



UKOMiC

UK Oral Management in Cancer Care Group

Oral Care guidance and support in cancer and palliative care

Third Edition



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1.0 Introduction

The United Kingdom Oral Management in Cancer Group (UKOMiC), is a multi-professional group of oral care experts working in oncology and haematology from across the United Kingdom who have come together with the aim of improving oral care in clinical practice. Mindful of the many developments in cancer care aimed at improving survival and quality of life, the correct and consistent approach to managing the multiple oral care problems that can arise still remains a challenge in many clinical settings (Table 1). There is much evidence to show that many clinical settings rather than taking a proactive approach to this aspect of care, still simply react to oral complications once they occur with a sometimes inconsistent and anecdotal approach (Elad et al 2014, Quinn et al 2016).

Using the existing guidelines and guidance from other countries, international organisations (MASCC, EOCC, ESMO) the current evidence and their own clinical expertise the group developed this clinically applicable guidance to inform practice in the prevention and treatment of oral problems secondary to malignant disease and treatments including systemic treatments, radiation and supportive therapies.

Being engaged in addressing and managing oral care in cancer in clinical practice, delivering lectures and workshops, working alongside other national and international clinical groups, UKOMiC have brought together this third edition of clinically based oral care guidance.

Table 1: Oral complications in the cancer setting (Quinn et al 2016)

- Ulceration
- Lesions
- Infection
- Inflammation
- Taste changes
- Dry mouth
- Bleeding
- Trismus
- Halitosis
- Dental decay
- Osteonecrosis
- Fibrosis
- Oral Graft versus host disease
- Pain

1.1 Purpose of the Guidance

Cancer and the treatment required, directly impact on the patient with cancer in a multitude of ways which may include changes to the oral cavity affecting their well-being, potentially causing severe acute and long-term physical, psychological and social problems (Table 2)

Table 2: Personal impact

- Personal distress
- Impact on curative treatment
- Increased morbidity
- Malnutrition/dehydration
- Inability to sleep
- Long term complications
- Increased length of stay
 - (Quinn et al 2016)

Oral problems and damage may be temporary or permanent resulting in a significant health burden for the individual while making substantial demands on limited health care resources. However, oral complications are not always inevitable and much can be done to reduce or minimise the severity of symptoms by taking a more proactive approach to this aspect of care. Critically examining current evidence and clinical practice, UKOMiC estimate that the health burden on the individual and the demands on health care resources can be greatly reduced by the correct assessment, preventative measures, care and treatment of oral problems. This guidance will assist teams in both planning and implementing oral care thereby preventing or reducing the severity of this side effect of disease and treatment.

Working as a multi-disciplinary team with the patient at the centre of care and treatment plans, the early detection of potential and actual problems through the correct assessment, and treatment plan with active intervention can help to reduce oral problems, prevent interruptions to cancer treatment plans and maximise patient safety and comfort. Each of these factors needs to be critically considered while applying the principles set out in this guidance.

One of the major challenges is the need to correctly and consistently address the damage caused by oral mucositis (OM). OM has been defined by Al-Dasooji et al (2013) as the Inflammation of the mucosa membrane, characterised by ulceration which may result in pain, dysphagia and impairment of the ability to talk. The mucosal injury caused by OM provides an opportunity for infection to flourish, and in particular putting the severely immunocompromised patient at risk of sepsis and septicaemia.

1.2 Incidence of Oral damage

The incidence of oral damage in the cancer setting is much higher than previously thought and while OM can be expected to occur in at least 45-50% of patients undergoing chemotherapy or targeted therapy to treat a solid tumour, (Sonis et al 2004, Li & Tovato 2012, Elad et al 2014) the incidence of oral damage is likely to be much higher (Quinn et al 2016). Over 95% of patients undergoing haematopoietic stem cell transplantation (HSCT) are thought to be affected by OM and oral damage (Elad et al 2014). Kostler et al (2001) estimate that as many as 97% of all patients receiving radiotherapy (with or without chemotherapy) for head and neck cancers will suffer from some degree of OM. With the increasing use of targeted drug therapies and approaches, problems in the oral cavity may increase and become even more of a challenge (Quinn et al 2015). Correct preventative measures can help reduce the burden of oral damage caused by these agents and targeted approaches.

Table 3: Incidence of oral damage

- Standard chemotherapy (5%-10%)
- TKI, mTORI (45%)
- Myelosuppressive chemotherapy (50%)
- Head & Neck (RT/CT) (50%-97%)
- Haemopoietic Stem Cell Transplant (HSCT) (68% - 98%)

(Kostler et al 2001, Rose-Ped et al 2002, Elting et al 2003, Filicko et al 2003, Trotti et al 2003, Sonis et al 2004, Bhatt et al 2010, Boers-Doets et al 2011, Li & Tovato 2012, Peterson 2015, Hannen et al 2017)

2.0 Assessment of the Oral Cavity

All treatment strategies aimed at improving mouth care are dependent on four key principles: accurate assessment of the oral cavity; individualized plan of care, initiating timely preventative measures and correct treatment, (Quinn et al 2008). The assessment process should begin prior to treatment by identifying patient risks and treatments most likely to cause oral damage (Table 4 and 5)

Table 4:
Examples of systemic cancer treatment agents known to cause oral damage

Targeted Agents	Chemotherapy	Chemotherapy
Pertuzumab	Docetaxel	Melphalan
Gemtuzumab	Capecitabine	Methotrexate
Trastuzumab	Carboplatin	Mitomycin
Trastuzumab emtansine	Cisplatin	Mitoxantrone
Pazopanib	Daunorubicin	Oxaliplatin
Everolimus	Doxorubicin	Paclitaxel
Temsirolimus	Epirubicin	Pemetrexed
Erlotinib	Etoposide	Pentostatin
Sunitinib	Fluorouracil	Thiotepa
Sorafenib	Idarubicin	Topotecan
Bevacizumab	Irinotecan	Vinblastine
	Lomustine	Vincristine
		Vinorelbine

