of oral problems during treatment and afterward. The type of cancer treatment and any probable oral side effects determine the patient's follow-up. Patients with head and neck cancer and haematological malignancies should be seen at least once a week, while patients with other solid tumours should be seen as needed. Oral treatment in survival is also dependent on the patient's oral condition and the individual disease.<sup>7</sup>

In case of paediatric patients all children, but particularly children with cancer, should have their oral cavity assessed and dental issues managed. These children experience dental and oral care issues during various stages of cancer therapy and after it is completed. From a dental standpoint, a paediatric patient undergoing oncology treatment may have: firstly untreated dental caries, periodontal disease, and pathologic lesions of the oral hard and soft tissues; secondly oral manifestations of cancer; thirdly oral

complications as a result of cancer therapies; and lastly may suffer long-term dental and orofacial complications after cancer therapies are completed.<sup>8</sup>

### **Dental care protocols in cancer patients**

Basic oral care refers to the actions that should be included in a patient's routine care throughout cancer treatment to preserve good oral health and limit the risk of local inflammation and infection, as well as systemic infection originating in the mouth. Basic oral care has the following objectives: infection prevention: to avoid infection of the oral mucosa and periodontium, as well as local spread and systemic infection; pain control: to reduce discomfort and pain in the mouth; oral functions: to promote oral nutritional intake, oral intake of fluids, and the ability to speak; cancer treatment complications: to reduce the adverse effects of radiation therapy, chemotherapy, and newer targeted therapies; and finally, to improve oral health.<sup>6</sup>

Dental intervention, including the use of dental floss and mouthwash, is recommended before chemotherapy in oral hygiene protocols. Chlorhexidine appears to be less effective than distilled water or normal saline solution. Rinses with povidone-iodine also help to lessen the intensity of oral mucositis. Anti-inflammatory medications, such as benzydamine, can be used to prevent and treat oral mucositis. Oral mucositis can be prevented using immunoglobulins and histamine gels through intravenous administration. Reactive oxygen species are hypothesized to be suppressed by cytoprotective medicines like amifostine. Sucralfate is ineffective against oral mucositis and is frequently accompanied by nausea, rectal bleeding, and numerous rectal diseases. Glutamine, on the contrary, is utilized to cure as well as prevent oral mucositis. Allopurinol's role in prevention of mucositis is debatable. Propantheline reduces mucosal exposure to salivary agents by causing hyposalivation. Anaesthetics like xylocaine and lidocaine solutions, also analgesics like morphine, are used to relieve pain.<sup>9</sup>

A dental examination should be performed several weeks before the initiation of radiation therapy for head and neck cancer. A comprehensive clinical and radiographic evaluation is required when assessing oral health, including proper evaluation of dental caries, pulpal and periapical disease, root resorption, periodontal disease with associated probing depths, furcation involvement, tooth mobility, tooth impactions, and oral pathology. Based on current oral health condition, the evaluation should focus on evaluating any potential concerns that could occur either during or soon after radiation. This should involve a look at the alveolus for any anomalies that need to be addressed before future denture manufacturing, such as tori reduction or removal. Elective treatments should be postponed until after cancer treatment is completed. Prior to radiation treatment, any potential oral problems inside the anticipated radiation field should be

addressed. Any discomfort or trauma to the mouth should be addressed and avoided.<sup>10</sup>

When there are time constraints for a complete dental evaluation and treatment protocol in case of intensive chemotherapy, partial dental evaluation and treatment protocols with minor caries, asymptomatic third molars or asymptomatic teeth without excessive probing with depth >8 mm, mobility I or II, or periapical lesions of 5 mm are a viable option. In post-head and neck radiation patients who are compliant fluoride users, the use of chlorhexidine, fluoride mouth rinses, composite resin, resin-modified glass ionomer cement, and amalgam restorations over traditional glass ionomer cement is suggested.<sup>5</sup> Alvarez recommends in his study that all teeth with questionable conditions shall be extracted before radiotherapy sessions. If extractions are necessary, the condition of the tooth, the motivation of the patient, and the capability to follow dental hygiene guidelines should all be considered. In case of or when developing extractions, patients should be treated as, treatment with antibiotic prophylaxis as needed and recommended, rinsing with an antiseptic mouthwash such as 0.12% chlorhexidine digluconate for 1 min and using an anaesthetic method. Anaesthesia with a vasoconstrictor and truncal block, infiltrative anaesthesia, with or without intraligamentary anaesthesia should be performed with as little trauma as possible, as well as regularization of the alveolar process by margin approximation. Analgesic and anti-inflammatory medication along with antiseptic mouthwash with 0.12% chlorhexidine digluconate are given as needed after surgery with antibiotic coverage. Finally, the minimum number of appointments shall be scheduled, beginning with mandibular exodontias.<sup>11</sup>

