**Title:** Oral care policy

**Purpose:** For use in the care of patients undergoing head and neck radiotherapy or standard dose chemotherapy. For oral care for patient undergoing high dose chemotherapy please refer to the Standard Operating Procedures of The Christie Haematology and Transplant Unit

**Document Application:** Trust wide

**Responsibilities for implementation:**
Drugs and Therapeutics Committee
Governance and Risk Committee

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**References (if applicable):**
See page 16

**Associated policies/documents:**
See page

**Intranet Category for Location:** Policies and Guidelines/clinical practice

**Key words/phrases:** Oral care; Mouth care; Mucositis

**Approved by:** Clinical and Research Governance Committee

**Date:** October 2010
# Oral Care Protocol

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</table>
1.0 The importance of oral health

Oral health is very important as problems in the mouth can severely affect the patient’s comfort and well-being and may be an indicator of more serious, systemic disease. Some examples of oral signs and symptoms and their significance are given in Appendix 1.

Many factors can contribute to poor oral health and hygiene, including the patient’s general health and lifestyle, socioeconomic status, congenital conditions and illness and its treatment. Some of these factors are listed in Appendix 2 and it is apparent from this list that large numbers of patients will be at risk of oral health problems. Assessment and promotion of oral health must therefore be regarded as the responsibility of all health professionals, although day to day oral care is traditionally the province of nurses. However, there is much evidence within the literature that nurses are at best unsure about oral care and at worst do not regard it as a priority (Clarke, 2009, Wårdh, 2008, Cooley, 2002; Adams, 1996; Barnett, 1991).

In oncology, one of the commonest and most serious oral problems is mucositis. This is a major issue for patients undergoing many anticancer treatments especially those receiving radiotherapy to the head and neck and those having stomatotoxic chemotherapy (standard-and high-dose). Specialist care is required to effectively support patients through what can be a difficult and even life-threatening side effect of treatment. It is essential that all members of the health care team are aware of the optimum management strategies for mucositis.

In 2005, Worthington et al published the results of a Cochrane systematic review examining and advising on the management of oral mucositis. In addition, guidelines from 2004 (Rubenstein et al) and a subsequent update (Keefe et al, 2007) have been published, giving consensus and evidence–based guidance to health professionals for the management of mucositis due to anti-cancer therapy. This protocol has been based on these reviews with the aim of:

- encouraging the promotion of oral health by health care professionals
- ensuring that oral care is performed uniformly across the trust / Cancer Network
- minimising the severity and duration of radiation-induced and standard dose chemotherapy-induced mucositis and its complications
- ensuring that patients’ anti-cancer therapy is not compromised because of mucositis
- minimising malnutrition associated with poor oral health, in particular that due to mucositis

2.0 Oral assessment

An oral assessment should be carried out as part of the admission procedure and should be performed regularly thereafter. Inpatients with, or at risk of, oral health problems should have at least daily oral inspection. Outpatients attending for radiotherapy to the head and neck should be assessed at least once a week and more often if necessary.

The oral assessment should include the following elements:

- Oral care history
  - Attitude to oral hygiene
    - personal oral care routine
    - whether registered with a dentist (at initial assessment only)
    - frequency of visits to the dentist (at initial assessment only)
  - Smoking and alcohol history
  - Dietary intake
    - patient’s normal diet
    - ability to eat solids
    - any difficulty experienced in chewing/swallowing
  - Any other problems the patient experiences relating to the oral cavity such as pain, trismus, excessive or discoloured mucus.
• Inspection of the Oral Cavity
  Personnel
  Inspection of the oral cavity should be carried out by
  o a qualified nurse or doctor
  o an assistant practitioner or health care assistant who has received appropriate
    training and undergone assessment

  Equipment
  o Good light source (a pen torch is ideal)
  o Wooden spatula (tongue depressor)
  o Denture pot (if the patient has full or partial dentures)
  o Gloves
  o Any extra equipment needed to clean the mouth of a dependent or unconscious
    patient

