

Scottish Needs Assessment Programme



Oral Cancer

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Oral Health Network

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EXECUTIVE SUMMARY

In Scotland, approximately 500 new cases of malignant neoplasms in and around the oral cavity are diagnosed and about 230 deaths occur each year from these diseases. This compares with an average of 400 registrations and 95 deaths per annum from malignant melanoma during the period 1981-1990. Approximately 85% of new cases of oral cancer (ie affecting oral cavity or lip) occur in individuals aged over 50 years. The incidence and mortality rates are higher in Scotland than in England and Wales. The majority (over 90%) of malignancies in and around the oral cavity are squamous cell carcinomas.

Since the early 1970s, oral cancer incidence and mortality rates have been increasing, and it has become apparent that these increases are most marked in younger age groups. Oral cancer is twice as common in men as in women, and death from the disease is three times greater in Social Class V than in Social Class I.

There are certain well-established risk factors which predispose to intra-oral squamous cell carcinoma. The most important of these is cigarette smoking, followed by high alcohol consumption. A combination of these two factors results in a synergistic effect giving a relative risk which is not merely additive, but multiplicative. Together they carry an attributable risk of 75-95%. The major risk factor associated with squamous cell carcinoma of the lip is exposure to ultraviolet light. It should, therefore, be possible to prevent a substantial proportion of oral cancers.

Five year survival rates for oral cancer vary according to the particular anatomical site, but overall, have shown little in the way of improvement during the last three decades. It is known that treatment of early lesions results in improved survival and allows more conservative treatment. However, most cases continue to present with advanced disease, and this accounts for the lack of improvement in prognosis as outlined above. Although no significant improvements in cure rates are yet detectable, major advances have been made in reconstructive surgery over the past two decades.

At present, the treatment of oral cancer usually involves long, costly surgical operations and prolonged courses of radiotherapy. The multidisciplinary approach required for such treatment, together with the high dependency of the post-operative patient, results in a significant use of resources and places a heavy demand on services. Treatment often results in facial scarring and functional debilities such as drooling and difficulties with speaking, swallowing and mastication. This can result in substantial physical and emotional strain for the patients and their families.

Although many oral cancers arise *de novo*, several oral conditions can precede oral carcinoma. The detection and diagnosis of such premalignant lesions permits patients to be referred for advice regarding lifestyle modifications and, where necessary, treatment.

If reductions in the incidence of oral cancer and improvements in survival rates and quality of life are to occur, it will be necessary to prevent the development of lesions and to detect and, where necessary, treat premalignant and malignant lesions at an earlier stage.

Compared with other anatomical sites, the oral cavity is an area where it should be relatively easy to detect precancerous and early malignant lesions. In addition, the method of initial detection does not involve costly investigative procedures.

Consequently, screening for oral cancer should be carried out by the dental profession, and a thorough and methodical examination of the oral mucosa and regional lymph nodes should form part of a routine dental check-up. Furthermore, since those with increased risk of developing oral cancer, ie smokers, heavy drinkers, the elderly and those from lower socio-economic groups, are more likely to attend their doctor than dentist, General Medical Practitioners should also be encouraged to examine the oral cavity and regional lymph nodes of high risk patients.

In the absence of randomised controlled trials on oral cancer screening programmes, examination for oral precancer and cancer should be carried out on an opportunistic basis.

Most of the public are unaware of the existence of oral cancer, and of the need to seek advice if white patches, red patches, or ulcers of more than three weeks' duration, are present in the mouth. Further, the association between oral cancer and both smoking and high alcohol consumption is not widely known. This lack of knowledge indicates the need for the adoption of strategies to increase the public's awareness of these issues.

RECOMMENDATIONS

1 Recognition of prevalence and mortality rates

In Scotland, approximately 500 new cases of malignant neoplasms in and around the oral cavity are diagnosed and about 230 deaths occur each year from these diseases. This group of malignancies should therefore be included in any Scottish report dealing with cancer and cancer services.