Boers-Doets et al 2011, Johnson 2017, Haanen et al 2017

Table 5: Bone modifying agents (BMAs) that may affect teeth and oral cavity

- Alendronic acid
- Zolendronic acid
- Ibandrononic acid
- Risedronate sodium
- Pamidronate sodium
- Sodium clodronate
- Denosumab

2.1 The Assessment

Each patient also needs to be assessed in relation to other risk factors (Table 6) including patients with pre-existing dental problems, older patients are at higher risk of oral damage from cancer treatments, patients who have a history of alcohol and or tobacco use may already have oral damage, patients suffering from poor nutrition and dehydration and patients receiving other supportive therapies that may cause dryness or a change in the normal mucosal environment including BMAs, opiates diuretics, sedatives, oxygen therapy and feeding tubes.

Table 6: Some risk Factors

- Older patients
- Poor oral/dental health
- Poor nutrition/hydration
- Co-morbidities (e.g. diabetes)
- Inability to perform oral care
- Malignant oral disease
- Prior systemic anti-cancer treatments (SACT)
- Supportive therapies (including BMAs - Table 5)

Mouths should be assessed by trained health care professionals using a recognized grading system (Quinn et al 2005). The expert group recommends using a recognized oral assessment grading system (Appendix 1) to ensure accurate monitoring and record keeping. The tool chosen will depend on the clinical situation but should contain both objective and subjective elements. The assessment should include changes to the oral mucosa, the presence or absence of pain, the patient's nutritional status and the level of fatigue.

Assessments should be completed at regular intervals to monitor interventions, and documented in the medical/nursing records. Patients undergoing regimens with a high risk of oral mucositis should have daily assessments. Patients should be encouraged to assess their own mouth and to report any changes they notice or experience to their medical team or key worker. The oral cavity should be reviewed when a patient visits the hospital for any chemotherapy, targeted therapy, radiotherapy to the head and neck region or following head and neck surgery (Quinn et al 2015). Assessment should also contain continuing patient education.

Strongly recommended (Quinn et al 2016)

- OM should be assessed using a standardized protocol comprising the use of a valid and reliable instrument.
- OM assessments should use instruments or a combination of suitable scales containing elements covering physical changes in the oral mucosa, functional changes and subjective changes (most commonly used are World Health Organization (WHO) and the National Cancer Institute Common Toxicity Criteria (NCI CTC).
- OM assessments should continue after the end treatment until OM is fully resolved or the trend to resolution is established (Fig: 1).

Recommended based on expert opinion

A comprehensive baseline dental and oral assessment should be made prior to treatment, where OM is expected. A further baseline assessment of OM should be undertaken as close to the administration of the first treatment dose as possible. Any identified dental problems should be corrected before starting treatment regimen (British Dental Health Foundation 2015).

The use of pain scoring, in relation to changes in the oral cavity, should form part of the OM assessment

Clinicians assessing patients should be specifically trained in the application of the scale. Periodic inter-rater reliability should be used to monitor the need for staff training.

2.2 Frequency of oral assessment

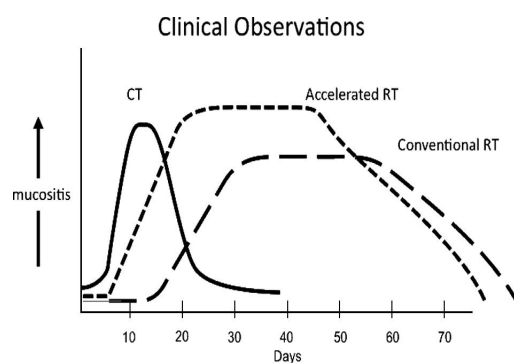
Inpatients: all patients at risk of oral mucositis require a baseline assessment

Patients with oral mucositis: daily oral assessment.

Outpatients: all patient at risk of oral mucositis require a baseline assessment

Patients with oral mucositis: during every clinical visit, consider guiding the patient to use a self-assessment instrument at home.

Fig: 1 Conventional chemotherapy-induced oral mucositis usually develops within 4-7 days after initiation of treatment and peak within 10 to 14 days. The accumulation of mucositis in radiotherapy patients may be slower than chemotherapy due to fractionated treatment. Radical radiotherapy fraction sizes can be in the region of 2-2.75 Gray (Gy) per day for 4-7 weeks. Radiation-induced oral mucositis typically begins at cumulative doses of about 15 Gray (Gy) but oral damage can be seen in much lower doses increasing in intensity with treatment requiring higher doses of radiotherapy. Radiotherapy reactions can take many weeks to months to resolve (Li and Tovato 2012).



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With the increasing use of intensity modulated and proton beam radiotherapy for some patients with head and neck cancer the clinical presentation of oral problems may change however patients will continue to develop xerostomia and mucositis in this setting (Frank et al 2014).

3.0 Care of the Oral Cavity

What comprises the oral care team may vary for every healthcare setting. Most often, this team consists of: dental professionals, dietitian, nurse, doctor and pharmacist. The support provided by the team as well as good communication with patients are key to maintaining patient's oral health.

3.1 Patient education

- All patients should be provided instructions and encouraged to maintain good oral hygiene. Education should also include potential oral complications to enable patients to identify and report these early (Elad et al 2014)
- All patients should receive written information, as well as verbal instruction about oral care as part of the prevention and treatment of oral changes. Patient education should be carried out in advance of treatment commencing and regularly during treatment and after the completion of treatment. Education should also include dietary requirements and advice.

3.2 Dental assessment

- Patients, particularly those who are about to commence haematopoietic stem cell transplantation (HSCT) and head and neck radiation treatments, should undergo dental assessment by a specialist (Elad et al 2014, PHE 2014, Quinn et al 2016). This is to establish general oral health status and identify and manage existing and/or potential source of infection, trauma or injury. Some patients may need regular dental follow-up throughout and after treatment.
- Depending on patients' oral health, they may need regular reviews with a dental professional before, during and after treatment (Elad et al 2014).