  Examination
  The entire oral cavity should be examined including:
  Lips
  Tongue – dorsal surface
  Floor of mouth and ventral surface of tongue
  Hard palate, soft palate and uvula
  Buccal mucosa (inside of the right and left cheeks)
  Buccal sulcus (between the gums [gingiva] and the cheeks)
  Tonsils / tonsillar fossae
  Posterior pharyngeal wall (back of the throat)
  Gingiva (gums)
  Teeth (remove dentures if present)

  The patient must be asked to remove any dentures to allow a full inspection of all areas of the
  mouth.
  To inspect the back of the mouth, the tongue will normally have to be pressed down gently
  using the wooden spatula. Asking the patient to say “ah” lifts the soft palate, depresses the
  tongue and usually allows a view of the back of the throat.
  The buccal sulci can be inspected using the wooden spatula or gloved fingers to gently pull
  back the lips and cheeks.

  The Healthy Mouth
  Visual assessment
  • The lips should be pink and smooth. The vermillion border should be unbroken.
  • The mucosa should be moist and pink
  • The tongue should be moist and pink with normal appearance of the papillae (taste buds).
    Note: the vallate papillae at the back of the tongue may be very large and prominent.
  • The saliva should be clear, watery and should coat the mucosa without pooling
  • There should be no odour (foetor oris)

  Functional assessment
  • Is speech normal or impaired eg due to pain, dryness or a mechanical problem?
  • Are observed chewing and swallowing impaired eg due to pain, dryness or a mechanical
    problem?
  • What is the dietary intake? If not solids, is there an oral health problem causing the
    alteration of diet?
3.0 General oral care

Patients should be encouraged to take responsibility for their own oral care wherever possible. This may require frequent encouragement and education. The general recommendations of Rubenstein et al (2004) are for:

- initial and ongoing assessment of the oral cavity using both patient reported symptoms and professional examination
- a preventive care regime followed by a therapeutic oral care regime when mucositis develops
- a regular, systematic oral care regime with bland rinses, moisturisers and dental brushing and flossing to be implemented for all patients.
- dental examination and treatment prior to, during and after treatment, especially for those with head and neck cancer
- regular assessment and management of oral pain
- a multidisciplinary approach to oral care

Maintaining a clean and pain-free mouth increases patient comfort and helps to prevent infection and to promote dietary intake. The authors give a useful review of the (predominantly nursing) literature about the implementation and efficacy of oral protocols and patient education. The authors cite evidence suggesting that patients who were taught oral care protocols performed oral care more diligently, took more responsibility for their care and showed an improvement in oral symptoms.

Mouthwashes
- Patients with a healthy mouth may use commercial mouthwashes. Fluoride mouthwashes should be used for dentate patients. Patients with, or at risk of, mucositis should not use commercial mouthwashes because of the alcohol content and astringency.
- Fluoride mouthwashes must be used at a different time to brushing, e.g. after meals
- The tongue can be gently brushed (if not sore) with a soft toothbrush

Dental care
- Dentate patients
  - Teeth should be brushed twice a day with a fluoride toothpaste: in the morning before breakfast and last thing before bed, about 30 minutes after eating or drinking
  - Dental floss should be used once a day (with care in patients with coagulopathies including a low platelet count). Patients with a sore mouth may not be able to do this.
- Edentulous patients
  - Dentures should be soaked overnight in a solution made from proprietary tablets
  - Dentures should be cleaned thoroughly twice daily (before and after soaking overnight) and after every meal using a soft toothbrush and soapy water

Criteria for referral to the dentist
- All patients having radiotherapy to the head and neck (apart from patients with stage 1 and 2 [T1N0 and T2N0] larynx cancer) should have a dental assessment
- Ideally, all dentate patients should see a dentist prior to anti-cancer treatment, particularly those with pre-existing poor oral or dental health

