

Quality Resource Guide

Fifth Edition

Management of Oral Complications Associated with Cancer Therapy

Author Acknowledgements

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Educational Objectives

Following this unit of instruction, the learner should be able to:

1. Understand basic therapies utilized to manage oral cavity and oropharyngeal carcinoma.
2. Recognize the potential major acute and chronic oral complications of cancer therapy.
3. Understand the importance of providing appropriate dental therapy prior to initiation of cancer therapy.
4. Understand oral supportive care interventions provided during cancer therapy.
5. Understand the need to implement appropriate post-cancer therapy strategies to maintain oral health.

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The following commentary highlights fundamental and commonly accepted practices on the subject matter. The information is intended as a general overview and is for educational purposes only. This information does not constitute legal advice, which can only be provided by an attorney.

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Introduction

Oral cavity cancer (OCC) and cancer of the oropharynx (OPC) are estimated to affect 59,640 patients (42,500 men and 17,140 women) in the United States during 2025.¹ Medical therapies to address these cancers often lead to debilitating changes affecting the oral cavity and oropharynx. In addition, the use of chemotherapy (CT) for a host of other malignancies may adversely affect the oral health of the patient. All cancer patients entering the healthcare system undergo a comprehensive medical assessment to determine the stage of their disease. For OCC and OPC, the **T** (tumor size), **N** (regional lymph node involvement), **M** (distant metastasis) staging system is used, with lower stages of disease having a better prognosis.^{2,3} To maintain prognostic fidelity, the TNM staging algorithm for OPC was recently revised to reflect the increasing occurrence of HPV-associated OPCs.⁴ HPV-associated OPCs are more responsive to treatment and carry a better prognosis than OPCs attributable to tobacco and alcohol exposure.

Therapy to manage a patient with cancer is multidisciplinary. Factors to consider include the location and stage of the tumor, the patient's comorbidities, the patient's emotional status, the experience of the oncology team, the resources of the treatment facility, and the patient's desires. Where feasible, surgery remains an essential therapeutic intervention for most cancers. Radiation therapy (RT) and/or CT may be prescribed as primary interventions for non-resectable disease or used in combination with surgery to improve cancer control.^{2,3}

From a dental perspective, the oral management of the patient with cancer can be divided into three stages: 1) oral assessment and therapy before initiation of cancer therapy, 2) oral supportive care during cancer therapy, and 3) oral care following completion of cancer therapy. This guide reviews the commonly encountered adverse effects associated with cancer therapy that impact the oral cavity and the three stages of oral care and support for patients with cancer.

Overview of Common Oral Complications with Cancer Therapies

Surgery continues to be a front-line therapy to treat OCC and OPC. It may be the only therapy necessary to cure small, easily accessible lesions such as lower lip cancer.² Surgical intervention to manage more advanced disease often results in extensive functional impairment (e.g., trismus, dysphagia, speech impairment) and disfigurement, necessitating extensive reconstruction and/or rehabilitation.⁵

RT and/or CT may be used as either primary or adjunctive therapy to treat OCC and OPC and often causes predictable oral complications (see **Table 1**).⁶⁻⁸ In addition, CT protocols capable of inducing myelosuppression (e.g., leukemia therapy, bone marrow stem cell transplantation) also result in predictable oral complications. The occurrence of these complications is attributed in large part to the rich and diverse oral microflora, the high cellular turnover rate of the oral mucosa, and the relatively common occurrence of oral trauma during normal function.⁸ Although both CT and RT regimens are associated with oral complications, there are important differences between the two. Oral complications associated

with CT regimens tend to be acute and resolve following discontinuation of therapy. In contrast, RT often incurs site-specific irreversible damage to structures "within the beam", leading to several persistent complications.

Mucositis

Mucositis remains the most problematic acute oral complication of RT and/or CT. Its etiopathogenesis involves a complex interplay of therapy-induced tissue insults and subsequent inflammatory responses by the patient.⁶⁻⁹ The risk of developing mucositis depends on patient and treatment variables. The most commonly affected sites are those with high epithelial turnover, such as the labial mucosa, buccal mucosa, floor of mouth, tongue, and soft palate. Approximately 70% - 80% of patients subjected to myelosuppressive CT experience mucositis, and almost all RT patients experience some degree of mucositis. For patients undergoing a combined CT-RT protocol to treat OCC or OPC, the occurrence of mucositis is virtually assured.⁶

The two most common types of CT agents implicated in mucositis are listed in **Table 2**.¹⁰ Concurrent immunosuppression likely contributes to the exacerbation of mucositis through oral microflora colonization and secondary infection.

