

# Guideline for Management of Oral Potentially Malignant Disorders



National Cancer Control Programme  
Ministry of Health, Nutrition and  
Indigenous Medicine  
Sri Lanka



# **National Guideline for Management of Oral Potentially Malignant Disorders**

**A Guide for  
Dental and Medical Practitioners**

National Cancer Control Programme  
Ministry of Health, Nutrition and Indigenous Medicine  
Sri Lanka

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## **Message from Director General of Health Services Ministry of Health, Nutrition and Indigenous Medicine**

Cancer is a leading cause of death globally and more than 70% of all cancer deaths occur in low and middle income countries, where resources available for prevention, diagnosis and treatment of cancer are limited. The Government of Sri Lanka has been able to provide free health care of high quality in comparison to most of the other countries of the region, even with limited resources.

Cancer is one of the major non communicable diseases, which is on the rise. Out of all cancers, oral cancer plays a significant role in Sri Lanka. Oral cancer is preventable and could be detected early which leads to reduce both mortality and morbidity. Therefore, development of guideline for management of Oral Potentially Malignant Disorder is important to improve the quality of care provided in the health institutions. It will ensure the efficiency, cost effectiveness and uniformity of the care provided in the government hospitals.

I hope health care providers would make the maximum use of this effort and provide care of highest standard.

**Dr. Palitha Mahipala**  
Director General of Health Services

**Preface**  
**Director,**  
**National Cancer Control Programme**

It gives me great pleasure to send this message on the occasion of reprinting the Guideline for Oral Potentially Malignant Disorders.

Lip, oral cavity and pharyngeal cancers are the leading cancers identified among males in Sri Lanka and account for approximately one fifth of all male cancers. These cancers are predominantly preventable through modification of life style and habits. Most of the oral cancers go through a potentially malignant period before becoming malignant. If these lesions or conditions which are collectively named Oral Potentially Malignant Disorders get detected, transformation into a malignancy could be averted.

The need of a guideline for healthcare providers on screening, diagnosis and management of these disorders including the criteria for referral for specialist care has been correctly identified by the National Cancer Control Programme. This guideline was produced to fulfil those requirements.

I wish to place on record my sincere appreciation to Dr. Hemantha Amarasingha, former Consultant in Community Dentistry, National Cancer Control Programme who took a lead role in the development of this guideline and the members of the expert panel and Dr. Neelamani Paranagama, former Director of the National Cancer Control Programme for providing guidance.

I wish to thank Dr. Prasanna Jayasekera, Consultant in Community Dentistry and his team for taking the initiative for reprinting of this important guideline.

**Dr. Eshani Fernando**

Acting Director, National Cancer Control Programme



# 1. Introduction

## 1.1 Background

Oral cancer is the commonest malignancy among males in Sri Lanka and the sixth most common cancer among females. It is estimated to account for 13.6% of all cancers occurring among the Sri Lankan population. According to the latest available statistics (2009) the age standardized incidence of oral and oropharyngeal cancer among Sri Lankans is reported as 19.4 and 5.2 per 100,000 among males and females respectively (National Cancer Control Programme Sri Lanka 2015).

More than 90% of oral cancers are squamous cell carcinoma (SCC) (Moore et al. 2000). In most instances oral SCC is preceded by clinically recognizable disorders appearing on the oral mucosa such as leukoplakia, erythroplakia, oral submucous fibrosis and oral lichen planus. These disorders are collectively referred to as Oral Potentially Malignant Disorders (OPMDs) (Warnakulasuriya et al. 2007). These main OPMDs, except, oral lichen planus, are usually associated with the habits such as betel chewing, smoking, snuff dipping, areca nut chewing and alcohol intake (Shiu and Chen 2004; Tilakaratne et al. 2006). Smoking and alcohol consumption have been shown to act synergistically with the combined risk being considerably increased in comparison to when the individual factor is found alone (Blot et al. 1988). All OPMDs do not necessarily undergo malignant transformation.

According to the National Oral Health Survey of Sri Lanka 2002/2003, leukoplakia and erythroplakia in combination were the most prevalent OPMDs among 35-44 and 65-

74 year old age groups (prevalence of these OPMDs in combination was 1.57% and 3.68 in the respective age groups). The same study had revealed that prevalence of oral cancer among 65-74 year old age group was 0.25% (Ministry of Health Sri Lanka 2009). A study done in Kadugannawa in the Central Province of Sri Lanka reported that the prevalence of OPMD among the general population aged over 20 years was 1.15% and it was 6.7% among tea estate workers (Warnakulasuriya et al. 1984; Ariyawardana et al. 2007). Another study conducted in Sabaragamuwa province revealed that the prevalence of OPMD among those in the rural and estate sector was 11% (Amarasinghe et al. 2010).

As most of the risk factors stated above are related to life style of individuals, it is evident that most oral cancers are preventable. Moreover, oral cavity can be easily examined without the need of any sophisticated equipment. Primary and secondary prevention of oral cancers are thus relatively easily attainable if health care providers such as dental surgeons and medical officers have adequate knowledge on risk factors and skills in the recognition of OPMDs and whenever opportunity arises, perform a thorough examination of the mouths of their patients to detect OPMDs. Such routine examination of the mouth would also facilitate the detection of oral cancer in its early stages, which would in turn lead to prompt referral of the patients for relatively less complicated and less mutilating treatment.

This guideline consists of three sections.

1. Screening
2. Management of OPMD
3. Surveillance

## 2. Screening Guidelines

### 2.1. Introduction

Screening is:

'The systematic application of a test or inquiry, to identify individuals at sufficient risk of a specific disorder to warrant further investigation or direct preventive action, amongst persons who have not sought medical attention on account of symptoms of that disorder' (United Kingdom National Screening Committee 1998).

The purpose of screening is:

To identify individuals at higher risk of a disease or condition in order to diagnose and treat at an early stage, and therefore reduce morbidity and mortality.

### Concept of screening

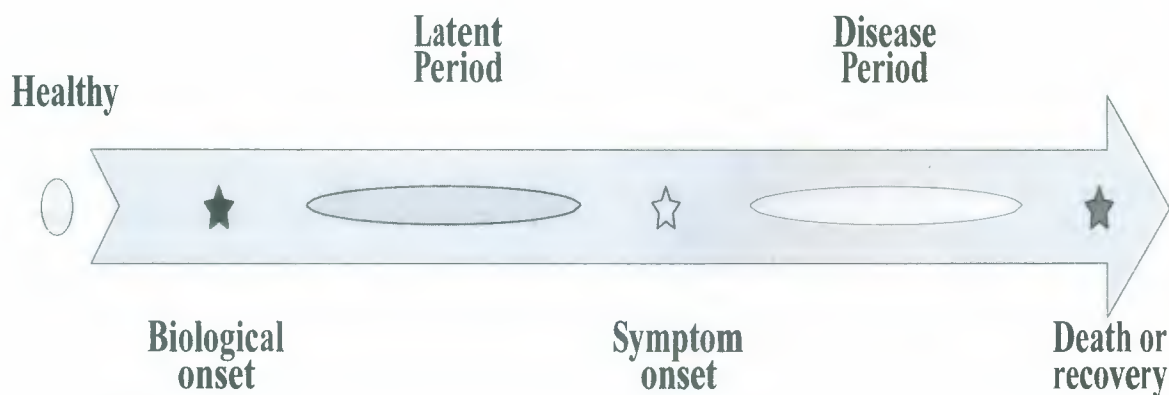
In order to understand the screening process, it is necessary to consider the different stages in the development of a disease.

- \* The time at which a disease or condition first appears, but yet to cause any symptoms.