Patients should also be seen by
- a dental hygienist
• an Oral Health Practitioner, where the post exists

- Smoking should be strongly discouraged; patients should be offered help with smoking cessation if necessary in the form of nicotine replacement therapy or referral to smoking cessation services
- A high alcohol intake should be discouraged

4.0 Mucositis

Oral mucositis is a painful and debilitating side effect of some anti-cancer therapies. The majority of patients undergoing head and neck radiotherapy will experience mucositis, and a significant number will have grade 3 or 4 (see page 9). Patients receiving certain chemotherapy agents, such as 5 fluorouracil and methotrexate, are also at risk of mucositis. Sonis (2004) has described the pathophysiology of mucositis as a complex, multistage process. The initial damage resulting from the radiotherapy or chemotherapy sets in train a series of intracellular events. These events culminate in ulceration of the epithelium, which is visible clinically and is responsible for the symptoms of pain and dysphagia. Bacterial colonisation may exacerbate the severity of the mucositis and cause systemic complications.

Mucositis has a major impact on patients, on anti-cancer treatment and on health service resources.

Impact on patients
• Pain, resulting in:
  - increased use of strong opiates (with side effects of constipation, nausea etc)
  - anxiety
  - reduced willingness of the patient to continue with treatment
• Increased production of phlegm, causing:
  - nausea
  - anorexia
  - fluid loss
• Dysphagia, leading to
  - malnutrition
  - weight loss
  - delayed healing
  - dehydration
  - renal impairment
• Risk of oral infection on top of a breached mucosa which may lead to systemic infection (may be life-threatening in immunocompromised patients)

Impact on treatment
• Interruptions to the radiotherapy course (could compromise treatment efficacy)
• Delayed chemotherapy cycles to allow recovery from mucositis
• Chemotherapy dose reduction following an episode of severe mucositis
• Premature cessation of radiotherapy (very rare)

Impact on Health Service resources
• Increased inpatient stay
• Need for enteral/parenteral nutrition
• Drug use: analgesia, laxatives, antimicrobials
There is little available for the prophylaxis of mucositis so its management is mainly concerned with the relief of symptoms and prevention of complications. However, there is evidence that benzydamine (Difflam) may help to prevent mucositis in head and neck radiotherapy and cryotherapy may ameliorate the mucositis associated with 5FU chemotherapy (Keefe et al, 2007). Some new products are licensed for the prevention of mucositis. (see page 10).

Grading of Oral Mucositis

There are several grading systems for oral mucositis. Grading may be based on the appearance of the mucosa or both appearance and function. Nurses and doctors should be familiar with the grading of mucositis and should document the grade as part of their oral assessment.

RTOG (Radiation Therapy Oncology Group)

- Grade 0: no visible mucositis
- Grade 1: erythema (redness) of the mucosa
- Grade 2: patchy fibrin (white pseudomembrane)
- Grade 3: confluent fibrin
- Grade 4: ulceration, necrosis, spontaneous haemorrhage

WHO

- Grade 0: no objective findings. No functional change.
- Grade 1: presence of erythema plus pain; function irrelevant. May include mucosal scalloping with or without erythema.
- Grade 2: presence of ulceration with or without erythema. Patient can swallow solid diet.
- Grade 3: ulceration with or without extensive erythema. Patient is able to swallow liquid but not solid diet
- Grade 4: ulceration, TPN/enteral feeding, alimentation not possible (able to take medication with water only).

Other scales for grading mucositis include the Oral Mucositis Assessment Score (OMAS) (Sonis et al 1999), the National Cancer Institute Common Toxicity Criteria (NCI-CTC) (National Cancer Institute, 1999).