Table 1 - Oral Complications of Cancer Therapy⁶⁻⁸

Acute	Chronic
- mucositis - salivary dysfunction - pain - infection - altered taste	- compromised mucosa - salivary dysfunction - infection - altered taste - pain - osteonecrosis/MRONJ

Table 2 - Common Chemotherapy Agents Associated with Mucositis¹⁰

Cytotoxic agents	Cytarabine Melphalan	Doxorubicin Fluorouracil	Etoposide Methotrexate	
Molecular target agents	Afatinib Everolimus Sorafenib	Cetuximab Lenvatinib Sunitinib	Dacomitinib Niraparib Temozolomide	Erlotinib Palbociclib Regorafenib

Onset typically occurs within the first two weeks of CT and full resolution usually occurs within 10-14 days of CT cessation. The immune checkpoint inhibitors (**Table 3**) are increasingly prescribed to treat various malignancies. They have been associated with oral lichenoid reactions, Sjögren's disease, and mucous membrane pemphigoid-like lesions.¹¹

RT induced mucositis appears to result from direct tissue ionization and is dependent on the type of radiation utilized, the total dose administered, the field size and fractionation. While RT-induced mucositis may heal within a few weeks after the cessation of therapy, there is invariably some degree of permanent damage resulting in mucosa that is atrophic, less pliable and more prone to future irritation and ulceration.⁶⁻⁹

Salivary Dysfunction

Impaired salivary function due to CT toxicity is usually short-lived and of little long-term consequence. However, salivary hypofunction associated with RT is often permanent and remains one of the most problematic long-term complications.^{6,8,12} The extent of impairment depends on the radiation dose and the volume of the gland irradiated. Cumulative radiation doses greater than 30Gy may incur permanent damage.⁶ While all salivary gland tissues are at risk, the parotid gland appears to be the most susceptible. It should be noted that I¹³¹ radioablative therapy to treat thyroid disease (carcinoma, Grave's disease) may also lead to salivary dysfunction.¹³

Salivary hypofunction not only results in oral dryness (xerostomia) but also decreased oral clearance, remineralization activity, antibacterial activity, and buffering capacity.^{12,14} A drop in the salivary pH creates an acidic environment that promotes the rapid growth of acidophilic organisms such as mutans streptococci, lactobacillus and candida. The result is a dramatically increased risk of developing dental carious lesions (radiation caries).

Infection

In scenarios of CT-induced myelosuppression, the risk of developing an oral-sourced systemic infection (bacterial, viral, fungal) remains a serious

Table 3 - Immune Checkpoint Inhibitors¹¹

Type	Drugs		
Anti-PD-1 (programmed cell death protein 1)	Cemiplimab Pembrolizumab Tislelizumab	Dostarlimab Penpulimab Toripalimab	Nivolumab Retifanlimab
Anti-PD-L1 (programmed cell death ligand 1)	Atezolizumab Durvalumab	Avelumab	Cosibelimab
Anti-CTLA-4 (cytotoxic T lymphocyte-associated protein 4)	Ipilimumab	Tremelimumab	
Anti-LAG3/anti-PD-1 (lymphocyte-activation gene 3)	Relatlimab	Nivolumab	

concern.⁶⁻⁸ Patients undergoing RT to the head and neck frequently develop oral candidiasis, especially when hyposalivation is present.

Altered Taste

CT and RT may result in alterations in taste (dysgeusia) or loss of taste (ageusia), which may persist following radiation therapy.⁶⁻⁸ Cancer therapy may directly damage the taste buds, and salivary hypofunction results in reduced solubilization of food for presentation to the taste buds.