2 Prevention and Health Promotion

- a) HEBS should continue to assess what health promotion materials are available to inform the public, General Medical Practitioners and General Dental Practitioners of the links between smoking, high alcohol consumption and oral cancer.
- b) Future health promotion materials on smoking cessation and reduction of alcohol consumption, produced by HEBS and other Health Boards, should include information on oral cancer.
- c) As a link has been suggested between oral cancer and the regular use of mouthwashes with high alcohol concentration, the labelling of these products should clearly indicate their alcohol content.
- d) Oral health care professionals should participate in and support health promotion initiatives which seek to encourage smoking cessation and reduced alcohol consumption. Appropriate training, to support behavioural change, should be provided for members of the dental team.
- e) Campaigns should be set up to inform the public of the existence, signs and symptoms of oral cancer. This strategy should increase the likelihood of patients presenting with earlier lesions. Campaigns should emphasise that all patients with unexplained mouth ulcers of more than three week's duration or intraoral red or white patches should visit their doctor or dentist urgently.

3 Detection of Oral Cancer and Pre-Cancerous Lesions

- a) Opportunistic screening for oral cancer should form part of the general oral examination/"check-up" by a dental practitioner and should be carried out within all the various branches of the dental profession.
- b) All adults should be encouraged to attend for regular dental "check-ups", which should include as one of its elements an examination of the oral soft tissues.
- c) To encourage attendance, dental "check-ups" should be free of charge to the patient.
- d) General Medical Practitioners should be encouraged to carry out opportunistic screening for oral cancer in high risk groups, including the elderly and those patients who are known to be smokers and/or have a high alcohol intake.

- e) Continuing postgraduate education on screening for the detection of early and precancerous oral lesions should continue to be provided for General Dental Practitioners, Community Dental Officers and General Medical Practitioners. Where other members of the primary health care team are involved, appropriate training should be provided for these personnel. Consideration should be given to the development of a specific national programme for appropriate health professionals, aimed at oral cancer prevention. Additionally, consideration should be given to the development of national guidelines for the diagnosis and treatment of oral cancer.

4 Economic Evaluation

- a) Economic evaluation of the full costs and effectiveness of treatment for oral cancer should be undertaken.
- b) Studies are also required, perhaps initially using mathematical models, to evaluate the cost-effectiveness of different types of oral cancer screening programmes. These would include opportunistic screening by General Dental and Medical Practitioners.

5 Quality Issues

- a) It is recommended that patients' views should be sought regarding their experiences throughout their treatment for oral cancer. Such ongoing quality assessments should be carried out in all units carrying out treatment.
- b) Thought should be given to the feasibility of performing clinical outcome appraisal to allow comparison of different centres providing oral cancer treatment and different treatment regimens.

6 Research and Development

- a) As no randomised controlled trials have been conducted to evaluate the effectiveness of oral cancer screening programmes, examination for oral cancer should be carried out on an opportunistic basis by dental and medical practitioners. In the short term, research should be undertaken to determine how frequently different population groups should be examined to provide effective opportunistic screening.
- b) It is recommended that further research is undertaken into the aetiology and pathogenesis of oral cancer in younger patients, as individuals in this group are frequently non-smokers and non-drinkers.
- c) The results of research and development projects should be fed into purchasing strategy and practice.

1 INTRODUCTION

In Scotland, there are approximately 500 new cases of cancer in and around the oral cavity each year, and in recent years, the incidence at a number of intra-oral sites has been increasing . Of particular concern is the fact that more cases of oral cancer are presenting at a younger age , and that survival rates have shown little improvement during the last three decades.

The main reason for the lack of improvement in prognosis is the fact that the disease has progressed to an advanced stage before the majority of patients present for specialist treatment .

At present, the treatment of advanced oral cancer entails long, costly surgical operations and prolonged courses of radiotherapy. As the treatment often results in facial scarring and functional debilities it is associated with substantial physical and emotional strain for patients and their families .

One of the Scottish Office health targets (1986-2000) is that there should be a 15% reduction in mortality from cancer among the under 65s . If a reduction in mortality from oral cancer is to occur, this will necessitate earlier diagnosis and treatment.