5.0 Standard mouth care for all patients with, or at risk of, mucositis

- All patients should be instructed about mouthcare prior to radiotherapy or chemotherapy
- Head & neck radiotherapy patients should be given a printed sheet with mouthcare advice
- Patients should be educated about the aim of mouthcare
- The information should be frequently reinforced by checking the patient’s mouth care routine and repeating instructions as necessary.
- The routine should begin at or before the start of treatment

Patients with T1 N0 and T2 N0 larynx cancer need not perform this strict mouthcare regime

The following mouthwashes should be started at the beginning of radiotherapy:

<table>
<thead>
<tr>
<th>Mouthwash</th>
<th>Description</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saline</td>
<td>1 level teaspoon table salt in 1 pint tepid water</td>
<td>4 times per day until mouth becomes sore then 2 hourly (approx 3 – 4 mouthfuls swished around and spat out)</td>
</tr>
<tr>
<td>Sodium bicarbonate</td>
<td>1 level teaspoon in 1 pint tepid water</td>
<td>4 times per day until mouth becomes sore then 2 hourly (approx 3 – 4 mouthfuls swished around and spat out)</td>
</tr>
<tr>
<td>(Can be combined with saline)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difflam</td>
<td>10 mls</td>
<td>4 times per day</td>
</tr>
<tr>
<td>Corsodyl should not be used for patients having head and neck radiotherapy or as treatment for mucositis in standard dose chemotherapy</td>
<td></td>
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</tbody>
</table>
Other products which may be helpful include the following. These are not a substitute for the standard mouthcare regime above:

**Gelclair**  Licensed for use in the management and relief of mucositis. Provides a gel barrier over the mucosa and can help with pain relief. Can be used up to 4 times daily. Classed as a medical device.

**Caphosol**  Claimed to be useful in the prevention and management of mucositis. A super-saturated solution of calcium and phosphate, used as a mouthwash. Classed as a medical device.

**Mugard**  Claimed to be useful in the prevention and management of mucositis. Classed as a medical device.

The above mouthcare regime may also be used for patients receiving stomatotoxic standard dose chemotherapy. Patients receiving bolus 5 fluorouracil should be offered cryotherapy in the form of ice chips to suck for 30 minutes prior to treatment.

**Lip care**
Lips in the radiotherapy treatment field can become very sore. The following creams/ointments may be helpful: Unguentum M (paraffin based ointment), yellow or white soft paraffin.
Head and neck patients should be advised not to apply ointments immediately prior to radiotherapy in case the ointment acts as a bolus and increases the dose to the lips.

### 6.0 Recommended analgesia for the management of mucositis

In most patients with mucositis the gut remains intact and functional and all analgesia can normally be given via the enteral route. Most drugs should be given in the liquid or soluble form.

In the totally dysphagic patient or in the presence of severe nausea and vomiting, background pain relief can be provided by a transdermal fentanyl patch.
Analgesia via the SC, IM or IV routes for breakthrough pain should only be used when the patient:
- is totally dysphagic and is awaiting insertion of an enteral feeding tube
- has intractable nausea and vomiting (NB patients with oropharyngeal mucositis may experience retching due to pain or excess phlegm production, both of which may be reduced by use of adequate analgesia)
- has mucositis throughout the gastrointestinal tract
- has intractable pain, uncontrolled by the following measures

<table>
<thead>
<tr>
<th><strong>First line and co-analgesics</strong></th>
<th><strong>Difflam (benzydamine), Gelclair, Caphosol and Mugard may all reduce pain.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aspirin mouthwashes</strong></td>
<td>May be helpful. Dissolve one 300mg tablet in 100ml water and swish the solution round the mouth. Discard the unused portion of the solution. The solution should not be swallowed.</td>
</tr>
<tr>
<td><strong>Paracetamol mucilage</strong></td>
<td>1G/10ml QID, recommended to be taken 20 – 30 minutes before meals and at bedtime. Swished round the mouth and swallowed.</td>
</tr>
<tr>
<td><strong>Non-steroidal anti-inflammatory drugs (NSAIDs)</strong></td>
<td>Do not use if patient is receiving cisplatin, carboplatin or methotrexate chemotherapy  Always use with caution, especially in elderly, in patients with a history of indigestion or if patient also taking steroids. Co-prescribe a proton pump inhibitor or soluble ranitidine.</td>
</tr>
<tr>
<td>Medicine</td>
<td>Dose/Instructions</td>
</tr>
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</tr>
<tr>
<td>Ibuprofen (available as suspension)</td>
<td>200 – 400mg TID prn</td>
</tr>
<tr>
<td>Diclofenac (soluble tablets)</td>
<td>50mg TID</td>
</tr>
<tr>
<td>Sucralfate</td>
<td>No evidence to support its use.</td>
</tr>
</tbody>
</table>