Pain

Pain is a frequently observed complication of cancer therapy. It may be caused by the malignancy, as an adverse effect of therapy (mucositis), or dental disease.^{7,8} Pain during therapy may hinder the patient's ability to comfortably eat, speak, and swallow, which may ultimately require an interruption of the scheduled cancer therapy. Even after cessation of cancer therapy, some degree of pain or discomfort may persist to negatively impact the patient's quality of life.⁶

Osteoradionecrosis (ORN) and Medication-related Osteonecrosis of the Jaw (MRONJ)

ORN is considered the most serious oral complication of RT for OCC and OPC. RT doses to the mandible above 50Gy result in fibro-atrophic bone changes and microvascular dysfunction.^{15,16} These changes result in permanent impairment of normal bone homeostasis and the ability for wound healing to progress, increasing the risk for ORN. ORN presents as exposed necrotic bone.

Other potential signs and symptoms of ORN include diminished or lost sensation, fistula development, and infection. The pain and inflammation vary from mild to severe. The most commonly affected site is the posterior region of the mandible. The risk of ORN due to RT is considered lifelong and estimated to be 5%.¹⁵ ORN may develop spontaneously, with known contributing factors including oral infection, trauma, diabetes, collagen vascular disease, tobacco/alcohol abuse, and poor nutrition.⁶

MRONJ is associated with the antiresorptive drugs (e.g., zoledronic acid, pamidronate, alendronate, denosumab) and the antiangiogenic drugs (e.g., bevacizumab, sunitinib, sorafenib) often prescribed to prevent the skeletal-related events (SRE) observed in certain cancers (e.g., metastatic breast, lung, and prostate cancer, and multiple myeloma).⁸ Antiresorptive drugs are also commonly prescribed to prevent osteoporosis, but at generally lower doses. The risk of MRONJ associated with SRE prevention is estimated at <5%, while the risk associated with osteoporosis prevention is estimated at ≤0.05%.¹⁷ MRONJ and ORN are clinically similar but easily differentiated based on patient history.

Oral Assessment and Care Before Initiation of Cancer Therapy

The presence of poor oral health going into cancer therapy increases the patient's likelihood of developing oral complications associated with

RT and/or CT, both in terms of incidence and severity. Whenever possible, efforts to stabilize the oral status of the patient (aka clearance) should be undertaken before initiating the necessary cancer therapy, ideally one month before the initiation of therapy.^{8,18,19} The dental treatment plan is predicated on correlating the results of a thorough dental examination with the planned cancer therapy.

Radiation Therapy to Treat Cancer of the Oral Cavity and Oropharynx

Due to the potential life-long oral complications associated with head and neck RT, the goal of the dental clearance is to eliminate existing oral disease and reduce the likelihood of future complications. In addition to eliminating active oral disease, the clinician must realistically assess the patient's ability and commitment to perform necessary preventive regimes to reduce their risk for acute as well as chronic complications (e.g., radiation caries and ORN) associated with RT (**Table 4**).^{19,20}

Topical prescription fluoride therapy should be started as early as possible. It is best accomplished using carrier delivery trays (see **Table 5**) to deliver either a 1.1% neutral fluoride gel or a 0.4% stannous fluoride gel on a daily basis.²⁰ Alternatively, a brush-on technique may be used to deliver the fluoride. Professional in-office fluoride applications (e.g., rinses, varnishes) should be administered on a scheduled basis. OTC fluoride rinses are less effective than prescription fluoride gels and rinses but may also be used by the patient

The decision to extract teeth prior to RT must consider the reality that RT is likely to compromise oral health. In addition to nonrestorable teeth, teeth at significant risk for future infection and/or breakdown that would necessitate aggressive or invasive intervention during or after RT should be considered for pre-therapy extraction.^{8,19} A minimum of two to three weeks of healing time is desirable before initiating RT. There are no firmly established guidelines addressing when to extract, but the following conditions should prompt consideration to extract:

- Teeth with large carious lesions encroaching upon the pulp

- Teeth with periradicular involvement evident on radiograph
- Teeth with periodontal pockets > 6mm and evidence of active disease (bleeding on probing)
- Teeth with excessive mobility (Class 2 or 3) or furcation involvement (Grade II, III, IV)
- Partially erupted teeth (third molars)
- Lack of patient motivation/concern, or the ability to regularly clean their teeth

Chemotherapy Associated Direct Mucosal Toxicity and/or Myelosuppression

Since the oral complications associated with CT and/or myelosuppression tend to resolve after the

cessation of CT, the goal of dental clearance is to teach the patient effective oral hygiene techniques and eliminate, or stabilize, oral disease likely to occur during chemotherapy through the first month after completion.^{8,19} Sources of potential systemic infection (e.g., deep caries, pulpal exposures, active periodontal disease) should be addressed, and possible sources of irritation (e.g., rough edges of restorations, chipped teeth) should also be corrected. Orthodontic brackets and appliances should be removed before therapy, and the wearing of removable prostheses should be avoided during therapy. Denture use should be restricted to eating and holding medications as necessary during therapy. All dental care should be coordinated with the managing physician.