*E.g.:* In the case of oral cancer this would be the development of the first cancerous cell.

- \* The period of time between the biological onset of disease and the development of symptoms.

*E.g.:* In the case of oral cancer, this would be the duration between the development of the first cancerous cell and the time at which an oral lesion is seen.



National History of disease

## Screening should be done during the latent period of the disease

The core assumption in oral cancer screening,

- Diagnosis and treatment in the latent period will lead to better outcomes than diagnosis and treatment following the presentation of symptoms.

Oral cancer is a disease which fulfils all the criteria for screening. It is considered to be one of the most cost effective approaches for control of oral cancer.

## 2.2 Types of screening

There are two types of screening.

- Risk strategy
  - Directed or targeted approach for population sub groups who are at risk
  - Could be done by primary health care workers.
- Opportunistic screening in dental/ medical clinics

Although above screening strategies are implemented in Sri Lanka, there are problems in identifying the target groups, coverage and sustainability of these programmes. These reasons may contribute towards increased number of patients presenting to hospitals with advanced stages of oral cancer which are often at the incurable stage.

The main obstacles for effective OPMD/oral cancer screening in Sri Lanka are:

- Lack of proper referral system
- Difficulty in allocating time for oral cancer screening due to routine activities of PHC staff such

as MCH (Maternal and Child Health) and devolution of all vertical preventive programmes to the grassroots level

- Inadequate continuous education programmes for primary health care workers and dental surgeons to update the knowledge
- Lack of monitoring and evaluation of health care workers.
- Lack of comprehensive surveillance system for OPMD / oral cancer.

As a possible solution to these problems, a risk factor model (RFM) has been developed to identify individuals who are at high risk for oral cancer and for OPMD and target for oral examination and prevention (Amarasinghe et al. 2010). This approach is consonant with the Crete Declaration on Oral Cancer Prevention. In the RFM, a risk score is calculated according to the age, habits such as chewing betel-quid, alcohol consumption, and tobacco smoking and the socioeconomic status of the individual. These scores were derived from the Odds Ratios (Odds of being exposed to the risk factors among the persons with disease compared to odds of being exposed to the risk factors among the healthy population) obtained in an epidemiological research study. A risk score of 12 is considered as the cutoff value to achieve a sensitivity of 93.7% and a specificity of 67.7%. At this level, the positive predictive value of the test is 27.5% with a false positive rate of 32.3%.

The suggested strategy for screening for OPMD and referral is to refer all those people who score more than the cut-off value of 12, for an intra oral examination by a trained professional (dental surgeon).

**Table1: Risk Factor Model**

| <i>Characteristics</i>  | <i>Risk Score</i> |
|---|-------------------|
| <b>Age (years)</b>  |                   |
| 15 – 30   | 0                 |
| > 30  | 3                 |
| <b>Socioeconomic status</b>                                       |                   |
| High  | 0                 |
| Middle / Low  | 3                 |
| <b>Betel-quid chewing (number of times chewing betel per day)</b> |                   |
| Never   | 0                 |
| 0-3 times per day   | 2.5               |
| More than 3 times a day   | 16                |
| <b>Alcohol Drinking</b>   |                   |
| Never   | 0                 |
| Past / occasional   | 1                 |
| Daily / weekly  | 3                 |
| <b>Smoking</b>  |                   |
| Never   | 0                 |
| Ever  | 1                 |

### **2.3 Role of health care facilities and service providers**

- Developing strategies to strengthen the health seeking behaviours of individuals

#### **2.3.1 Role of the National Cancer Control Programme**

- Capacity building of PHC staff
- Capacity building of dental surgeons and medical officers
- Maintaining Cancer surveillance
- Developing tools to increase the awareness of general public on OPMD and oral cancer

- Monitoring and evaluation of oral cancer prevention and early detection programme
- Advocacy to the government and non-government organizations on prevention and control of oral cancer

### **2.3.2 Role of District Health Managers**

- Implementing the programme at district level
- Co-ordinating training programmes for dental surgeons and PHC staff
- Organizing targeted awareness campaigns at district level
- Conducting outreach programmes for screening of high risk individuals
- Maintaining the cancer surveillance at district level
- Monitoring and evaluation of the programme at district level

### **2.3.3 Role of PHC Staff**

- Identifying high risk individuals according to the risk factor model and refer them to dental clinics
- Educating the public on the importance of self-oral examination
- Carrying out a brief oral examination where necessary to identify suspicious lesions
- Tracing the loss to follow up patients diagnosed with oral cancer/OPMD
- Acting as a counselor and palliative care provider

### **2.3.4 Role of Hospital Dental Surgeon**

- Opportunistic screening of patients attending the dental clinic for OPMD/ Oral Cancer
- Priority given for screening for persons referred by PHC staff and self-referred patients
- Giving instructions to persons referred by PHC staff and self-referred patients to improve the oral hygiene and habit intervention
- Managing patients with OPMD at clinic level or referring them according to the OPMD guideline to the Oral and Maxillo Facial (OMF) Clinic for further management
- The patients with oral cancer should be referred to the OMF Clinic for further management
- In case of back referral, follow-up and oral hygiene improvement should be done according to the treatment plan
- In patients with OPMD, stabilization of the mouth is considered as the most important step in preventing malignant transformation. Therefore, the dental surgeons of the primary care institutions should take maximum effort to stabilize the mouth before referring patient with OPMD to OMF clinic
- Maintaining the "Register for new patients with oral cancer and Oral Potentially Malignant Disorders" at the clinic and sending Monthly statistics to central level through the Monthly Report of Hospital Dental Clinics (format H1201)

### 2.3.5 Role of Medical Officers

- Identifying high risk individuals according to the Risk Factor Model and carry out intra oral examination at the OPD.
- If any abnormality is identified, refer the patient to a dental surgeon for further management

### 2.3.6 Role of OMF Units

- Managing patients with OPMD according to the guideline.
- Back referral of the patients to the relevant dental clinics for oral hygiene improvement and follow-up. Accountability for patients is expected to be improved by this method.
- Maintaining the “Register for new patients with oral cancer and Oral Potentially Malignant Disorders” at the OMF clinic. Annual returns should be sent to the National Cancer Control Programme Narahenpita, Colombo 5, according to the General Circular No: 01-33/2012.

## 2.4 Oral mucosal abnormalities which can be identified through an oral examination

### Frictional keratosis

A whitish or grayish patch, which corresponds to the site of a recognizable physical trauma.

### Denture stomatitis

Denture stomatitis is described as an inflammation of oral mucosa in people wearing dentures due to constant wearing and poor oral hygiene. Other contributory factors could be dry mouth and immuno suppression. Causative agent for Denture stomatitis is candidiasis.

### Stomatitis nicotina palati

A specific white lesion of the palate in pipe & cigar smokers

At initial stage the palatal mucosa shows erythematous changes followed by keratinization. Subsequently red dots surrounded by white keratotic rings appear.

The red dots represent the inflamed ducts of the minor salivary glands.

### Angularcheilitis

Angularcheilitis often represents an opportunistic infection of fungi and/or bacteria with multiple local and systemic predisposing factors such as over closure of the mouth, nutritional deficiencies, dry mouth, immuno suppression, drooling and wearing of poorly fitted dentures.

### Aphthous ulcers

Minor aphthous ulcer is a small painful ulcer in the mouth, approximately 2 to 5mm in diameter. It usually heals within two weeks with no scarring. Major aphthous ulcers, which are large painful ulcers (more than 10mm) that take weeks or months to heal and do so with scarring.