3.3 Nutritional screening and choice of foods

- Good nutrition is vital in helping to fight infection, maintain mucosal integrity, enhance mucosal tissue repair and reduce exacerbation of existing mucositis. All patients should be nutritionally screened and referred to a dietitian as appropriate. Issues that may affect nutrition such as loss of appetite, taste changes and dysphagia should be assessed. Referral to a speech and language therapist may be necessary to assess dysphagia.
- There are certain foods that can damage the oral mucosa. Hot food and fluids as well as rough, sharp, hard foods can damage the oral mucosa therefore should be avoided. Spicy, very salty, and acidic foods may cause mucosal irritation but may be preferred or tolerated by some patients.

Dental Care

3.4 Brushing

- Depending on oral status, gentle brushing of teeth, gums and tongue should be performed two to four times a day preferably after meals and before going to bed (Peterson et al 2015). Soft-bristled toothbrush (manual or electric) is recommended to prevent injury to the oral mucosa; excess toothpaste should be spat out not rinsed after brushing. (PHE 2017), toothbrush must be rinsed thoroughly with water after each use. To enhance plaque removal, small circular brushing movements are recommended (Poyato-Ferrera et al 2003, PHE 2014, Peterson et al 2015). If the mouth is painful or patients cannot open their mouths fully, single use oral sponges may be used with caution (Quinn et al 2016). However, oral sponges are not effective for plaque control or prevention of dental caries, and should not be considered as an alternative for brushing.
- To prevent infections, toothbrush should be stored with the brush head upwards and not soaked in disinfectant solution. Toothbrush should be changed regularly

every month or more frequently in relation to patient's infection risk. These should also be monitored for evidence of fungal/bacterial colonisation.

- In order to protect the enamel, low abrasive toothpaste containing mild fluoride (1000-1500 ppm) should be used. Many patients undergoing treatment for cancer will benefit from using higher fluoride content (over 1500 ppm) to prevent caries (Newburn 2001). Consider Duraphat 5000ppm or Duraphat 2800ppm (PHE 2017). If considerable oral discomfort consider Oranurse 1450ppm, Bioextra Dry Mouth Mild toothpaste, Oralieve toothpaste, Xerostom toothpaste or Biotene toothpaste.
- Patients should follow the dose fluoride content (of toothpaste) as prescribed by the oral care team. Ensure that patients can tolerate the flavour. For example, some patients may not be able to tolerate toothpaste with mint.
- Some patients may have contraindications to some ingredients, ethical or religious reasons for refusing some products and these must be taken into account.

3.5 Interdental cleaning

- Daily dental flossing and/or use of interdental cleaners (including dental picks) may reduce plaque formation between teeth (Sambunjak et al 2011, Poklepovic et al 2015, Imai et al 2012, British Dental Health Foundation 2015). However, it must be ensured that patients are able and confident in their use to prevent mucosal injury. Flossing and the use of interdental cleaners should be used with caution for patients with thrombocytopaenia or clotting disorders; and those receiving radiotherapy for head and neck cancer.

3.6 Dentures

- These should fit well as ill-fitting dentures cause movement that irritates the mucosa and breaks integrity. After each meal, dentures must be rinsed. Thorough cleaning by brushing with soap and water should be performed at least twice a day. Dentures should be cleaned, and stored in water in a closed container overnight (Duyck et al 2013).

3.7 Mouthwash

- The goal of using mouthwashes may include: oral hygiene, preventing/treating infection, moistening the oral cavity or providing pain relief. As a minimum to keep the mouth clean, bland rinses with water, normal saline (0.9% NaCl) or saltwater are recommended to be gargled at least four times a day (Lalla et al 2014). It is recommended that mouth rinses are used at a different time to brushing in order to not reduce the benefit of the toothpaste (PHE: DBOH 2017).

- It is vital that clinicians assess the ability and confidence of patients using mouthwashes. Some patients may require assistance and it may be necessary for healthcare professionals to perform/support oral care including thorough rinsing with normal saline (0.9% NaCl) and/or bicarbonate solutions, with or without suction (Elad et al 2014).

3.8 Alcohol and smoking

- Alcohol and tobacco damages the oral mucosa. Advice should be provided to help patients gradually minimise or avoid these. If appropriate, patients may be offered more information about smoking or alcohol cessation programmes (Elad et al 2014, Quinn et al 2015).

3.9 Dryness of lips and mouth

- Patients should maintain adequate hydration and drink water frequently to keep the mouth moist. Several factors could contribute to dryness such as oxygen therapy, medications (e.g. antidepressants, antihistamines, phenytoin, steroid inhalers and opioids); patients who are older or terminally ill are more prone to dryness of the lips and mouth.
- Lubricants such as Vaseline/white paraffin, lip balm or lip cream may be used to moisten the lips. Water-soluble lubricants should be used for patients who are undergoing radiotherapy of the head and neck; and those receiving oxygen therapy (Quinn et al 2008).
- To keep the oral mucosa moist, regular sipping or spraying water may help. Use of saline sprays and mouthwashes as well as use of saliva substitutes may be used. Some saliva substitutes may have acidic pH that could affect the teeth, therefore use products with neutral pH or contains fluoride, if indicated. Some saliva substitutes also contain animal components, thus must be checked with patient's preference. Sugar-free gum may stimulate saliva production. There is anecdotal evidence that fresh pineapple chunks may also help stimulate saliva (Lalla et al 2014). Pineapple contains the anti-inflammatory enzyme bromelain and can soothe the mucosa lining of the mouth.
- Steam inhalation or nebulisers may help loosen thick secretions. Normal saline or sodium bicarbonate solutions may be used. Suctioning may be required to assist those who find getting rid of their secretions difficult, but must be used with caution as oral suctioning may cause mucosal injury.