Table 4 - Caries Risk Reduction Protocol²⁰

- Avoid drinking cariogenic liquids (e.g. soft drinks, carbonated drinks, including citrus flavored drinks or carbonated water, any liquid containing sugar)
- Avoid using sugar-containing mints or gums
- Avoid frequent between meal snacks that contain large amounts of sugar
- Understand the difference between sugar-free and sugarless products. Only the former do not contain sugar and should be used by dry mouth patients
- Avoid using mouth moistener agents with an acidic pH
- Do use products containing xylitol (mints, gums, and/or drinks)
- Perform thorough oral hygiene measures using a soft/medium toothbrush and floss or a proxy-brush (if sufficient space exists), and a fluoridated toothpaste (1100 ppm fluoride ion) at least twice per day
- Brush teeth after every meal or snack
- Use a prescription topical fluoride gel daily
- Commit to regular and periodic follow-up dental examinations on a schedule determined by your clinician

Table 5 - Fluoride Gel Instructions²⁰

- Place a ribbon of the prescribed fluoride gel in the carriers
- Insert both the upper and lower carrier
- Gently bite several times to "pump" gel between the teeth
- Leave the carriers in place for 5 to 10 minutes
- Remove carriers and expectorate the gel but do not rinse
- Rinse and lightly brush the carriers - store them as directed by your clinician
- Do not eat or brush for at least 30 minutes (optimal time to use is prior to bedtime)

Oral Assessment and Care During Therapy

The primary goal of dental therapy during cancer therapy is to maintain oral hygiene and address acute complications as necessary. Specific protocols vary among institutions, with the management of oral complications most often under the purview of the oncology nurse. Since patients undergoing outpatient cancer therapy may seek dental care from their dentist, all providers should be familiar with the following information.

Oral Hygiene

Meticulous toothbrushing with a moist, soft nylon-bristled brush (foam toothbrushes are not generally recommended) and atraumatic flossing is encouraged.^{8,21} Toothbrushing should occur 2-3 times daily using a bland dentifrice (e.g., children's toothpaste), and flossing should occur daily. A prescribed fluoride gel should be applied daily. The liberal use of a bland oral rinse (e.g., 0.9% normal saline, sodium bicarbonate solution, 0.9% saline/sodium bicarbonate solution) helps to ameliorate discomfort and assists with cleansing.

Mucositis

A stepped approach is recommended for the patient with oral mucositis to provide atraumatic cleansing, maintain lubrication, and control discomfort. The patient should avoid spicy, acidic, rough, and hot foods. Ameliorating topical agents, including the bland rinse agents noted above, mucosal coating agents, lubricating agents, topical anesthetics, and coating agents (see **Table 6**) may be used as necessary.⁸ Solutions containing varying amounts of diphenhydramine, viscous lidocaine, and corticosteroid mixed into a carrier vehicle such as bismuth subsalicylate (Pepto-Bismol®) may assist in managing mild to moderate mucositis.⁷ Hydrogen peroxide (3% diluted 1:1 with water) may help remove hemorrhagic debris, but its use should be restricted to 1-2 days, as it may delay wound healing.⁸

The keratinocyte growth factor-1 agent, palifermin, is Food and Drug Administration (FDA) approved to decrease the incidence and duration of severe oral mucositis in patients undergoing high-dose chemotherapy with or without radiation therapy

(to be followed by bone marrow transplant) for hematologic cancers.²¹ The use of palifermin to manage the mucositis associated with OCC and OPC therapy has yet to be approved by the FDA. Honey, both topical and ingested, is suggested for the prevention of mucositis.²¹ The use of low-level energy laser and light therapy (Photobiomodulation [PBM]) is recommended to prevent oral mucositis in the patient undergoing head & neck RT with or without CT.²¹ However, PBM has significant limitations. It requires specialized training, is expensive, not readily available in many cancer centers, and there is insufficient data to support its use in treating established oral mucositis.²²

Based on new evidence, agents that are no longer recommended to manage mucositis are summarized in **Table 7**.