### **Leukoedema**

Leukoedema appears as a white opalescence of the buccal mucosa that disappears when the mucosa is stretched and reappears upon relaxation. This is a normal anatomical variation, which is more common among people with dark skin and especially among smokers (*Fig. 1*).

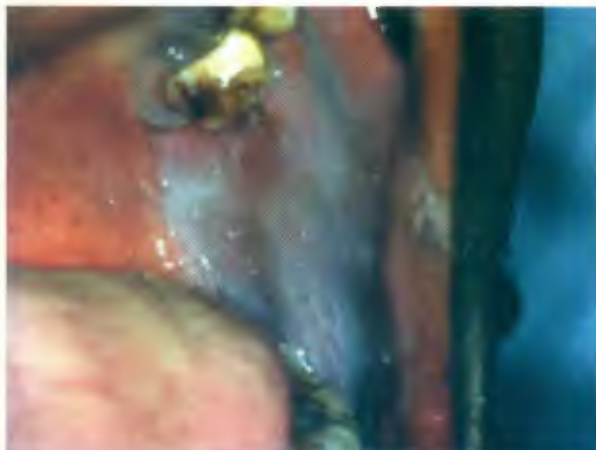
### **Chewer's mucosa**

Yellowish or reddish brown wrinkled incrustation on the oral mucosa that can be scraped off, leaving behind non-elevated mucosal alterations such as a whitish area due to direct action of the quid or traumatic effect of chewing (*Fig. 2*).

### **Quid induced lichenoid lesion**

It resembles oral lichen planus. This condition is characterised by the presence of fine, white, wavy, parallel non-elevated lines that do not overlap or criss-cross, and some instances these lines radiate from a central erythematous areas. These should be reviewed annually (*Fig. 3*).

***Fig. 1: Leukoedema on the left buccal mucosa***



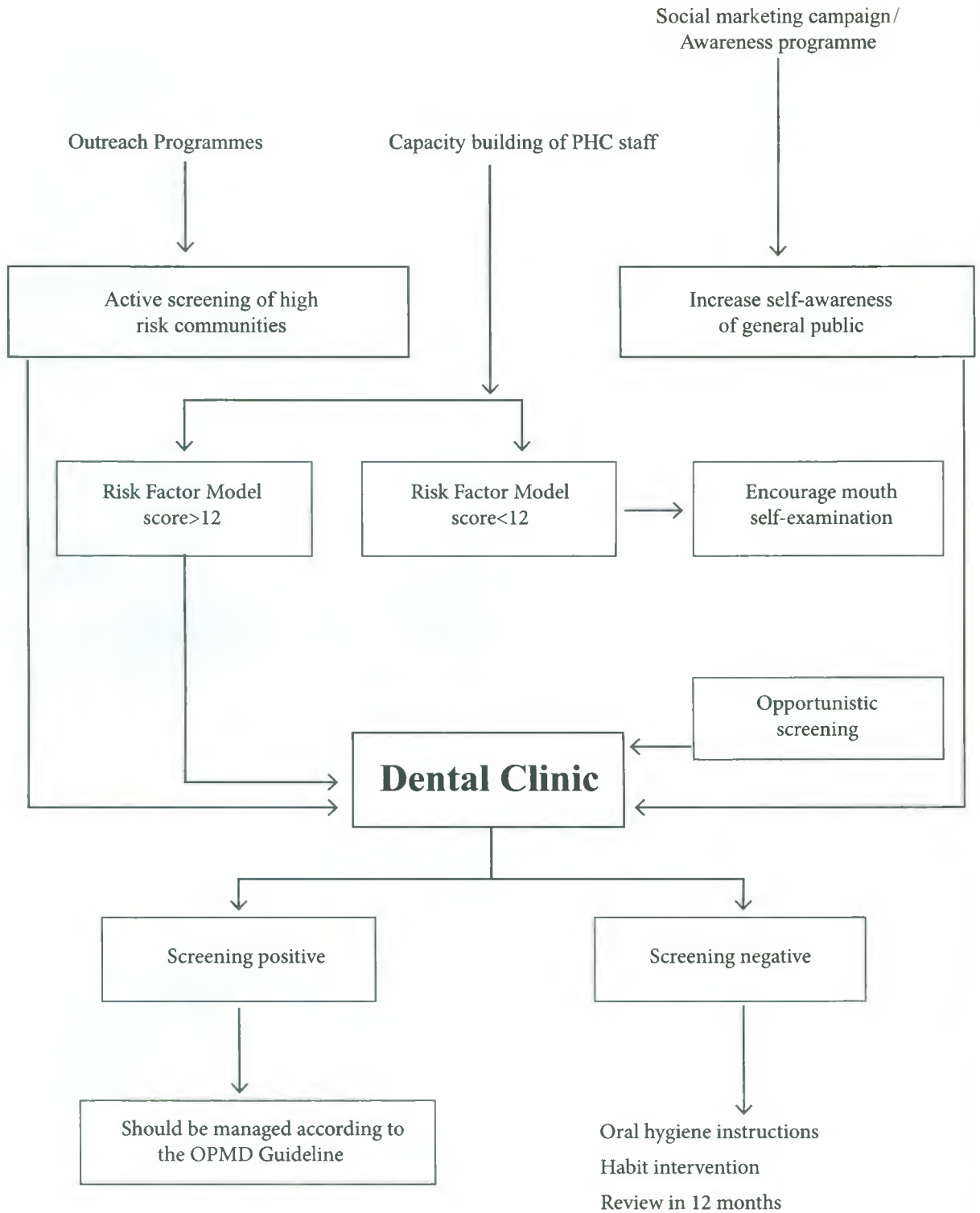
***Fig. 2: Chewer's mucosa***



***Fig. 3: Quid induced lichenoid lesion***



**Fig. 4: Screening and Referral Pathway**





### 3. Diagnosis and management of OPMD

This guideline is intended to provide evidence based management which include diagnostic information on OPMDs for:

- A. Dental surgeons at primary care dental clinics located at state and non- state institutions and practices.
- B. Oral and maxillofacial surgeons in secondary and tertiary care hospitals.

This guideline envisage that both categories of the staff which stated above would be inter-dependent in the management of OPMD.

Although the primary target audience is the staff categories listed above, other health professionals also would find it useful.

#### Oral Potentially Malignant Disorders

Table 2 shows the disorders that are considered as OPMDs (Warnakulasuriya, et al. 2007; Amagasa et al. 2011). However only four most important disorders (leukoplakia, erythroplakia, oral submucous fibrosis and oral lichen planus) are described in this guideline.

Table 2: Oral Potential malignant disorders

|  |
|--|
| Leukoplakia                            |
| Erythroplakia                          |
| Oral submucous fibrosis                |
| Oral lichen planus                     |
| Palatal changes due to reverse smoking |
| Discoid lupus erythematosus            |
| Actinic keratosis                      |
| Inherited disorders                    |
| Dyskeratosis congenita                 |
| Epidermolysis bullosa                  |
| Xeroderma pigmentosum                  |
| Fanconi's anaemia                      |

#### 3.1 Leukoplakia

Leukoplakia is generally defined as a predominantly white lesion of the oral mucosa that cannot be clinically or histopathologically characterized as any other definable lesion (Pindborg 1997; Batsakis et al. 1999; Warnakulasuriya et al. 2007; Feller and Lemmer 2012). Leukoplakia is the most common potentially malignant lesion of the oral mucosa (Feller and Lemmer, 2012). The term leukoplakia is a clinical descriptor only (Bouquot 2006). (The terms keratosis and dyskeratosis are histological features and should not be used as clinical terms). On the basis of the following clinical features a provisional diagnosis of leukoplakia is made when the lesion cannot be clearly diagnosed as any other disease of the oral mucosa with a white appearance.