2 EPIDEMIOLOGY

2.1 Introduction

The vast majority of malignant neoplasms in and around the mouth are squamous cell carcinomas. Oral cancers (ie those affecting the oral cavity and lip) account for between one and four per cent of all malignant disease in the United Kingdom and most Western industrialised countries . In 1990, oral cancer registrations in Scotland represented approximately 2.5% and 1.2% of all male and female cancer registrations respectively . Since the early 1970s, oral cancer incidence and mortality rates have been increasing, and it has become apparent that these increases are most marked in the younger age groups .

2.2 Incidence of Oral Cancer

In Scotland, during the last five years, there were approximately 494 new cases of cancer in and around the oral cavity (ICD-9 sites 140-149) per year (Table 1). During this period, approximately half of this number (228) died with or from the disease each year (Table 2). This death:registration ratio indicates a mortality comparable to that of breast cancer and invasive carcinoma of the uterine cervix and greater than that of melanoma .

The Scottish incidence rates for cancers, ICD-9 sites 140-149, per 100 000, standardised to the World Standard Population, were approximately 9.0 and 3.8 for males and females respectively per annum during the period 1987 - 1991 (Table 1).

The overall incidence rate for oral cancer (excluding ICD - 9 sites 142, 146, 147 and 148) in the United Kingdom is approximately 3.4 per 100 000 population per annum . The incidence and mortality rates are higher in Scotland than in England and Wales. The comparable Scottish incidence rates were approximately 6.0 and 2.4 per 100 000 for males and females respectively per annum during the period 1987-1991.

The overall age adjusted death rate for cancers, ICD-9 sites 140-149, in Scotland is 3.85 per 100 000 population.

2.3 Age Distribution

The incidence of oral cancer increases with age and in the United Kingdom approximately 85% of new cases occur in people aged over 50 years . However, as discussed below, recent reports have shown a trend towards presentation of the disease at an earlier age. The age distribution of case registrations (ICD-9 sites 140-149) for Scotland between 1986 and 1991 is shown in Table 1.

2.4 Sex Distribution

Fifty years ago oral cancer caused five times more deaths in men than in women. However, since then, male rates have fallen proportionally more than female rates and in the United Kingdom at present, the male to female ratios for incidence and mortality are both approximately two to one . These ratios are also applicable to Scotland (see Tables 1 and 2).

Table 1
Scottish Oral Cancer Registrations; by year, sex and age: 1986-1991
Rate per 100 000 standardised to the World Standard Population
ICD-9 140-149

Year	Sex	Age						
		0-9	10-19	20-29	30-39	40-49	50-59	60-69
1986	M	1	2	0	8	29	59	96
	F	1	0	4	5	11	34	42
	T	2	2	4	13	40	93	138
1987	M	1	0	3	10	34	58	79
	F	0	0	4	9	12	27	52
	T	1	0	7	19	46	85	131
1988	M	0	0	3	3	33	73	103
	F	0	3	1	10	17	22	37
	T	0	3	4	13	50	95	140
1989	M	0	0	2	8	41	77	96
	F	0	1	1	6	10	30	50
	T	0	1	3	14	51	107	146
1990	M	0	1	2	9	35	84	104
	F	0	1	1	8	13	38	45
	T	0	2	3	17	48	122	149
1991	M	0	0	3	11	42	70	108
	F	1	0	2	2	7	31	50
	T	1	0	5	13	49	101	158