**Second line, weak opiate analgesics (± first line analgesics)**

- **Codeine/paracetamol combinations (+ laxative)**
  - eg. Co-codamol (available as soluble tablets)
  - 8mg codeine/500mg paracetamol – not recommended due to analgesic effect being little more than paracetamol alone, but with constipation
  - 30mg codeine/500mg paracetamol – note large dose of codeine; caution in elderly.

- **Codeine liquid (+ laxative)**
  - (± first line analgesics)
  - 30–60mg QID prn; caution in elderly

**Third line, strong opiate analgesics (± first line analgesics)**

- **Oromorph (+ laxative)**
  - Solution 10mg/5ml 2 – 4 hourly prn
  - Also 20mg/1ml for patients on large doses

- **Morphine sulphate tablets**
  - (Sevredol) (+ laxative)
  - 10mg +, 2 – 4 hourly prn

- **Oxycodone**
  - (Oxynorm) (+ laxative)
  - Tablets or solution (5mg/5ml). Concentrated oral solution 10mg/ml

- **Tramadol**
  - Available in short- or long-acting (24 hour) preparations.
  - Up to 400mg daily.

**Long-acting opioids:**

- **Zomorph capsules**
  - 10, 30, 60, 100 and 200 mg capsules available

- **Oxycontin**
  - 5, 10, 20, 40, 80 mg tablets available

- **Fentanyl transdermal patches**
  - (Durogesic)
  - Starting dose normally 25mcg. Use 12mcg patch only if patient is elderly, has low BMI or is frail. Otherwise use 12mcg patches to increase dose incrementally.

Patients for whom the above measures are not effective in controlling pain should be referred to the Palliative Care Support Team.

### 7.0 Management of oral infections during head and neck radiotherapy

Infection may be bacterial, fungal or viral. Infection on top of mucositis can cause:
- Increased pain
- Increased production of thick, troublesome phlegm
- Systemic infection if there are breaches in the mucosa

**Prophylaxis**

Patients should follow the standard oral care regime for mucositis using saline, sodium bicarbonate and benzydamine (Difflam) mouthwashes.

Excess phlegm production can cause considerable fluid loss so a good fluid intake (2 – 3 litres per day) is essential.

**Recognition and treatment of infection**

The oral cavity should be clean and any saliva/phlegm should be white or clear, even in the presence of mucositis. The presence of discoloured saliva/phlegm suggests infection is present. A swab should be sent for culture and sensitivity but treatment should not be delayed while awaiting results.
**Fungal infection** often presents with one or all of the following:
- White patches or spots
- Bright red patches of mucosa
- Thick, creamy saliva/phlegm
- Sudden increase in pain that is burning in nature

Management:

⇒ Treat with systemic antifungal eg fluconazole
⇒ Nystatin should be used only for mild infections of the anterior oral cavity
⇒ Check patient is performing adequate mouthcare

**Bacterial infection** often presents with one or all of the following:
- Green or yellow saliva/phlegm; may be blood-stained
- Copious amounts of saliva/phlegm (can cause nausea and reduced intake)
- *Foetor oris* (foul smell on the breath)
- Sudden increase in pain
- Patient complains of feeling unwell
- Pyrexia (uncommon in mild infections)

Management:

⇒ Broad spectrum antibiotics eg co-amoxiclav suspension (check allergies)
⇒ Check patient is performing adequate mouthcare
⇒ Consider co-prescribing antifungal
⇒ Advise temporary increase in analgesia if necessary
⇒ Check blood count and biochemical profile if patient at risk of neutropenia

**Viral infection** can present with one or both of the following (is rarely diagnosed during head and neck radiotherapy):
- Circular, punctate lesions
- Pain

Management:

⇒ Antiviral therapy
⇒ Check patient is performing adequate mouthcare

**8.0 Dietary considerations for the patient with mucositis**

As the patient’s mouth or throat become sore, their dietary intake will change and is likely to be reduced. Their appetite may also be impaired due to xerostomia and taste changes. These problems can lead to weight loss, which may be considerable and patients may feel generally unwell, weak and less able to cope with their anticancer therapy. Weight loss is also associated with delayed healing and poorer recovery from radiotherapy (Ravasco et al, 2005).

If drinking is also compromised the patient may become dehydrated, leading potentially to renal failure, especially in patients receiving cisplatin chemotherapy. All patients with mucositis should take in between 2 and 3 litres of fluid per day. If they are unable to drink, fluid must be given via the nasogastric or gastrostomy tube or, in the short term, via an intravenous infusion.

For all patients:
- Weekly weight during head and neck radiotherapy, increasing to twice weekly if there is some weight loss. Weight at each hospital visit for chemotherapy patients
- Strict oral hygiene programme
- Adequate fluid intake (2 – 3 litres per day)
- Adequate analgesia
- Prompt treatment of any oral infections
- Dietary advice – verbal and written
- Prescription of supplement drinks (eg Fortisip, Ensure, Scandishakes)
- Early referral to a dietitian (see criteria below)
- Blood tests (biochemical profile) as indicated
Criteria for referral to a dietitian
- Radiotherapy to the head and neck (Except for T1,2 larynx; parotid tumours)
- Recent, unintentional weight loss of ≥10% of the body weight
- Weight loss despite supplement drinks and adequate analgesia
- Patients with gastrostomy or nasogastric tubes

Patients with painful mucositis who are unable to maintain their weight on oral intake (and who do not already have a gastrostomy/nasogastric tube in situ) should be admitted for insertion of an enteral feeding tube.

9.0 Xerostomia

Xerostomia (dry mouth) can be due to many causes including medication (such as antidepressants, antiepileptics, opiates, amphetamines and antihistamines) Sjögren’s syndrome, diabetes, salivary gland surgery, alcohol, anxiety, dehydration and head and neck radiotherapy.

Xerostomia can be a debilitating condition and can significantly affect patients’ quality of life with an adverse effect on speech, eating, sleeping and comfort. In turn this may cause problems with patients’ work if they have a job that involves talking a lot, such as salesperson or teacher. Xerostomia can predispose to poor dental health as the protective effect of saliva is lost and the result may be severe dental caries or even osteoradionecrosis. Patients are also more prone to infections, particularly fungal, of the oral cavity.

Simple measures may help including frequent sips of water or chewing sugar-free gum. Pineapple chunks and sugar-free pastilles may stimulate saliva flow but they are acidic and should be avoided in dentate patients. There is a variety of artificial saliva products, some of which are listed below. Acupuncture may be helpful for improving salivary flow (Simcock et al, 2009; Johnstone et al, 2002).

Intensity modulated radiotherapy (IMRT) may be used to spare the salivary glands and reduce the late effect of xerostomia.