#### Clinical features

Leukoplakia can be either solitary or multiple. It may appear on any site of the oral cavity.

But the most common sites for leukoplakia are buccal mucosa, alveolar mucosa floor of the mouth, tongue, lips and palate (Reibel 2009).

Generally two clinical types of leukoplakia are recognized: homogeneous and non-homogeneous, which can be co-existed (Warnakulasuriya et al. 2007).

- Homogeneous leukoplakia is defined as a predominantly white lesion of uniform flat and thin appearance that may exhibit shallow cracks and that has a smooth, wrinkled or corrugated surface with a consistent texture throughout (Warnakulasuriya et al. 2007). This type is usually asymptomatic.
- Non-homogeneous leukoplakia has been defined as a predominantly white and red lesion (“erythroleukoplakia”) (Isaac Vander Waal 2009). This may be
  - Ulcerated leukoplakia
  - Nodular leukoplakia
  - Verrucous leukoplakia

These types of leukoplakia are often associated with mild complaints of localised pain or discomfort.

Proliferative verrucous leukoplakia is an aggressive type of verrucous leukoplakia that almost invariably develops into malignancy (Feller and Lemmer, 2012; Batsakis et al. 1999). This type is characterized by widespread and multifocal appearance, often in patients without known risk factors (Batsakis et al. 1999, Vander Waal 2009).

In general, non-homogeneous leukoplakia has a higher malignant transformation risk, but oral carcinoma may develop from any leukoplakia (Batsakis et al. 1999).

## Diagnosis

Clinical diagnosis of Leukoplakia has the following approaches (Vander Waal 2009) (Fig. 5).

**Provisional clinical diagnosis:** It is based on clinical features stated above on a single visit, using inspection and palpation as the only diagnostic means (van der Waal 2009).

**Definitive clinical diagnosis:** It is based on clinical evidence obtained by lack of changes after identifying and eliminating suspected aetiologic factors during a follow-up period of 2-4 weeks (In some cases the time may be longer) (van der Waal 2009).

**Histopathologically proven diagnosis:** Definitive clinical diagnosis complemented by biopsy in which, histopathologically, no other definable lesion is observed.

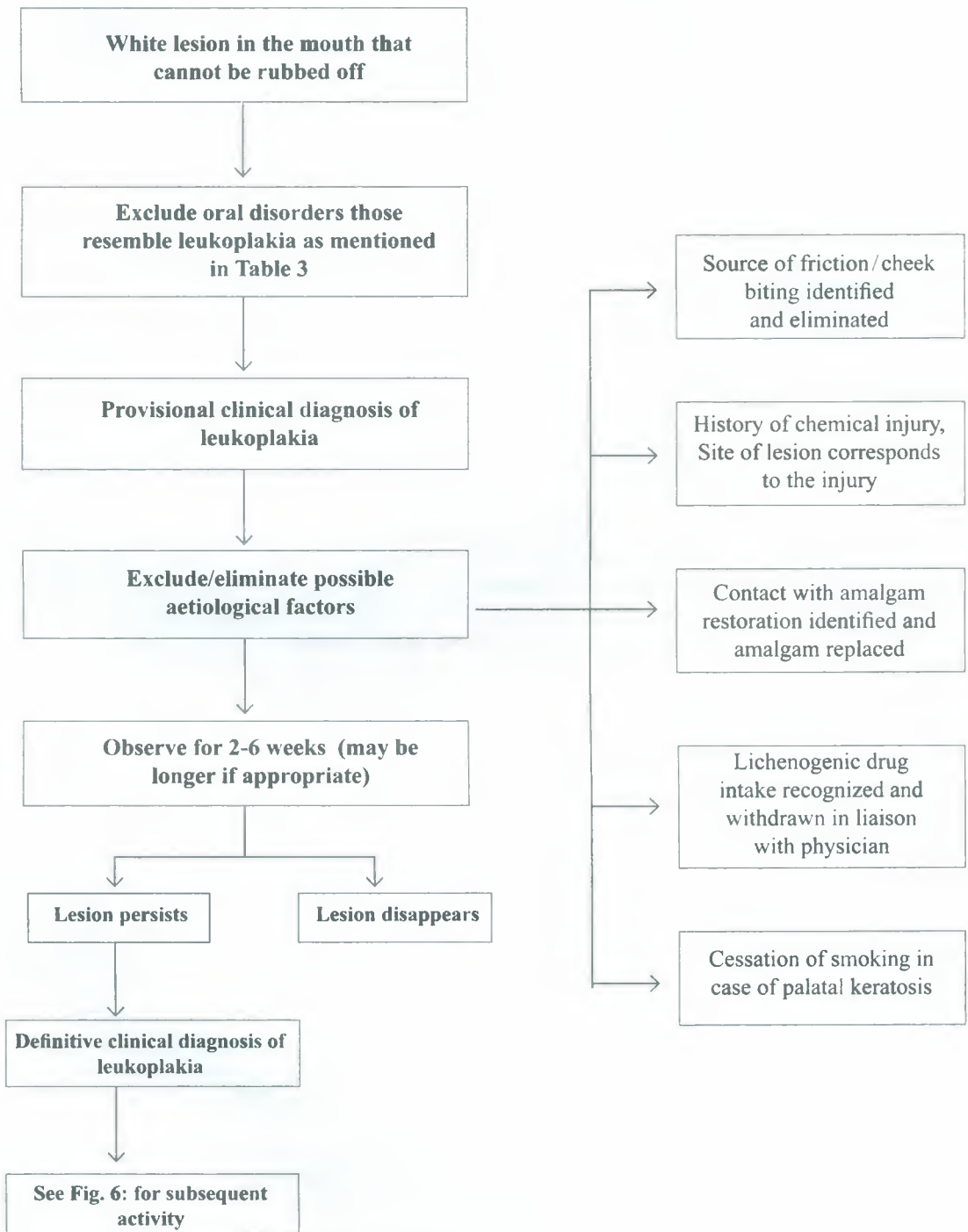
Table 3 shows differential diagnosis of oral disorders that resembles oral leukoplakia.

**Table 3: Oral disorders that resemble leukoplakia and need to be excluded (adapted from Warnakulasuriya et al 2007) See in conjunction with Fig. 5**