Oral care and assessment should be performed routinely. Patients should be encouraged to observe their mouths and report changes early as changes in the patient's oral condition may require changes in oral care interventions.

4.0 Prevention of Oral Complications

In preventing oral complications, a personalised treatment plan should be developed with the patient and should consider the individual's personal needs, their previous oral care, their disease, and patient risk factors (Appendix 1)

Compliance with the prevention measures and good oral hygiene will help to minimise or reduce the risk of subsequent issues with mucositis and oral damage (Quinn et al 2008).

The choice of prevention regimens will depend on the perceived risk of oral damage.

Risk Classification: Level 1

Patients with no known prior oral complications.

Patients who are receiving treatments not known to cause moderate or severe oral mucositis/oral complications.

Interventions

Encourage self-reporting of any oral changes.

Ensure accurate baseline assessment.

Good oral hygiene - all patients should be supported and encouraged to maintain good oral hygiene (Elad et al 2014, Quinn et al 2016).

Smoking cessation - provide advice and support prior to commencing cancer treatment.

Hydration - encourage regular fluid intake.

Plaque reduction - a soft or medium toothbrush with high fluoride containing toothpaste/foam/gel is recommended to prevent dental caries (Royal College of Surgeons of England/ The British Society for Disability and Oral Health 2018).

Encourage interdental cleaning (Sambunjak et al 2011).

Salt water mouthwash - 1 teaspoon salt to added 900ml of cold or warm water (Elad et al 2014, Quinn at al 2016). Salt water mouthwashes to be swilled and gargled at least four times in 24 hours to clean the mouth and remove debris. A fresh supply to be made daily. Each salt water rinse (patients in hospital may use 0.9% sodium chloride from a vial) to be followed by rinsing with cold or warm water.

Nutritional assessment and referral to a dietician where appropriate (Elad et al 2014).

Risk Classification: Level 2

Patients with a previous history of oral mucositis or oral damage.

Patients receiving SACT known to cause oral mucositis and/or other complications.

Low dose radiation to the head and neck region (palliative setting).

Pharmacological agents and/ or co-morbidities predisposing the patient to dry mouth.

The very young and the elderly.

Interventions

In addition to the preventative interventions for level 1, consider:

Increasing the frequency of saline mouthwashes.

Cryotherapy/sucking ice chips are recommended for 5 - fluorouracil bolus treatment and for high dose Melphalan (Lalla et al 2014). Swish ice chips in the mouth for 30 minutes, beginning 5 minutes before treatment is administered.

Oral rinses - Benzydamine 0.15% oral solution (Diffiam®) use 10 ml rinsed around the mouth and spat out 4 times a day (Lalla et al 2014). Caphosol® (4-10 times a day), recommended to start on the first day of chemotherapy or the first day of radiotherapy to head and neck region (Quinn 2013).

Consider mucosal protectants, including Episil®, Gelclair®, OraLife gel® MuGard®

Risk Classification: Level 3

Patients with previously moderate or severe oral mucositis or oral complications.

Patients who are undergoing surgery to the oral cavity or head and neck region.

Patients receiving high dose chemotherapy agents prior to HSCT.

Patients receiving high dose methotrexate and cytarabine containing regimens.

Radical radiation to the head and neck region.

Interventions

In addition to the preventative interventions for level 1 and 2, consider:

Nutritional support and assessment - referral to a dietician where appropriate. All patients should be nutritionally screened using a validated screening tool e.g. Malnutrition Universal Screening Tool (MUST) and those identified as being at risk should receive early intervention for nutritional support from an experienced dietician (Elad et al 2014)

All HSCT patients and all head and neck cancer patients should be reviewed by a dietician prior to commencing treatment, seen at regular intervals during treatment, and

may require on-going support after treatment is completed (Elad et al 2014, Quinn et al 2016)

Low level laser therapy (LLLT) (NICE 2018)

Anti-infective prophylaxis according to local policies/ guidance.

Daily Vitamin B supplements for patients with alcohol misuse issues

Anti-Infective Prophylaxis

Whilst good oral hygiene is fundamental, anti-fungal and antiviral treatments may be prescribed to prevent infections for patients who are immunocompromised including patients with haematological cancers who are receiving chemotherapy (according to local policies/guidance).

Infection prophylaxis for patients with head and neck cancers is generally only required if the patient is known to be at risk of infection due to known co-morbidity factors.

Anti-fungal prophylaxis should be given to patients receiving high-dose steroids (the equivalent of at 15 mg prednisolone or higher per day for at least once week), this may include 50 mg oral fluconazole once daily.

Higher risk patients, including those undergoing HSCT, should also receive an anti-fungal agent as a prophylaxis measure; this may include agents such as fluconazole, itraconazole or posaconazole given orally or intravenously for some patients (the choice of drug will be dependent on local policies/guidance) (Quinn et al 2016).

Anti-viral prophylaxis may comprise aciclovir or an equivalent three times a day orally (or according to local policies/guidance). Higher doses may be given to some haematology patients.

5.0 Treatment of Oral Complications

Treatment of oral complications is carried out by a multi-professional team this may include medical staff, dentists, oral hygienists, specialist nursing staff, pharmacists or therapeutic radiographers. Good communication and education of the patient is key to ensure any treatment provided gives maximum relief to patients. Patients should be assessed and monitored frequently during treatment.

All treatment plans should be based upon the grading of oral damage.