Xerostomia

Intrathrapy xerostomia is primarily managed with palliative saliva substitutes (lubricating agents and ice chips). The main measure used to reduce the long-term risk of xerostomia associated with RT is parotid sparing intensity-modulated radiation therapy (IMRT).^{8,15,16,18} Other measures that may be attempted include surgical transfer of one submandibular gland to an area outside the radiation portal.^{6,12,24}

Infection

Most oral infections are attributed to CT-induced neutropenia.⁸ Approximately 31% of CT and/or head and neck RT patients will experience an oral candida infection during therapy.⁸ Patients who experience prolonged neutropenia (neutrophil count <1,000/mm³ for >7 days) are at higher risk

Table 6 - Available Agents for Mucositis Management⁸

Step 1 - Bland Rinses	Step 2 - Topical Anesthetics
0.9% saline solution - Sodium bicarbonate solution 0.9% saline/sodium bicarbonate solution	- Lidocaine (viscous, ointments, sprays) - Benzocaine (sprays, gels) - Dyclonine HCl (0.5% or 1.0%) - Diphenhydramine solution
Step 3 - Mucosal Coating Agents	Step 4 - Analgesics
- Amphojel® - Kaopectate® - Hydroxypropyl methylcellulose film-forming agents - Gelclair® - Caphosol - Episil - MuGard - Use of mixtures (topical anesthetics with mucosal coating agents) may be beneficial	- Opioid drugs: oral, intravenous (e.g., bolus, continuous infusion, patient-controlled analgesia), patches, transmucosal. - Morphine mouthwash (0.2%) may be used in patients receiving chemoradiation for head and neck cancer. - Transdermal fentanyl may be given to patients receiving conventional or high-dose chemotherapy, with or without total body irradiation

Table 7 - Agents Not Recommended for Mucositis Management^{8,21}

- PTA (polymyxin, tobramycin, amphotericin B) gel - BCoG (bacitracin, clotrimazole, gentamicin) gel - Isegran antimicrobial mouthwash - Sucalfate mouthwash - Intravenous glutamine

of developing serious infectious complications. Both indigenous oral flora and hospital-acquired pathogens have been implicated in bacteremia and systemic infection. Any suspicion of infection, such as fever of unknown origin, must be thoroughly investigated by the oncology team to determine the specific etiology and appropriate therapeutic intervention. During the period of neutropenia, elective dental care should be deferred.¹⁹ For a dental emergency, necessary care should be coordinated with the patient's oncologist.

Pain

The level of pain experienced by the patient during therapy appears to correlate with the severity of the mucositis.^{6,9} Unfortunately, cancer therapy-related pain is often underappreciated and undertreated. Currently recommended management protocols for mucositis pain are multidimensional (**Table 6**).^{8,23} Adjuvants may be prescribed to calm fears and anxiety. To maximize efficacy, drugs should be given "by the clock", rather than "on demand."

Oral Assessment and Care After Therapy

Patients who have completed successful cancer therapy should be encouraged to continue obtaining necessary dental care. It is often after the completion of cancer therapy that the general practitioner encounters the patient for the first time. While some patients experience no long-term complications related to their cancer therapy, many do. In 2022, the number of OCC and OPC survivors in the United States exceeded 452,000, and most had undergone RT as part of their treatment.²⁵ As such, most of these patients experience some degree of chronic oral compromise that adversely affects their quality of life.

An overarching goal in managing the post-RT patient is to optimize oral health and reduce the risk of ORN.^{8,19} The patient should be placed on a frequent recall schedule (every 3-6 months, interval determined by patient's needs) to assess the patient's oral health and their compliance with home care (see **Tables 4 and 5**).¹⁹ Monitoring for complications (compromised mucosa, salivary dysfunction, infection, altered taste, pain, and osteonecrosis) should be accomplished at each periodic exam.