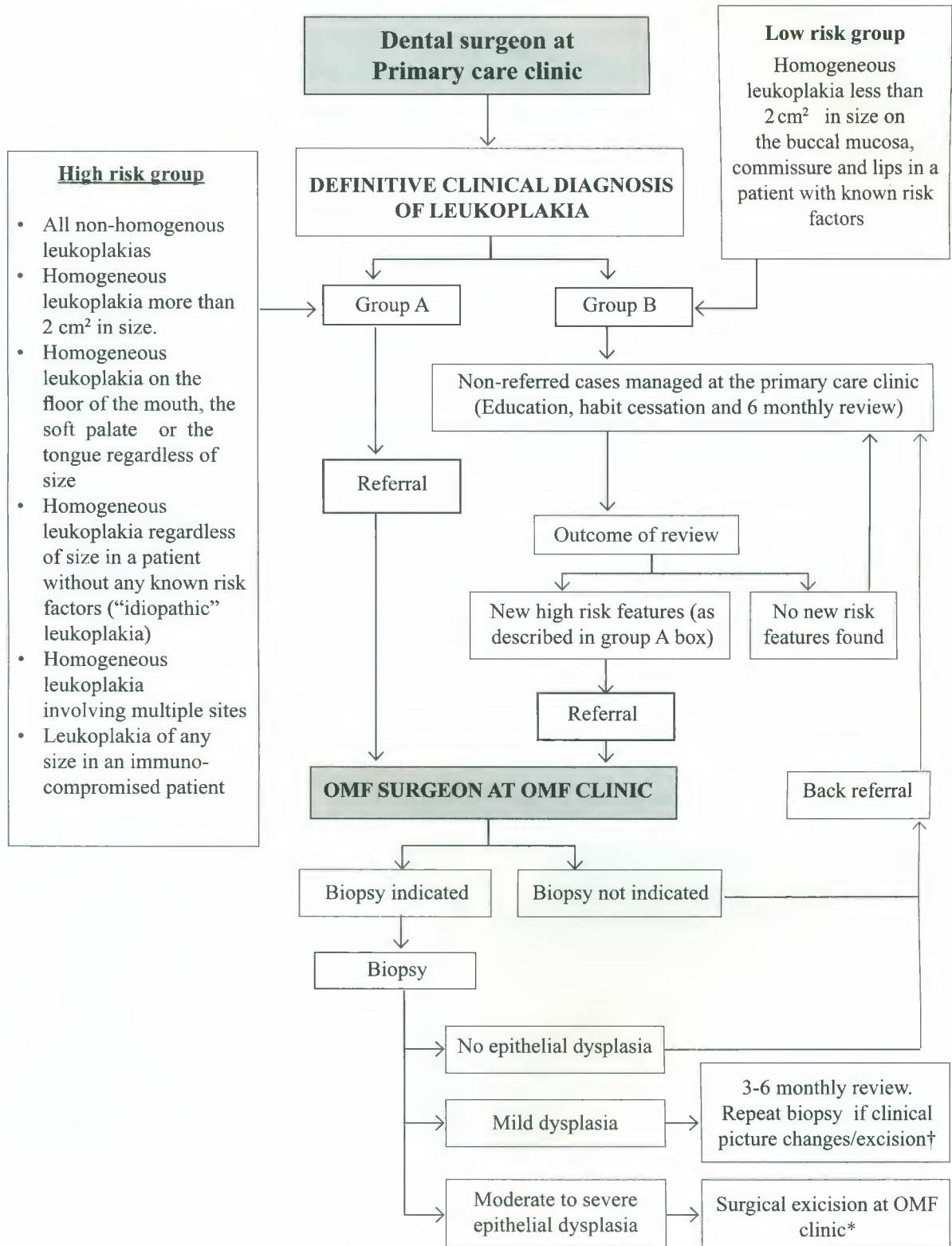
| Disorder   | Diagnostic features  | Biopsy/Other investigations   |
|--|--|---|
| Lichen planus (plaque type)                      | Other forms of lichen planus (reticular) found in association  | Biopsy consistent with lichen planus  |
| Lichenoid reaction                               | Drug history, e.g. close to an amalgam restoration   | Biopsy consistent with lichen planus or lichenoid reaction                          |
| Discoid lupus erythematosus (DLE)                | Circumscribed lesion with central erythema with radiating white lines  | Biopsy consistent with DLE supported by immunofluorescence and other investigations |
| Leukoedema                                       | Bilateral on buccal mucosa, could be made to disappear on stretching (retracting), racial                                  | Not indicated   |
| Acute pseudomembranous candidiasis               | The membrane can be scraped off leaving an erythematous raw surface  | Swab for culture  |
| White sponge nevus                               | Noted in early life, family history, large areas involved, genital mucosa may be affected                                  | Biopsy not indicated  |
| Frictional keratosis                             | History of trauma, mostly along the occlusal plane, an etiological cause apparent, mostly reversible on removing the cause | Biopsy if persistent after elimination of cause particularly in a tobacco user      |
| Chronic cheek biting                             | Habitual cheek – lip biting known, irregular whitish flakes with jagged outline  | Biopsy not indicated  |
| Leukokeratosis nicotina palate (smoker's palate) | Smoking history, greyish white palate  | Not indicated   |
| Chemical injury                                  | Known history, site of lesion corresponds to chemical injury, painful, resolves rapidly                                    | Not indicated   |
| Skin graft                                       | Known history  | Not indicated   |
| Hairy leukoplakia                                | Bilateral tongue keratosis. Specific histopathology with koilocytosis  | EBV demonstrable on in situ hybridization   |

See Figure 5 and Fig 6 for flow charts for the diagnosis and management of leukoplakia

**Fig. 5: Flow chart for the clinical diagnosis of leukoplakia**



**Fig. 6: Flow chart for the management of leukoplakia**



†-Taking into consideration patient factors such as medical/social etc.

\*-No treatment method including surgical excision is shown to prevent development of SCC (Holmstrup et al. 2006)

**Fig. 7: Homogeneous leukoplakia on the left buccal mucosa with central fissuring and pigmented areas**

common in beedi smokers; [note the mucocoele (arrow) at the commissure].



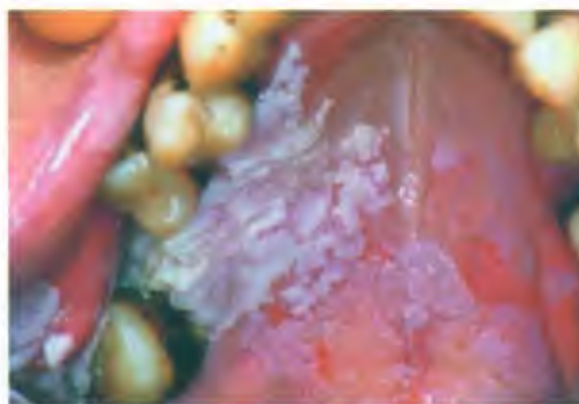
**Fig. 8: Nodular leukoplakia on the right buccal mucosa.**

A well-circumscribed lesion of 3 x 1 cm size on the right buccal mucosa in a 63 year-old habitual betel quid chewing female. Note the pin head sized nodules scattered on an erythematous base.



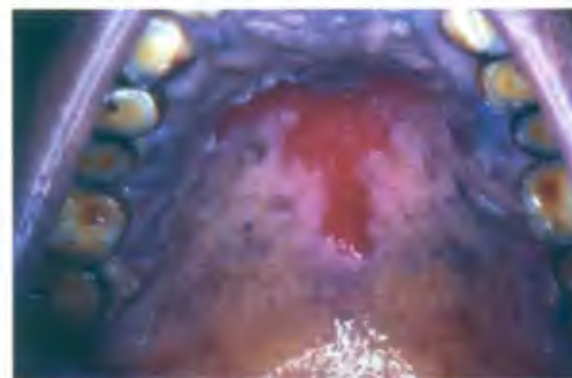
**Fig. 9: Proliferative verrucous leukoplakia (PVL).**

Note the extensive, thick, white plaques



**Fig. 10: Palatal lesion associated with reverse smoking.**

Note the well-defined redness of the palatal mucosa.



## 3.2 Erythroplakia

Oral erythroplakia (OE) is considered as a rare potentially malignant disease of the oral mucosa and is classically defined as “fiery red patch of the oral mucosa that cannot be characterized clinically or pathologically as any other definable disease” (Pindborg, et al. 1997). It must be noted that in case of a mixture of red and white changes, such lesion is usually categorized as non-homogeneous leukoplakia (“erythroleukoplakia”). The natural history of OE is unknown. It is not clear whether OEs develop de novo or they develop from oral leukoplakia through several intermediate stages of white/red lesions (Pindborg, et al. 1997).

### **Aetiology:**

The etiology of OE reveals a strong association with tobacco consumption and the use of alcohol (Pindborg, et al. 1997). The possible role of *Candida albicans* is still unclear.