5.1 Mild/Moderate Mucositis/ Oral Complications

- Once oral damage develops patients should be supported to continue oral care.
- Frequency of oral rinsing maybe increased. The aim is to keep the oral surfaces clean and moist.
- Check for oral infections, swab and treat appropriately. Antifungal treatment, local or systemic should be administered if required
- Antifungal mouthwashes can be used in case of super infection with candida
- Dexamethasone containing gels may be used for aphthous lesions
- Consider mucosal protectants (Mugard, Oralife gel, Gelclair, Episil)
- Dietary requirements should be assessed and foods causing discomfort avoided.
- Swallowing problems, malnutrition and weight loss should be monitored and patients given support/advice. Adjustments to food consistency, methods of intake, food fortification and methods of intake should be assessed and support and education offered to patients. Use of supplement drinks, PEG, RIG or Nasogastric feeding should be considered.
- Fluid intake should be assessed and route of administration of pain relief continually monitored. General health problems should also be assessed (swallowing of medication, decreased blood sugar levels and decreased blood pressure, decreased renal function leading to overdosing of substances).
- Patients will need adequate pain medication including topical and systemic analgesia including - paracetamol, codeine, morphine mouthwash, Benzydamine mouthwash, trimecain, topical lignocaine. Patients should be offered education on use and possible side effects including numbness of the oral mucosa.

5.2 Severe Mucositis/Oral Complications

In addition to the recommendations for mild/moderate the following should be considered:

- Increase monitoring of the oral cavity.
- Increase systemic pain medication (see 5.3).
- Consider best route for patient- subcutaneous/intravenous analgesia (opiates), transdermal patches. Patients may require a combination of slow release and fast acting drugs.
- Continue monitoring and assess the effective of pain management and any potential side effects including patient fears/concerns.

5.3 Treatment of Specific Oral Complications

Managing pain

Analgesia, which may include dispersible paracetamol (tablets should be dissolved in water and used as a mouthwash before swallowing). It should be remembered that paracetamol may mask fever. Escalate to soluble co-codamol if required. The use of non-steroidal anti-inflammatory drugs may be contraindicated due to the risk of bleeding and renal impairment (Keefe et al 2007).

Consider Benzydamine 0.15% oral solution (Difflam®), 10ml rinsed around the mouth and spat out. Repeat as required. If the patient experiences stinging, dilute 10 ml of Difflam® with 10 ml of water prior to administration and use 10 ml. However, this may be poorly tolerated in patients receiving head and neck radiotherapy and any patient with severe mucositis.

The use of stronger analgesia, including Oxynorm®, Sevredol® and Oramorph® to alleviate pain may be required, (some liquid based analgesia may have an alcohol base which should be used with caution as it may cause irritation to the mucosa and increase in pain). If patients continue to experience pain from mucositis, consider using further opioid analgesia and review administration route, such as transdermal patches, patient-controlled analgesia or a syringe driver (seek advice from the acute pain team or the palliative care service).

Consider increasing Caphosol® frequency up to 10 times a day.

Consider applying a coating protectant, e.g. Episil®, Gelclair®, MuGard® OraLife gel®. The product should be rinsed around the mouth to form a protective layer over the sore areas, and generally applied 30-60 minutes before eating. These products are not to be swallowed.

Topical lignocaine gels such as instiligel can be used on specific lesions. Care to avoid rinsing around oral cavity or applying at back of oral cavity due to risk of aspiration.

Bleeding from OM

If there is associated bleeding in the oral cavity, consider using Tranexamic acid for injection or tablets (these can be added to 5ml water or dissolved). Use as a mouthwash every 4-6 hours to treat localized bleeding (Watson et al 2011). Carefully monitor patients on anti-coagulant therapy or who may be thrombocytopenic.

Xerostomia

Encourage sipping fluids.

Viscous solutions (e.g. caphosol) and (e.g. Xerotin) gels to protect and moisten the mucosa should be considered, patients should be counselled on correct application. In chronic radiotherapy related xerostomia, pilocarpine may be considered.

Trismus

This is a common side effect of surgery or during and after high dose radiotherapy to the head and neck. Patients should be given helpful exercises and the team may consider mechanical devices to help alleviate the problem. Input from the speech and language team is recommended.

Graft versus Host Disease (GvHD)

Mucositis and oral damage can be a hall mark of graft versus host disease (GvHD) in patients undergoing allogeneic stem cell transplantation. The presence of lichen planus like changes in the oral cavity may suggest the presence of GvHD (Demarosi et al 2005). Elad et al (2015) suggest that solutions of dexamethasone or other steroids are used as first line treatment, second line treatment may include solutions of steroids and other immune suppressant drugs.

5.4 Post Treatment Care/ Follow-up

After standard chemotherapy, most oral complications heal quickly no additional follow up is required.

Oral damage in the HSCT, head and neck radiotherapy/chemo-radiation setting will need several weeks/months to heal and patients need continuing support and care during this period. Advice and support by suitably qualified health professional should continue during this period.

Support to manage side effects including pain and the gradual reduction of analgesia is extremely important

Chronic side effects of radiotherapy – especially dental decay, osteoradionecrosis, trismus, fibrosis, lymphoedema, chronic xerostomia and chronic pain require careful management. All patients should be individually assessed and appropriate care and treatment given.

Patients receiving bone modifying agents are at risk of medication Related Osteonecrosis of the Jaw (MRONJ), this will require the oncology and dental teams to work together with the patient to minimise risk, further damage and the careful adjustment and monitoring of treatment plans

Follow up care should be planned and supervised especially in patients after radiotherapy and allogenic stem cell transplantation to address longer term and late complications.

Summary

The principles presented in this guidance are intended as a support and in no way should replace clinical decision making related to the particular patient and clinical situation. Depending on the severity of oral complications and the impact on the patient, the team will need to review the plan of care. Although this guidance and recommendations focus on the oncology and haematology setting the principles may be appropriate to the palliative care and the terminally ill setting.