Lopez recommends that in order to ensure appropriate recovery, dental extractions and periodontal care should be performed at least 14 days prior to cancer treatment. Delays may be necessary in some situations like where tooth extractions are required before head and neck radiotherapy. Similarly, patients with haematological malignancies must eliminate infection sources as soon as possible to avoid the possibility of febrile neutropenia. Dentists should evaluate the oral cavity frequently throughout the cancer treatment duration to ensure adequate oral health and handle any antineoplastic medication adverse effects. However, it might be feasible to complete dental treatment in between chemotherapy cycles, depending on the cancer treatment strategy. If invasive dental treatment is required, consult with the patient's medical team to assess haematological indices and the necessity for antibiotic prophylaxis, 7 to 14 days after starting chemotherapy, a patient's blood cells will attain their lowest number. After the neutrophil count has begun to improve from the minimum, surgical dental operations can be undertaken.<sup>12</sup>

Depending on the patient's health and treatment phase, performing dental operations can pose a risk to him.

Additionally, certain procedures are riskier than others. Non-invasive techniques including types I and II can thus be performed during any phase of the disease or treatment. Procedures of type III may necessitate further attention. Finally, intrusive operations with categories IV, V, and VI carry a higher risk of complications. In high-risk scenarios, such as those involving pain in acute cases, the patient should be helped in a hospital setting, if necessary, with haematological indices like transfusions and, if needed, antibiotic coverage. Two haematological indicators, neutrophil and platelet counts, are very significant when screening patients for dental operations. Prophylactic antibiotic therapy approaches should be explored in the case of low neutrophil counts and when the procedure cannot be postponed.<sup>13</sup>

Cryotherapy, the use of a helium-neon laser, and the development of radiation fields to safeguard the oral tissues during radiation therapy are all alternatives for treating oral mucositis. A variety of mouthwashes with anti-inflammatory, anaesthetic, analgesic, antipyretic, and antibacterial effects are also employed. Systemically administered pharmacological drugs such as pentoxifylline, thalidomide, and simvastatin have been linked to the onset and severity of all transplant-related problems. Clinical investigations have demonstrated that these medications minimize the occurrence and intensity of significant problems, such as oral mucositis. Helium-neon laser therapy, which uses a low-intensity laser, is used as a pre-treatment to help patients with mucositis who are receiving chemotherapy. However, because this sort of treatment necessitates expensive equipment and trained operators, it is typically limited to a small number of patients.<sup>14</sup>

Ruiz-Esquivel G suggests that antineoplastic drugs cause harm to the oral mucosa, which stimulates the local production of numerous pro-inflammatory and pro-apoptotic molecules and ultimately leads to ulcer formation. Patients with such lesions are at risk for a variety of infections and nutritional problems. This also leads to changes in treatment plans, potentially influencing the overall prognosis. Preventive interventions such as local cryotherapy with ice chips and phototherapy with a low-energy laser may be beneficial. Treatment options include allopurinol mouthwashes and low-energy laser phototherapy. To reduce mucosal harm during radiotherapy, special radiation administration procedures should be adopted. With the use of patient-controlled analgesia and topical morphine, pain treatment should always be optimized. Outside of research protocols, supplemented glutamine should not be used. Finally, overall hygiene and care should be given careful consideration.<sup>15</sup> The guidelines and related recommendations should be implemented in clinical settings through an interdisciplinary process comprising the most relevant health care specialists, such as nursing, dental medicine, medicine, and pharmacy. It is critical to combine best practices with an institutional quality improvement process, starting with a status assessment prior to the implementation of codified basic oral care

practices and continuing to monitor both positive and negative outcomes. Also, education of health and dental care professionals, patients and their families regarding oral care during cancer treatment is essential.<sup>16</sup> There is still need for more concise and evidence-based guidelines and protocols for oral care of cancer patients as literature is quite dispersed, further clinical and comprehensive research will not only contribute to literature but will also signify the role of dentistry and will also aid in designing better strategies of treatment leading to provision of quality services for cancer patients and survivors.

## CONCLUSION

Dentists are uniquely qualified to manage patients suffering from cancer before, during, and after treatment. Patients undergoing cancer therapy are at an increased risk of having oral problems such as oral mucositis, infections, hyposalivation, dental caries, and several other complications. Also, cancer survivors may be at risk for oral issues for the rest of their lives, necessitating long-term dental care even after their treatment has ended. Patients should have a complete oral examination prior to starting treatment, as well as during and after treatment, to detect any ongoing infections. More research in future on oral care protocols among cancer patients can further strengthen the literature and highlight the role of dentist in this regard.

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