Source: Information and Statistics Division

Table 2
Deaths from Oral Cancer (ICD-9 140-149), by sex and HBA, 1988-1992

Health Board	Sex	Year				
		1988	1989	1990	1991	1992
Argyll & Clyde	M	17	12	18	13	16
	F	12	7	10	4	4
	T	29	19	28	17	20
Ayrshire & Arran	M	8	10	12	8	10
	F	5	6	10	3	5
	T	13	16	22	11	15
Borders	M	2	2	4	6	3
	F	2	4	0	5	4
	T	4	6	4	11	7
Dumfries & Galloway	M	5	5	4	7	3
	F	2	3	1	3	0
	T	7	8	5	10	3
Fife	M	8	11	10	6	9
	F	2	3	6	3	4
	T	10	14	16	9	13
Forth Valley	M	10	10	6	8	4
	F	1	3	3	4	1
	T	11	13	9	12	5
Grampian	M	13	16	9	12	10
	F	7	7	4	4	10
	T	20	23	13	16	20
Greater Glasgow	M	42	29	38	50	33
	F	18	14	17	14	25
	T	60	43	55	64	58
Highland	M	4	4	5	8	4
	F	2	0	4	2	2
	T	6	4	9	10	6
Lanarkshire	M	15	11	13	15	13
	F	5	7	6	7	7
	T	20	18	19	22	20
Lothian	M	17	21	23	31	23
	F	6	11	14	8	16
	T	23	32	37	39	39
Orkney	M	0	2	0	1	3
	F	0	2	1	1	0
	T	0	4	1	2	3
Shetland	M	0	1	0	1	1
	F	1	0	0	0	0
	T	1	1	0	1	1
Tayside	M	5	9	8	14	12
	F	4	6	6	5	7
	T	9	15	14	19	19
Western Isles	M	1	1	0	1	1
	F	0	1	1	0	1
	T	1	2	1	1	2
Scotland	M	147	144	150	181	145
	F	67	74	83	63	86
	T	214	218	233	244	231

Source: General Register Office for Scotland

2.5 Social Class

Among men in the United Kingdom, deaths from cancers of the lip, mouth and pharynx are three times more common in Social Class V than in Social Class I .

2.6 Geographical Distribution

As discussed previously, incidence and mortality rates from oral cancer are slightly higher in Scotland than in England and Wales. However within Scotland there is no clear geographical pattern of occurrence. The distribution of deaths from cancers in and around the oral cavity by Health Board is shown in Table 2.

2.7 Site Distribution

The number of cases and standardised rates of cancer registrations (ICD-9 sites 140-149) by anatomical site over the past five to six years are shown in Tables 3 and 4 respectively. The tongue is the site most frequently involved, usually affecting the lateral borders. Other sites which are commonly involved are the lip, floor of the mouth, buccal mucosa and retromolar regions.

2.8 Trends with Time

Between 1900 and 1970, the incidence and death rates from oral cancer in the United Kingdom fell, especially in males and particularly for the lip and tongue. While this trend has continued for the lip, in recent years the incidence and mortality rates have started to increase for cancer of the tongue, floor of the mouth and other ill-defined oral sites . Increases in mortality from cancer of the oral cavity and pharynx over the past 20 years have also been reported in almost all EC countries, including Scotland . In Scotland, mouth cancer death rates in men were at their highest in the period 1931-1935, and thereafter the rate fell consistently until 1971-1975. Since then however, there has been an increase in the all-ages rate. Analysis of the rates by age group and birth cohort show that while rates in the oldest age groups have been steadily falling, rates in the younger age groups have been increasing with successive cohorts born subsequent to 1910 . In men aged 35-64 years, there has been a near quadrupling of the mortality rate from mouth cancer between the periods 1971-75 and 1985-89. Incidence rates show a similar trend.

Table 3
Oral Cancer registrations for Scotland by site and year of diagnosis

Site	ICD-9	Year					Total
		1986	1987	1988	1989	1990	
Lip	140	74	74	58	65	61	332
Tongue	141	82	95	78	95	90	440
Salivary Glands	142	66	61	58	51	52	288
Gum	143	16	21	18	20	17	92
Floor of Mouth	144	47	52	72	55	67	293
Other Mouth	145	55	72	68	74	72	341
Oropharynx	146	31	35	38	57	59	220
Nasopharynx	147	18	13	18	26	21	96
Hypopharynx	148	48	36	45	46	49	224
Ill-defined Sites	149	22	15	21	18	22	98
All Sites	140-149	459	474	474	507	510	2424

Source: Scottish Cancer Registration Scheme

2.9 Survival Rates

Five year survival rates for squamous cell carcinomas of the oral cavity depend on the site and stage of the lesion. Staging is by means of the TNM classification (Denox). This takes account of tumour site in relation to adjacent structures as well as the presence of lymph node metastases in the cervico-facial region and distant metastases.