References

Al-Dasoogi et N. et al (2013) Emerging evidence of the pathobiology of mucostis. Support Care Cancer 21:3233-3241

Bhatt, V., Ventrell, N. et al (2010) Implementation of a standardised protocol for the prevention and management of oral mucositis in patients undergoing haemopoietic cell transplant. J. Oncol Pharm Pract. Sept 16 (3) 195-204

Boers-Doets, C.B., Epstein, J.P., Raber-Durlacher, J.E. et al (2011) Oral adverse events associated with tyrosine kinase and mammalian target of rapamycin inhibitors in renal carcinoma A structured literature review. The Oncologist 17: 135-144

Boers-Doets, C. B. (2013) mTOR inhibitor-associated stomatitis (mIAS) scale. Supportive Care in Cancer. 21 (S1) S140

British Dental Health Foundation. <https://www.dentalhealth.org/tell-me-about/topic/caring-for-teeth> Accessed 20 December 2015.

Demarosi, F., Lodi, G., Carrassi, A. et al (2005) Oral malignancies following HSCT: graft versus host disease and other risk factors. Oral Oncol 41: 865-877

Duyck J, Vandamme K, Muller P, Teughels W. Overnight storage of removable dentures in alkaline peroxide-based tablets affects biofilm mass and composition. Journal of dentistry. 2013;41(12):1281-9

Eilers J, Berger AM, Petersen MC (1988) Development, testing, and application of the oral assessment guide Oncology Nursing Forum 15: 325-330

Elad S, Raber-Durlacher JE, Brennan MT et al (2015) Basic oral care for hematology–oncology patients and hematopoietic stem cell transplantation recipients: a position paper from the joint task force of the Multinational Association of Supportive Care in Cancer/International Society of Oral Oncology

(MASCC/ISOO) and the European Society for Blood and Marrow Transplantation (EBMT). Support Care Cancer (2015) 23:223–236

Elad S. et al (2015). Clinical approach in the management of oral chronic GVHD in a series of specialised medical centres. Supportive Care in Cancer vol 23(6) pp 1615 -1622

Elting LS, Cooksley C, Chambers M, Cantor SB, Manzullo E, Rubenstein EB (2003) The burdens of cancer therapy. Clinical and economic outcomes of chemotherapy-induced mucositis Cancer 98: 1531-1539

Epstein, J.B., Barasch A et al (2018) Oral and Dental Health in Head and Neck Cancer Patients. Cancer Treatment and Research

European Society for Medical Oncology (2017) Immunotherapy-related side effects and their management: An ESMO guide for patients. esmo.org

Filicko J, Lazarus HM, Flomenberg N (2003) Mucosal injury in patients undergoing hematopoietic progenitor cell transplantation: new approaches to prophylaxis and treatment Bone Marrow Transplantation 31: 1-10

Frank, S J et al (2014) Multi-field Optimization Intensity-Modulated Proton Therapy for Head and Neck Tumors - A Translation to Practice Int J Radiat Oncol Biol Phys. 89(4): 846–853.

Gussgard AM, Hope AJ, Jokstad A, Tenenbaum H, Wood R (2014) Assessment of cancer therapy-induced oral mucositis using a patient-reported oral mucositis experience questionnaire PloS one 9: e91733

Haanen et al (2017) Management of toxicities from immunotherapy: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow up. Annals of Oncology 28. 4 119-142

Imai PH, Yu X, MacDonald D. Comparison of interdental brush to dental floss for reduction of clinical parameters of periodontal disease. A systematic review. Can J Dent Hygiene 2012;46(1);63-78

Keefe DM, Schubert MM, Elting LS et al (2007) Mucositis Study Section of the Multinational Association of Supportive Care in Cancer and the International Society for Oral Oncology. Updated clinical practice guidelines for the prevention and treatment of mucositis. Cancer. Mar 1;109(5):820-31.

Kostler, W.J., Hejna, M., Wenzel et al (2011) Oral mucositis complicating chemotherapy and/or radiotherapy: options for prevention and treatment. *Cancer Journal for Clinicians* (51): 290-315

Kuten-Shorrer M, Woo SB, Treister NS (2014) Oral graft versus host disease. *Dent Clin North Am* 58:351-368

Lalla RV, Bowen J, Barasch A et al (2014) Mucositis Guidelines Leadership Group of the Multinational Association of Supportive Care in Cancer and International Society of Oral Oncology (MASCC/ISOO). MASCC/ISOO clinical practice guidelines for the management of mucositis secondary to cancer therapy. *Cancer*. 2014 May 15;120(10):1453-61.

Li, E. & Tovato (2012) New developments in the management of oral mucositis in patients with head and neck cancer or receiving targeted anticancer therapies. *AM J Health Syst Pharm* 69(12) 1031-1037

McCormack HM, Horne DJD, Sheather S (1988) Clinical applications of visual analog scales - a critical review *Psychol Med* 18: 1007-1019

McGuire DB, Peterson DE, Muller S, Owen DC, Slemmons MF, Schubert MM (2002) The 20 item oral mucositis index: reliability and validity in bone marrow and stem cell transplant patients *Cancer Invest* 20: 893-903

McGuire DB, Fulton JS, Park J, et al (2013) Mucositis Study Group of the Multinational Association of Supportive Care in Cancer/International Society of Oral Oncology (MASCC/ISOO). Systematic review of basic oral care for the management of oral mucositis in cancer patients. *Support Care Cancer*. Nov;21(11):3165-77.

Moore, S, Banerjee, A et al (2017) The role of the general dental practitioner in managing oral care in head and neck oncology patients. *Dental Update*.

Newbrun E (2001) Topical fluorides in caries prevention and management: a North American perspective. *J Dent Educ* 65(10):1078-1083.

Peterson DE, Boers-Doets CB, Bensadoun RJ & Herrstedt J (2015) Management of oral and gastrointestinal mucosal injury: ESMO Clinical Practice Guidelines for diagnosis, treatment, and follow-up. *Annals of Oncology* 26 (Supplement 5): v139-v151, 2015.

Public Health England (PHE) (2017) *Delivering Better Oral Health: an evidence based toolkit for prevention third edition*.