### **Epidemiology:**

Studies performed in South and South-east Asia revealed that the prevalence of OE varies between 0.02% and 0.83% (Reichart and Philipsen 2005). OE is predominantly seen in middle aged and elderly (Scully 2004). There is no distinct gender preponderance.

### **Clinical features:**

Lesions of OE are usually less than 1.5 cm in diameter but lesions larger than 4 cm in diameter also have been reported (Bouquet

and Ephros 1995). The clinical appearance may be flat with a smooth or granular surface (Reichart and Philipsen 2005). The surface of OE is often depressed below the level of the surrounding mucosa (Cawson 1996). Any site of the oral and oropharyngeal cavity may be involved, usually in a solitary fashion. Soft palate, floor of the mouth and buccal mucosa are most commonly affected by OE (Shafer and Waldron 1975). The tongue is rarely affected (Pindborg 1997). This solitary presentation is often helpful in clinically distinguishing erythroplakia from several other erythematous lesions affecting the oral mucosa, since these lesions occur almost always in a bilateral, more or less symmetrical pattern (van der Waal 2010). (See Table 4 for differential diagnosis of OE). OE is soft to palpation and does not become indurated or hard until transform into an invasive carcinoma.

OE is diagnosed by exclusion. The term OE does not carry a histopathologic connotation. As for Oral leukoplakia the principle of provisional diagnosis and definitive diagnosis is also suggested for OE. A provisional diagnosis of OE is made when a lesion at clinical examination cannot be clearly diagnosed as any other disease of the oral mucosa with red appearance. A definitive diagnosis of OE is made as a result of identification, and if possible elimination, of suspected aetiological factors and, in case of persistent lesions, histopathological examination. OE is seldom multicentric and rarely covers extensive areas of the mouth (van der Waal 2010).

Histopathologically, erythroplakia commonly shows some degree of dysplasia and often carcinoma in-situ or even invasive carcinoma.

It has been documented that 51% of OE showed invasive carcinoma, 40% carcinoma in situ and 9% mild or moderate dysplasia. Transformation rates of OE are considered to be the highest among all OPMDs.

### **Prognosis and treatment**

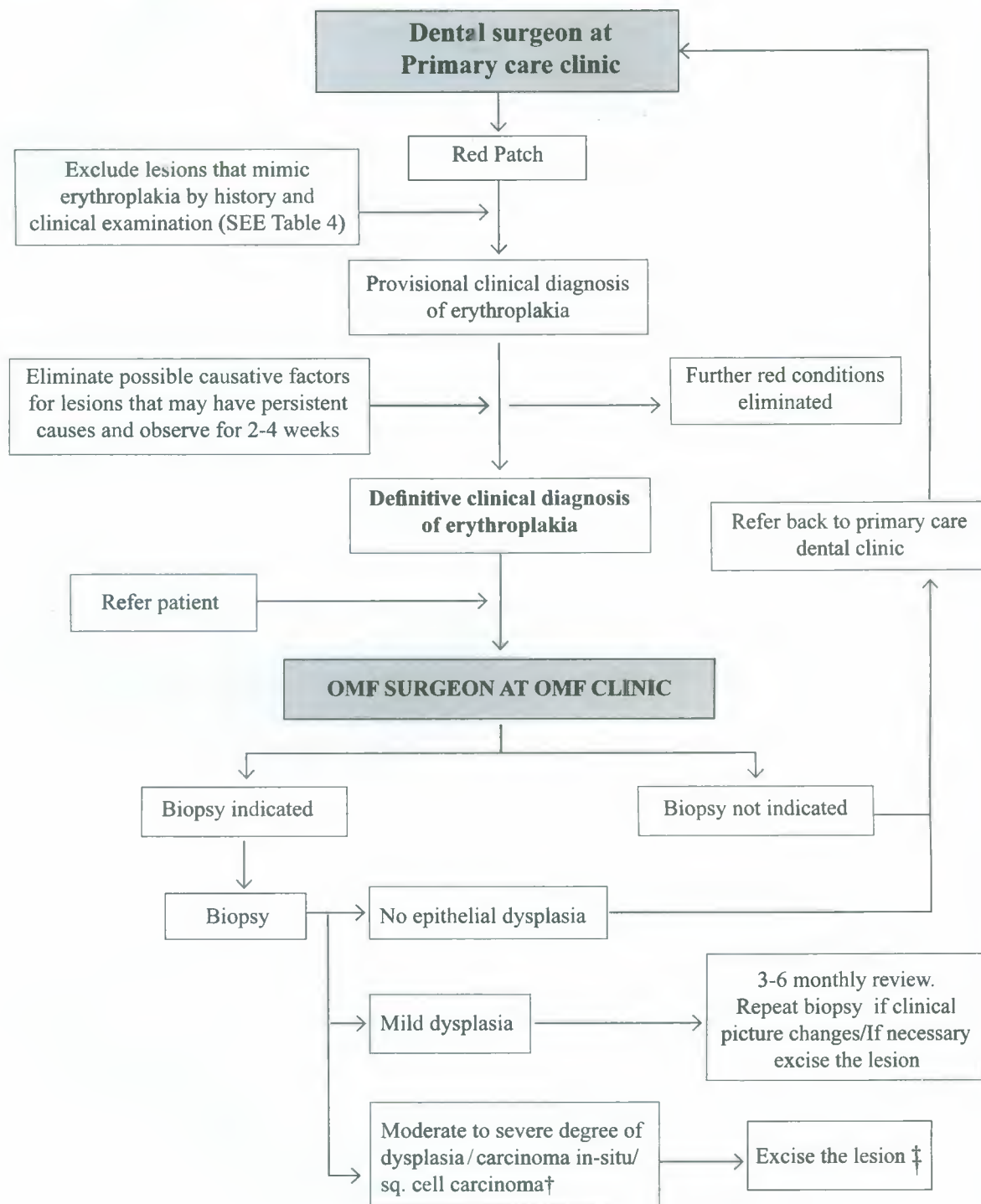
In general, OE needs to be treated because of its high risk for malignant transformation. Besides, most erythroplakias are symptomatic. Surgery, either by cold knife or by laser, is the recommended treatment modality. As for excision of leukoplakia, no guidelines are available with regard to the width of the surgical margins. There are no data from the literature about the recurrence rate after excision of erythroplakia (van der Waal 2010).



**Table 4: Red lesions that need to be considered in the differential diagnosis of oral erythroplakia (adapted from Reichart and Philipson 2005 and Warnakulasuriya et al 2007)**

| Nature of lesion                | Lesion / condition  | Diagnostic features   |
|---------------------------------|---|---|
| Inflammatory / immune disorders | Desquamative gingivitis                                       | Associated mostly with erosive/atrophic lichen planus in other areas      |
|                                 | Erosive/atrophic lichen planus                                | Reticular lesion / striae may be seen in peripheral areas; multiple sites |
|                                 | Discoid lupus erythematosus                                   | Circumscribed lesion with central erythema, with radiating white lines    |
|                                 | Pemphigus, Pemphigoids  | History of bullous eruption and rupture, wider & multiple areas involved  |
|                                 | Hypersensitivity reactions                                    | History of exposure to an allergen; wider area affected                   |
| Infections                      | Reiter's disease  | Non gonococcal urethritis, arthritis                                      |
|                                 | Erythematous candidiasis including denture induced stomatitis | Found on palate and under denture   |
|                                 | Histoplasmosis  | Raised /ulcerated lesion  |
|                                 | Tuberculosis  | Usually ulcerative stellate appearance                                    |
| Hamartomas / neoplasms          | Haemangioma   | Blanching on pressure   |
|                                 | Lingual varices   | Ventral aspect of tongue, symmetrical                                     |
|                                 | Telangiectasia  | Multiple sites and skin involvement                                       |
|                                 | Oral purpura  | Bleeding diatheses present  |
|                                 | Kaposi's sarcoma  | Seen mostly in HIV infected people  |