During the past 30 years, there has been little improvement in five year survival rates. Lip cancers have the best prognosis with a five year relative survival rate of 99%, while cancers of the tongue, gum, floor of the mouth and other unspecified parts of the mouth range from only 42-60% .

For all sites, smaller and earlier lesions have by far the best outcome⁷. This emphasises the importance of early detection.

Although no marked improvements in cure rates are yet detectable, major advances have been made in reconstructive surgery over the past two decades. This has greatly improved the quality of life for patients.

Table 4
Scottish Oral Cancer registration rate per 100 000 standardised to the World
Standard Population by cancer site: 1987-1991

ICD 9 Site	Sex	Year				
		1987	1988	1989	1990	1991
140	M	1.6	1.2	0.9	1.2	1.1
Lip	F	0.2	0.3	0.3	0.2	0.2
141	M	1.7	1.5	1.5	1.8	2.2
Tongue	F	0.8	0.5	0.7	0.6	0.8
142	M	0.8	1.0	0.6	0.6	0.7
Salivary Glands	F	1.0	0.6	0.6	0.7	0.2
143	M	0.3	0.2	0.2	0.3	0.1
Gum	F	0.2	0.2	0.1	0.2	0.2
144	M	1.1	1.6	0.9	1.5	1.5
Floor of Mouth	F	0.4	0.5	0.4	0.4	0.5
145 Other &	M	1.0	1.1	1.2	1.2	1.2
Unspec. Mouth	F	0.7	0.8	0.6	0.7	0.7
146	M	0.8	0.8	1.1	1.3	0.8
Oropharynx	F	0.2	0.3	0.4	0.3	0.5
147	M	0.3	0.4	0.4	0.4	0.5
Nasopharynx	F	0.0	0.1	0.3	0.2	0.0
148	M	0.7	0.9	0.6	0.9	1.2
Hypopharynx	F	0.2	0.3	0.4	0.4	0.3
149	M	0.3	0.5	0.3	0.5	0.7
Other & Ill Defined	F	0.2	0.1	0.2	0.2	0.1

Source: Information and Statistics Division

3 AETIOLOGY

3.1 Introduction

There are certain well-established risk factors which predispose to squamous cell carcinoma of the oral cavity and lip. These include lifestyle and environmental factors as well as gender and social class.

3.2 Risk Factors

The most important risk factor associated with intra-oral squamous cell carcinoma is cigarette smoking. High alcohol intake is the second major risk factor¹⁰. Each raises the risk status for oral cancer and a combination of high alcohol consumption allied to heavy smoking results in a synergistic effect giving a relative risk which is not merely additive but multiplicative⁵. Together, they carry an attributable risk of 75-95%.

An increased risk of oral cancer associated with the regular use of mouthwashes high in alcohol content has been suggested but not proven.

Other possible risk factors include the presence of fungal infections¹¹ (ie candida), viral infections such as HPV and HIV, occupational risks, nutritional deficiency¹², physical factors, and recognisable pre-malignant lesions.

In some cultures, betel nut chewing is an important factor¹³. Another risk factor is the use of smokeless tobacco, the production and sale of which are forbidden in this country.

The main risk factor associated with cancer of the lip is exposure to ultraviolet light.

3.3 Disease Determinants and Risk Markers

The following list indicates the determinants and markers of high risk groups and individuals.

Determinants

- Ethnic origin and genetic predisposition
- Age
- Gender
- Social, cultural and behavioural habits
- Occupation
- Dietary Practice
- Carriage of micro-organisms
- Immune Status
- Dental health and oral condition

Markers of high risk lesions

- Clinical signs and symptoms
- Histological, biochemical and molecular changes

4 PREVENTION AND HEALTH PROMOTION

4.1 Primary Prevention and Health Promotion

Theoretically, it should be possible to prevent a substantial proportion of intra-oral squamous cell carcinomas as tobacco smoking and high alcohol intake carry an attributable risk of 75-95%. The benefits of eliminating tobacco use and reducing alcohol intake are well-documented in Western countries, and would reduce mortality from oral cancer as well as from many other diseases.