Poklepovic T, Worthington HV, Johnson TM, Sambunjak D, Imai P, Clarkson JE, et al (2013). Interdental brushing for the prevention and control of periodontal diseases and dental caries in adults. The Cochrane database of systematic reviews. 12.

Poyato-Ferrera M, Segura-Egea JJ, Bullon-Fernandez P (2003) Comparison of modified Bass technique with normal toothbrushing practices for efficacy in supragingival plaque removal. International Journal of Dental Hygiene 1(2):110-4.

Quinn, B., Botti, S., Kurstjens, M. et al (2016) European Oral Care in Cancer Group: oral care guidance and support: first edition.

Quinn, B et al (2015) UK Oral Mucositis in Cancer (UKOMiC) Guidelines, Second Edition

Quinn, B. (2013) Efficacy of a supersaturated calcium phosphate oral rinse for the prevention and treatment of oral mucositis in patients receiving high-dose cancer therapy: a review of current data. European Journal of Cancer. 22(5): 564-579

Quinn B, Potting CMJ, Stone R, Blijlevens NMA, Flidner M, Margulies A, Sharp L (2008) Guidelines for the assessment of oral mucositis in adult chemotherapy, radiotherapy and haematopoietic stem cell transplant patients European Journal of Cancer 44: 61-72

Rose-Ped AM, Bellm LA, Epstein JB, Trotti A, Gwede C, Fuchs HJ (2002) Complications of radiation therapy for head and neck cancers. The patient's perspective Cancer Nursing 25: 461-467

Royal College of Surgeons of England/British Society of Disability and Oral Health (2018) The Oral Management of Oncology Patients Requiring Radiotherapy, Chemotherapy and/or Bone Marrow Transplantation.

Sambunjak D, Nickerson JW, Poklepovic T et al (2011) Flossing for the management of periodontal diseases and dental caries in adults. Cochrane Database Syst Rev 12.

Slot DE, Dorfer CE, Van der Weijden GA (2008) The efficacy of interdental brushes on plaque and parameters of periodontal inflammation: a systematic review. International journal of dental hygiene. 6(4):253-64.

Sonis ST, Eilers JP, Epstein JB, et al (1999) Validation of a new scoring system for the assessment of clinical trial research of oral mucositis induced by radiation or chemotherapy. *Mucositis Study Group Cancer* 85: 2103-2113

Sonis ST, Elting LS, Keefe D, et al (2004) Perspectives on cancer therapy-induced mucosal injury: pathogenesis, measurement, epidemiology, and consequences for patients *Cancer* 100: 1995-2025.

Sonis ST (2004) Oral mucositis in cancer therapy *J Support Oncol* 2: 3-8

Treister, N.S., Cook, E.F., Antin, J. et al (2008) Clinical evaluation of oral chronic graft versus host disease. *Biol Blood Marrow Transplant.* 14: 110-115

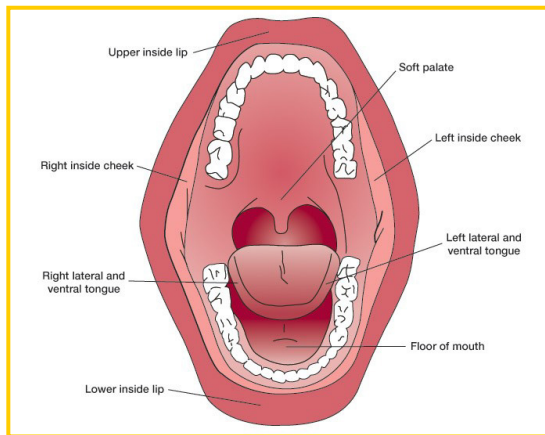
Trotti A, Bellm LA, Epstein JB et al (2003) Mucositis incidence, severity and associated outcomes in patients with head and neck cancer receiving radiotherapy with or without chemotherapy: a systematic literature review *Radiotherapy and Oncology* 66: 253-262

Watson. M. et al (2011) *Palliative Adult Network Guidelines: 3rd edition.* West Sussex

World Health O (1979) *WHO Handbook for Reporting results of cancer treatment.* WHO, Geneva

Appendix 1.0 Quick Reference Guide

Oral sites most susceptible to damage from anti-cancer treatments



Inspecting the oral cavity

- Clinical tools: good light source, gloves, tongue depressor, dry gauze.
- Patient at ease in convenient and comfortable position.
- Use valid and reliable assessment instrument which is easy to interpret.

Examples of clinical assessment instruments

- World Health Organisation recommended with a pain scoring tool (WHO)
- National Cancer Institute grading scale (NCI-CTCAE)
- Oral Assessment Guide (OAG)
- Visual Analogue Scale (VAS)
- Acute Radiation Morbidity Scoring Criteria for the evaluation of Radiotherapy treatments (RTOG)
- Patient-Reported Oral Mucositis Experience Questionnaire
- mIAS scale (for grading mTOR inhibitor-associated stomatitis)
- (WHO 1979, Eilers et al 1988, Mc Cormack et al 1988, Sonis et al 1999, McGuire et al 2002, Boers-Doets 2013, Gussgard et al 2014,)

Some patient risk Factors

- Older patients
- Poor oral/dental health
- Poor nutrition/hydration
- Co-morbidities (e.g. diabetes)
- Inability to perform oral care
- Malignant oral disease
- Prior systemic anti-cancer treatments (SACT)
- Supportive therapies (including BMAs)
- Alcohol/tobacco use

Appendix 2.0 Mouth Care Flow Chart

All treatment strategies aimed at improving mouth care are dependent on four key principles: accurate assessment of the oral cavity; individualized plan of care, initiating timely preventative measures and correct treatment,

Assessment

Assessment should begin prior to treatment, identifying patient risks and treatments most likely to cause oral damage

Mouths should be assessed by trained health care professionals using a recognized grading system

Assessments should be completed at regular intervals before, during and after treatment to monitor interventions, and documented in the medical/nursing records.