**Fig. 11: Flow chart for the management of erythroplakia**



† - Follow separate guidelines for sq.cell carcinoma; ‡ No treatment method including surgical excision is shown to prevent development of SCC (Holmstrup, vedtofte 2006) Constructed on model advocated by van der Wall 2010 and modification of model suggested by Warnakulasuriya et al. 2007, Hashibe, et al. 2000)

### 3.3 Oral Submucous Fibrosis (OSF)

Oral submucous fibrosis (OSF) is a potentially malignant disorder associated with burning sensation in the oral mucosa from the early stages and with a significant risk for malignancy. It is a chronic, insidious disease with a progressive fibrosis in the submucosal tissues leading to restriction in opening the mouth with the advancement of the disease (Tilakaratne, et al. 2006; Kerr, et al. 2011). The fibrosis initially affects the lamina propria of the oral mucosa and as the condition progress, extends to the submucosa and the deeper tissues including oral musculature. Consequently the elasticity of the oral mucosa is progressively lost. Malignant transformation varies from 4.5 to 7.6 per cent (Murti, et al. 1985; Ahmad, et al. 2006).

#### Aetiology

Conclusive evidence now exists that the disease is caused by the consumption of areca nut. The condition predominantly affects populations of the Indian subcontinent and South East Asia who chew arecanut in betel quid or in flavoured formulations of the arecanut. Although the disease mostly affects people older than 40 years of age, younger people are increasingly affected, particularly those who consume flavoured arecanut products alone (Tilakaratne, et al. 2006).

#### Pathogenesis

Unlike other OPMDs pathogenesis of OSF has been well elucidated. Although a detailed discussion of the pathogenesis of OSF is beyond the scope of this guideline, an understanding of this aspect of OSF is important. Fibrosis and hyalinization

resulting from increased amount of collagen in the extra cellular matrix of sub epithelial tissues contribute to the important clinical features seen in this condition. It has been shown that either an increased collagen synthesis or reduced degradation of collagen may be responsible for the development of OSF. Alkaloids, specially arecoline in arecanut have been found to stimulate fibroblast proliferation while tannin in the nut appears to stabilize collagen structure that resists degradation by collagenase. Increased secretion of fibrogenic cytokines such as TGF beta and imbalance between matrix metallo proteinases (MMPs) and tissue inhibitors of matrix metallo proteinases (TIMMS) are responsible to altered collagen metabolism leading to fibrosis. The disease is associated with certain genetic groups than in others (Tilakaratne, et al. 2006).

#### Clinical features

The clinical features that are assisting in diagnosing include:

- Burning sensation of the oral mucosa
- Blanching and stiffening of the oral mucosa leading to limitation in mouth opening.
- Widespread pallor of the oral mucosa
- Palpable fibrous bands in cheeks, along the faucial pillars, soft palate and lips
- Tightening of the lips
- Depapillation of the dorsum of the tongue with restricted mobility of the tongue including protrusion
- Depigmentation of the mucosa particularly noticeable on the vermilion border of the lips in a significant proportion of patients
- Vesiculation of the oral mucosa is sometimes described but not often seen.

## Diagnosis of OSF

Diagnosis can be made easily in established OSF based on the above clinical features. In early stages, however, the diagnosis may be difficult to establish purely on clinical grounds. Biopsy is necessary in advanced stages to determine the presence of epithelial dysplasia if there are clinically suspicious features. The condition may need to be distinguished from other diseases that may exhibit fibrosis and may cause limitation in mouth opening such as epidermolysis bullosa, post-irradiation fibrosis, cicatricial pemphigoid, progressive systemic sclerosis etc.

## Staging of OSF

Unlike other OPMDs, OSF is a disorder that is associated with a functional disability. Attempts have been made to stage OSF using mainly clinical/functional criteria (Haider, et al. 2000; Kerr, et al. 2011).

A staging scheme proposed by Kerr, et al. in 2011 is shown in table 5.

**Table 5: Disease grading of oral submucous fibrosis (Kerr, et al. 2011)**

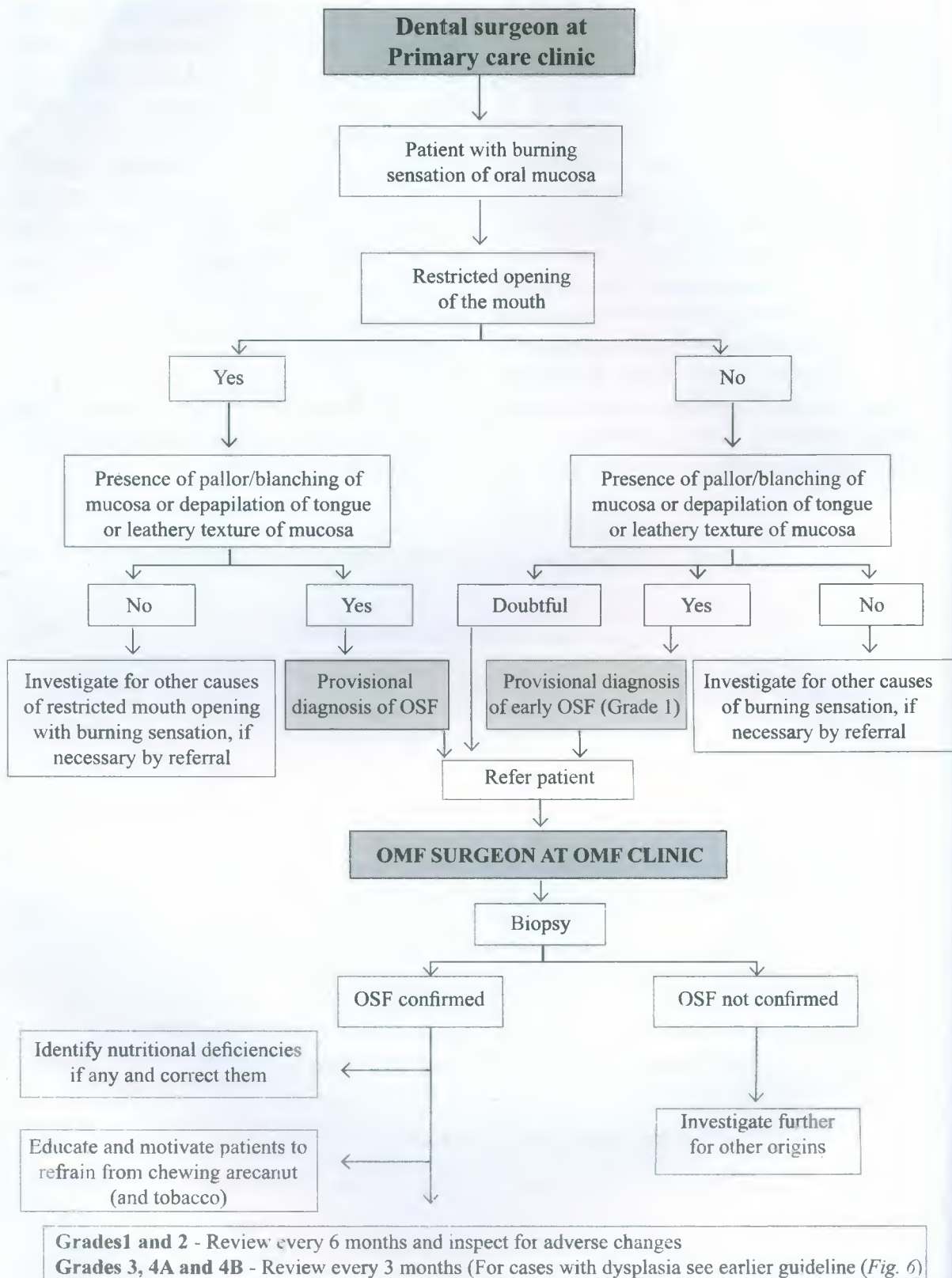
| Grade              | Clinical and functional features  |
|--------------------|---|
| Grade 1 – Mild     | Any feature of the disease triad for OSF ((burning sensation, depapillation, blanching or leathery mucosa) present with inter-incisal opening > 35 mm |
| Grade 2 – Moderate | Above features of OSF with inter-incisal limitation of opening 20 – 35 mm   |
| Grade 3 – Severe   | Above features of OSF with inter-incisal opening < 20mm   |
| Grade 4A           | OSF with other potentially malignant disorder on clinical examination   |
| Grade 4B           | OSF with any grade of oral epithelial dysplasia on biopsy   |
| Grade 5            | OSF with oral squamous cell carcinoma (SCC)   |