Compromised Mucosa

Post-radiotherapy healed mucosa is less pliable and prone to future irritation and ulceration. Oral dryness further aggravates discomfort, with some patients complaining of a burning or scalded sensation.⁶ The use of removal prostheses to restore form and function remains a topic of debate, mainly over the concerns that they may "rub" the tissues and increase the risk of ORN. However, a recent review suggests that well-designed and fitted prostheses are well tolerated.²⁶ Using implants to restore form and function remains another option and should be considered for select patients.²⁷ In these cases, consideration of the radiation dose to the potential implant site can be the deciding factor influencing the decision to place an implant.

Salivary Dysfunction

Measures to relieve xerostomia are summarized in **Table 8**. There is no "one size fits all" formula and each patient should actively participate in determining what works best.^{6,7,12,20} The use of a room humidifier to increase room humidity, especially during sleep, may improve comfort.

Infection

Managing the life-long increased risk of oral infection in this patient cohort represents a serious challenge for the dental clinician.^{6,7} The challenge emanates from the fact that active periodontal disease, as well as surgical interventions, place the patient at increased risk for ORN. The progression of radiation caries can also be profound and place the patient at risk for needing extraction, potentially triggering ORN.

Oral candida infections (e.g., erythematous candidiasis, pseudomembranous candidiasis, angular cheilitis) occur commonly, particularly in patients with oral dryness.⁶ Due to oral dryness, topical therapies may be poorly tolerated, necessitating systemic therapy. Recommended antifungal therapy:²⁸

Topical:

Rx: Miconazole mucoadhesive buccal tablets 50 mg (Oravig®)

Disp: 14 tablets

Sig: Apply one tablet to the upper gum region (canine fossa) once daily for 14 consecutive days.

Systemic:

Rx: Fluconazole (Diflucan®) 200 mg tablets

Disp: 15 tablets

Sig: 2 tablets on day 1, then 1 tablet daily

Table 8 - Measures to Manage Xerostomia^{10,15,20}

Measure	Examples	Comments
Topical stimulation of salivation	- Sugar-free gum - Sugar-free mints	Xylitol containing products should be used
Moisturizers	- Sip water - Water mist - Saliva substitutes	- Formulations vary - Liberal use - Variable patient acceptance - Avoid products with pH < 6
Sialagogues	- Pilocarpine (Salagen®)* - Cevimeline (Evxac™)**	- Common side effects include sweating, headache, nausea, gastrointestinal upset, urinary frequency, rhinitis, flushing - Allow 7 days between dosing changes to determine overall effect and tolerance. Allow up to 8 weeks to establish effect.

* FDA approved indication

** Off-label indication

Increased caries risk is mainly attributable to compromised salivary function and subsequent changes in the oral microflora. In some cases, the measures recommended in **Tables 4 and 5** are insufficient to control caries. In this situation, the clinician may consider additional measures to improve caries control (**Table 9**). It should be noted that the research to support these recommendations is limited.

Altered Taste

The post-radiotherapy patient may experience persistent taste diminution.^{6,7} Efforts to improve altered taste are limited. They include:

- Efforts to improve salivation and oral cavity wetness
- The use of flavoring agents with foods
- Zinc supplements

Pain

Some mucosal discomfort may persist due to mucosal damage and persistent oral dryness. Consistently satisfactory therapies to alleviate

this complaint are lacking. Primary management strategies include the dry mouth therapies noted above. Irritating substances such as spices, alcohol, and rough foods should be avoided.⁸

Osteonecrosis

Efforts to reduce the risk for ORN focus on maintaining oral health and avoiding, when possible, surgical interventions and oral infections.^{6,14-16} Endodontic therapy and crown amputation should be considered to avoid tooth extraction, and should be performed as atraumatically as possible with minimal amounts of local anesthetic containing epinephrine.

If ORN does occur, referral to an oral and maxillofacial surgeon is recommended. Management strategies are patient-specific and vary from simple measures to optimize oral hygiene, combined with simple sequestrectomy, to extensive resective surgery to remove devitalized bone, followed by osseous reconstruction.^{5,15}

Summary

Medical therapies to treat OCC, OPC, and some extraoral cancers may cause debilitating acute and chronic complications affecting the oral cavity and oropharynx. The oral healthcare provider plays an integral role in the multidisciplinary approach to prevent and manage these complications in at-risk patients. Management is divided into three stages:

1. oral assessment and therapy before initiation of cancer therapy,
2. oral supportive care during cancer therapy, and
3. oral care after the completion of cancer therapy.