Patients should be encouraged to report any changes

Care of the Oral Cavity

Patients should be supported to maintain oral hygiene.

Patients about to commence haematopoietic stem cell transplantation (HSCT) and head and neck radiotherapy, should undergo dental assessment by a dental specialist.

Good nutrition is vital in helping to fight infection and maintain mucosal integrity.

Gentle brushing of teeth, gums and tongue. Single use oral sponges may be used with caution. Patients undergoing treatment for cancer will benefit from using toothpaste with a higher fluoride content.

Dental flossing and/or use of interdental cleaners may reduce plaque formation.

Dentures should be cleaned, dried and stored in a closed container overnight.

Gargling with bland rinses including water or saltwater.

Patients may require information and support about smoking or alcohol cessation.

Support patients to maintain adequate hydration to keep the mouth moist. Lubricants such as Vaseline/white paraffin, lip balm or lip cream may help protect lips.

Prevention of Oral Complications

Risk Classification: Level 1

Encourage self-reporting of any oral changes.

Support and encourage patient to maintain good oral hygiene.

Encourage regular fluid intake.

Nutritional assessment and referral to a dietician where appropriate.

Risk Classification: Level 2

In addition to the preventative interventions for level 1, consider:

Increasing the frequency of gargling with saline/water mouthwashes.

Cryotherapy/sucking ice chips.

Oral rinses - Benzydamine 0.15% (Difflam®) Caphosol®

Mucosal protectants, including Episil®, Gelclair®, Oralife gel® MuGard®

Risk Classification: Level 3

In addition to the preventative interventions for level 1 and 2, consider:

All HSCT patients and head and neck cancer patients should be reviewed by a dietician prior to commencing treatment,

Low level laser therapy (LLLT) NICE 2018)

Anti-infective prophylaxis according to local policies/ guidance.

Daily Vitamin B supplements for patients with alcohol misuse issues

Appendix 3.0 Management of Oral Complications

All treatment plans should be based upon the grading of oral damage.

Mild/Moderate Mucositis/ Oral Complications

- Once oral damage develops patients should be supported to continue oral care.
- Frequency of oral rinsing maybe increased. The aim is to keep the oral surfaces clean and moist.
- Check for oral infections, swab and treat appropriately. Antifungal treatment, local or systemic should be administered if required
- Antifungal mouthwashes can be used in case of super infection with candida
- Dexamethasone containing gels may be used for aphthous lesions
- Consider mucosal protectants (Mugard, Oralife gel, Gelclair, Episil)
- Dietary requirements should be assessed and foods causing discomfort avoided.
- Swallowing problems, malnutrition and weight loss should be monitored and patients given support/advice. Adjustments to food consistency, methods of intake and food fortification should be assessed and support and education offered to patients. Use of supplement drinks, PEG, RIG or Nasogastric feeding should be considered.
- Fluid intake should be assessed and route of administration of pain relief continually monitored. General health problems should also be assessed (swallowing of medication, decreased blood sugar levels and decreased blood pressure, decreased renal function leading to overdosing of substances)
- Patients will need adequate pain medication including topical and systemic analgesia including - paracetamol, codeine, morphine mouthwash, Benzydamine mouthwash, trimecain, topical lignocaine. Patients should be offered education on use and possible side effects including numbness of the oral mucosa.

Treatment of Specific Oral Complications

Managing pain

Consider both topical and systemic approaches to pain management.

May include dispersible paracetamol (as a mouthwash before swallowing). Escalate to soluble co-codamol if required. The use of stronger analgesia, including Oxynorm®, Sevredol® and Oramorph® to alleviate pain may be required. If patients continue to suffer with pain from mucositis, consider using further opioid analgesia and review administration route, such as transdermal patches, patient-controlled analgesia or a syringe driver seek advice from the acute pain team or the palliative care service.

Consider Benzydamine 0.15% oral solution (Difflam®), 10ml rinsed around the mouth and spat out.

Consider increasing Caphosol® frequency up to 10 times a day.

Consider applying a coating protectant, e.g. Episil®, Gelclair®, MuGard® OraLife gel® The product should be rinsed around the mouth to form a protective layer over the sore areas, and generally applied 30-60 minutes before eating.

Topical lignocaine gels such as Instiligel or steroid solution can be used on specific lesions.

Bleeding from OM

If there is associated bleeding in the oral cavity, consider using Tranexamic acid for injection or tablets (these can be added to 5ml water or dissolved). Use as a mouthwash every 4-6 hours to treat localized bleeding. Monitor patients on anti-coagulant therapy or who may be thrombocytopenic.

Xerostomia

Encourage sipping fluids. Viscous solutions e.g. Caphosol® and e.g. Xerotin gels to protect and moisten the mucosa should be considered, patients should be counselled on correct application. In chronic radiotherapy related xerostomia, pilocarpine may be considered.

Trismus

This is a common side effect of surgery or during and after high dose radiotherapy to the head and neck. Patients should be given helpful exercises and the team may consider mechanical devices to help alleviate the problem.

Graft versus Host Disease (GvHD)

Oral graft versus host disease (GvHD) in patients undergoing allogeneic stem cell transplantation may present as lichen planus. Solutions of dexamethasone or other

steroids may be used as first line treatment, second line may include solutions of steroids and other immune suppressant drugs.

Post Treatment Care/ Follow-up

Oral damage in the HSCT, head and neck radiotherapy/chemo-radiation setting will need several weeks/months to heal and patients need continuing support and care during this period.

Chronic side effects of treatment including dental decay, osteoradionecrosis, trismus, fibrosis, lymphoedema, chronic xerostomia and chronic pain require careful management. This will involve the oncology and dental teams working together with the patient to minimise risk, further damage and the careful adjustment and monitoring of any further treatment plans.



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