## **Treatment of OSF**

There is no single satisfactory and evidence-based treatment method for curing the disease. Physical and medical treatments have all been tried with claims of varying rates of success. Physical methods such as stretching exercises aimed at increasing mouth opening and medical treatments such as intra-lesional injection of corticosteroids have been reported. Intra lesional steroid (for example methyl prednisolone) injection is the widely practised treatment in most centres, especially for symptomatic cases with developing limitation in mouth opening associated with burning sensation (Ariyawardana, et al. 2005). Surgical methods aimed at severing

the fibrous bands in advanced stages have also been attempted but are associated with relapse. None of these methods has satisfied all criteria for randomised controlled trials (Kerr, et al. 2011). Education and habit control among patients has been found to arrest the progress of the disease in early stages although this has not been proven by any randomised controlled trial. Many of the patients suffering from OSF may be affected by iron deficiency anaemia and other nutritional deficiencies (Kerr, Warnakulasuriya et al. 2011). A full blood count is recommended for every patient when the diagnosis of OSF is made. When deficiencies are detected, treatment must be instituted to correct them.

**Fig. 11: Flow chart for the management of Oral Submucous Fibrosis**



### 3.4 Lichen Planus

Oral lichen planus is a common chronic inflammatory mucocutaneous disorder that typically affects the skin and/or mouth (Warnakulasuriya, et al. 2007; George 2011) Lichen planus can also affect other non-oral mucosal surfaces such as the genitals (Ahmad, et al. 2006).

#### Clinical features

- Oral lichen planus has a bilateral distribution (Al-Hashimi, et al. 2007) that typically affects the buccal mucosa, dorsum and ventral surfaces of the tongue and/or gingiva (Napier 2008).
- Other mucosal surfaces can be affected but palatal involvement is particularly rare.
- Oral lichen planus is often asymptomatic (Al-Hashimi, et al.2007; George 2011) although when there are areas of erosion or ulceration, the patient may have variable amounts of discomfort, being particularly troublesome when eating spicy or acidic type of food.
- The variable clinical presentations of oral lichen planus comprise white patches, erosions, ulcers and very rarely, blisters (Al-Hashimi, et al. 2007; George 2011).

The clinical presentation of lichen planus can be classified as follows:

#### Reticular oral lichen planus

This is the most common presentation, manifesting as a network of white striations. These lesions are often painless, although patients may complain of a slight roughness or dryness of the affected mucosal surfaces.

#### Plaque-like oral lichen planus

This manifests as areas of homogenous whiteness. This typically arises on the buccal mucosa or dorsum of tongue and more prevalent among smokers.

#### Papular oral lichen planus

This manifests as small white raised areas approximately 1-2 mm in diameter. This typically arises on buccal mucosa and dorsum of tongue, but may present on other mucosal surfaces as well.

#### Erosive oral lichen planus

This is sometimes termed atrophic oral lichen planus. In this form there are areas of redness within the aforementioned white patches. Patients with this type of disease often complain of oral soreness.

#### Ulcerative lichen planus

There are frank ulcers within the areas of whiteness. Patients complain of continued soreness, this being particularly severe with spicy or acidic foods.

#### Bullous lichen planus

This rare presentation manifests as small vesicles or blisters (bullae) within the white patches.

Patients with disease involving gingiva may have areas of white patches or striae super imposed upon redness of the gums. The latter is often termed desquamative gingivitis and can be extremely painful.

There is a little predictability as regards the frequency of non-oral disease in patients with oral lichen planus. Likewise the oral features may precede, accompany or follow lichen planus affecting other sites.

**Diagnosis**

- The diagnosis of oral lichen planus is initially based upon the clinical presentation of bilateral white patches with or without erosions, ulcers or blisters, typically affecting the buccal mucosa, dorsum of tongue and gingiva (Bombeccari, et al.2011).

**Fig. 13 : Erythroplakia.**

Note the red patch on the right buccal mucosa with white areas posteriorly.



**Fig. 14 : OSF.**

Note the diffuse blanching on the right buccal mucosa, with severe pallor in the retromolar area. Note betel stains on the tongue and teeth.



- Biopsy with subsequent histopathological examination of affected tissue is essential to exclude other disease that may mimic oral lichen planus – such as lupus erythematosus (Bombeccari, et al. 2011).

- In addition, it is advantageous to undertake a biopsy to identify possible areas of cellular atypia (dysplasia) within the involved tissue (Brennan, et al. 2007).

**Fig. 15 : Oral submucous fibrosis.**

Note the blanching on the lower labial mucosa



**Fig. 16 : Erosive Lichen planus**





## **4. Surveillance of Oral Potentially Malignant Disorders**

### **4.1 Introduction**

Surveillance of OPMD is a process of systematic, continuous collection, analysis, interpretation and dissemination of epidemiological information for action on OPMD cases occurring in a particular geographic area.

Surveillance of OPMD provides information about the occurrence (incidence), types (morphology/histology) and locations (site/topography), extent of OPMD at the time of diagnosis (disease stage) and the kinds of treatment that patients receive.

### **4.2 Importance of surveillance of Oral Potentially Malignant Disorders**

- Incidence of OPMD will provide the future burden of oral cancer
- Determine OPMD patterns in various sub populations.
- Guide planning, implementation and evaluation of cancer control programmes (eg. determine whether prevention, screening and treatment efforts are making a difference).
- Help set priorities for allocating health resources.
- Provide evidence for advanced clinical, epidemiological and health services research.

The majority of patients with OPMD are diagnosed by dental surgeons and the identified cases of OPMD are then referred

to the Oral & Maxillo Facial units in state sector hospitals in the respective districts. Twenty six OMF units provide further management and follow-up of these patients. In addition some patients are managed in the private sector.

### **4.3 Process of surveillance of Oral Potentially Malignant Disorders in Sri Lanka**

The National Cancer Control Programme of Ministry of Health, Nutrition and Indigenous Medicine conducts surveillance for oral cancers and OPMD in Sri Lanka.

According to the General Circular No. 01-33/2012, "Register for new patients with oral cancer and Oral Potentially Malignant Disorders" should be maintained at all hospital dental clinics first primary contact level. Dental Surgeons attached to a hospital dental clinic should send the monthly statistics through the Monthly Report of Hospital Dental Clinic to the central level (format H1201). According to the developed guideline, clinically diagnosed patients at the first primary contact level should be referred to the OMF units for further management. A register should be maintained at the OMF clinic and an annual reports should be sent to the National Cancer Control Programme.

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