Implementation of these management protocols is vital in assisting the patient in maintaining a high quality of life before, during, and after cancer therapy.

Table 9 - Additional Measures to Control Caries

More frequent recall
An antimicrobial protocol²⁰ consisting of: • A two-week course of 0.12% chlorhexidine rinse (½ ounce rinse) for one minute, twice daily • Followed by ½ ounce rinse for one minute twice daily, one or two days per week. This regime is postulated to reduce the burden of <i>mutans streptococci</i>
Use of silver diamine fluoride in non-esthetic areas (staining)
Use of remineralization products such as: • casein phosphopeptide-amorphous calcium phosphate (CPP-ACP) • hydroxyapatite / nano-hydroxyapatite • arginine

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POST-TEST

Internet Users: This page is intended to assist you in fast and accurate testing when completing the “Online Exam.” We suggest reviewing the questions and then circling your answers on this page prior to completing the online exam.

(1.0 CE Credit Contact Hour) Please circle the correct answer. 70% equals passing grade.

1. Which of the following adverse oral complications associated with radiation therapy for oral cavity cancer is characterized solely as chronic?
 - a. Mucositis
 - b. Osteonecrosis
 - c. Infection
 - d. Pain
2. Upon healing, radiation-induced mucositis is likely to manifest all of the following features in the mucosa except one. Which one is the exception?
 - a. More prone to ulceration
 - b. Less thickened
 - c. More pliable
 - d. More atrophic
3. Salivary dysfunction attributed to RT may be permanent and typically is only observed after the cumulative radiation dose to the salivary tissues exceeds 50Gy.
 - a. The first part of the statement is true, but the second part of the statement is false.
 - b. The first part of the statement is false, but the second part of the statement is true.
 - c. Both parts of the statement are true.
 - d. Both parts of the statements are false.
4. Concerning ORN, which of the following statements is incorrect?
 - a. ORN is considered the most serious complication associated with radiotherapy.
 - b. ORN presents as exposed necrotic bone and the posterior mandible is the most commonly affected site of occurrence.
 - c. The over-all risk of occurrence is 5%.
 - d. ORN only occurs after inappropriate dental manipulation of the osseous tissues (e.g., extraction, periodontal therapy).
5. Of the available patient-applied fluoride agents, which are considered most effective?
 - a. 1.1% neutral fluoride gel
 - b. 0.4% stannous fluoride
 - c. OTC fluoride rinses
 - d. a & b
 - e. a, b & c
6. Your patient presents for a pre-treatment dental assessment and therapy before undergoing mucositis-inducing chemotherapy. You determine the patient has a deep carious lesion in an otherwise restorable tooth. This tooth should be extracted.
 - a. True
 - b. False
7. The decision to remove teeth prior to the initiation of cancer therapy is based on the findings of a thorough oral examination. Examples of conditions that should prompt consideration for extraction include:
 - a. Evidence of radiographic periradicular involvement without symptoms
 - b. Periodontal pockets < 2mm
 - c. Erupted third molars
 - d. a & c
 - e. a, b, c
8. For the patient undergoing immunosuppressive chemotherapy, a significantly increased systemic risk is associated with a neutrophil count of:
 - a. > 2,000/mm³ for < 7 days
 - b. < 2,000/mm³ for > 7 days
 - c. < 1,000/mm³ for > 7 days
 - d. > 1,000/mm³ for < 7 days
9. Oral infection creates the greatest risk in which of the following cancer therapy scenarios:
 - a. Immunosuppressive chemotherapy to manage leukemia
 - b. Combined chemoradiation therapy to manage a base of tongue cancer
 - c. Surgical resection of a small lower lip cancer
 - d. Surgical resection of a soft palate cancer with follow-up IMRT
10. PBM is not recommended for the prevention of oral mucositis in patients undergoing head and neck RT with or without CT, but is recommended for mucositis treatment.
 - a. The first part of the statement is true, but the second part of the statement is false.
 - b. The first part of the statement is false, but the second part of the statement is true.
 - c. Both parts of the statement are true.
 - d. Both parts of the statements are false.