<table>
<thead>
<tr>
<th>Product</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotene</td>
<td>Range of products: toothpaste, mouthwash, mouth spray, gel, chewing gum</td>
</tr>
<tr>
<td></td>
<td>Both BioXtra and Biotene products contain salivary enzymes and most of them contain fluoride.</td>
</tr>
<tr>
<td>BioXtra</td>
<td>Range of products: toothpaste, mouthwash, mouth spray, gel, gel spray, chewing gum, sucking tablets</td>
</tr>
<tr>
<td>Xerotin</td>
<td>Mouth spray.</td>
</tr>
<tr>
<td>Glandosane</td>
<td>Should not be used in dentate patients as the pH is acidic (5.75) and can hasten the demineralisation of teeth.</td>
</tr>
<tr>
<td>Saliva Orthana</td>
<td>Mouth spray, lozenges. Contains porcine mucin so unacceptable to some cultural groups</td>
</tr>
<tr>
<td>SST tablets</td>
<td>Dissolve in the mouth. Acidic (but manufacturers claim tablet is buffered and will not harm teeth)</td>
</tr>
<tr>
<td>Salivix</td>
<td>Spray. Acidic so may damage teeth.</td>
</tr>
<tr>
<td>Pilocarpine tablets</td>
<td>Effective only where there is some residual salivary gland function. Significant side effects mean many patients do not tolerate this medication. Several contraindications.</td>
</tr>
</tbody>
</table>
10.0 Monitoring effectiveness of the policy

Incidents and complaints relating to oral hygiene will be reported on an annual basis to the head and neck disease group and mortality and morbidity group. If any serious concerns are raised regarding compliance with this policy, this can be escalated to the clinical and research governance committee, which meets monthly.

Patient surveys will be one method used to check compliance with this policy. The results will be reported to the head and neck disease group.

11.0 References


National Cancer Institute Common Toxicity Criteria (1999) Version 2.0, June 1


### APPENDIX 1. Some oral pathology and possible causes

<table>
<thead>
<tr>
<th>Sign / symptom</th>
<th>Cause (examples)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral ulceration</td>
<td>Systemic diseases: Crohn’s disease, ulcerative colitis, coeliac disease, lupus erythematosus, immunodeficiency disorders</td>
</tr>
<tr>
<td></td>
<td>Other causes: trauma from ill-fitting dentures, some drugs (eg antimalarials, methyldopa), aphthous ulcers, oral cancer</td>
</tr>
<tr>
<td>Glossitis (red, smooth, sore tongue)</td>
<td>anaemia, candidiasis, riboflavin and nicotinic acid deficiency</td>
</tr>
<tr>
<td>White patches</td>
<td>lichen planus, leucoplakia, candidiasis</td>
</tr>
<tr>
<td>Black hairy tongue</td>
<td>heavy smoking, use of antiseptic mouthwashes</td>
</tr>
<tr>
<td>Inflammation or swelling of the gingiva (gums)</td>
<td>Inflammation: dental plaque, bacterial infection (acute necrotizing ulcerative gingivitis), mucous membrane pemphigoid Swelling: drug-induced (eg by phenytoin, nifedipine, cyclosporin), leukaemia, pregnancy</td>
</tr>
<tr>
<td>Dental caries and erosion</td>
<td>Caries: poor oral hygiene, poor diet, xerostomia Erosion: acidic food and drinks, bulimia nervosa, oesophageal reflux disease</td>
</tr>
<tr>
<td>Lip lesions, angular stomatitis (cheilitis)</td>
<td>Lip lesions: herpes simplex (cold sore), lip cancer Angular stomatitis: metabolic deficiency, diabetes, lip-licking, immune deficiency</td>
</tr>
</tbody>
</table>
APPENDIX 2. Risk factors for poor oral health

- Poor oral hygiene
- Ill health
- Mouth breathing
- Systemic disease
- Dehydration
- Malnutrition
- Metabolic conditions (eg diabetes, thyroid dysfunction)
- Infection
- Smoking
- High alcohol intake
- Immobility
- Some physical disabilities
- Lower socioeconomic status
- Learning disabilities
- Mental health problems
- Head and neck cancer
- Trismus
- Radiotherapy to the head and neck
- Chemotherapy
- Immune deficiency
- Xerostomia
- Medications (including steroids, opiates, antibiotics, antidepressants)
- Oxygen therapy
- Trauma – broken teeth, ill fitting dentures