At present, relatively few people are aware of the links between smoking, high alcohol consumption and oral cancer. Attempts should, therefore, be made to increase the public's awareness of these associations. Health promotion in relation to the prevention of oral cancer should be part of a lifestyle approach which encourages individuals to stop smoking and to reduce their consumption of alcohol.

Smoking is one of the priority areas identified by the Scottish Office in *Scotland's Health, A Challenge To Us All*⁴, and targets relating to a reduction in the number of smokers have been set for the year 2000. In addition, the Health Education Board for Scotland has identified smoking as a priority for Health Education. At local level, many Health Promotion Departments have programmes to encourage smoking cessation. They can also facilitate the health promotion work of other professionals, including members of the dental profession, by the provision of a range of services including training and resource.

As exposure to ultraviolet light is the main risk factor for squamous cell carcinoma of the lip, members of the public should be encouraged to include the lips as well as the skin when applying sun screen.

4.1.1 Recommendations

- a) HEBS should continue to assess what health promotion materials are available to inform the public, General Medical Practitioners and General Dental Practitioners of the links between smoking, high alcohol consumption and oral cancer.
- b) Future health promotion materials on smoking cessation and reduction of alcohol consumption, produced by HEBS and other Health Boards, should include information on oral cancer.
- c) As a link has been suggested between oral cancer and the regular use of mouthwashes with high alcohol concentration, the labelling of these products should clearly indicate their alcohol content.
- d) Oral health care professionals should participate in and support health promotion initiatives which seek to reduce alcohol consumption and encourage smoking cessation. Appropriate training, to support behavioural change, should be provided for members of the dental team.

4.2 Secondary Prevention

Survival rates demonstrate that patients whose cancer is detected at an early stage generally have much longer survival. Earlier detection also allows for much less radical treatment.

A substantial proportion of the general public is not aware that cancer can affect the oral cavity, and the main reason for late referral is delay by the patient in seeking advice. Consequently, it is important that the general public, particularly those with high risk factors, should realise the advantages of early attendance at a dentist or doctor when they become aware of an oral soft tissue abnormality lasting more than a short period of time.

Patients presenting with precancer or early cancer should be referred to specialist hospital departments and also given appropriate advice and support on the need to make behavioural changes in relation to smoking and drinking.

4.2.1 Recommendations

Campaigns should be set up to inform the public of the existence, signs and symptoms of oral cancer. This strategy should increase the likelihood of patients presenting with earlier lesions. Campaigns should emphasise that all patients with unexplained mouth ulcers of more than three weeks' duration or intraoral red or white patches should visit their doctor or dentist urgently.

5 SCREENING

5.1 Introduction

Many oral cancers present as new lesions without the patient or clinician being aware of any pre-existing mucosal abnormality. However, several oral conditions can precede oral carcinoma. People with these conditions are at a greater risk of developing oral cancer than normal populations, even though the rate of malignant transformation is low, at between 2 and 6%.

Detection of early cancer and premalignant lesions permits patients to be referred for specialist advice and, where necessary, treatment. Where there is no evidence of malignant change, patients may be advised to modify their lifestyle. As outlined above, referral of patients with early cancerous lesions may permit less radical treatment and may result in increased survival rates.

Screening initiatives for oral precancer and cancer have been reported in several countries including Sri Lanka¹⁴, Germany¹⁵ and the United States¹⁶. During the past few years, there has been an increased awareness in the United Kingdom of the need to screen for such lesions^{17,18,19,20}. Studies are currently being undertaken in England to assess the efficacy of general dental practitioners as screening examiners, and to validate a screening programme²¹.

5.2 Screening Examination

Compared with other anatomical sites, the oral cavity is an area where it should be relatively easy to detect precancerous and malignant lesions. A thorough and methodical examination of the mucosal surfaces of the mouth²² and regional lymph nodes should be carried out in good and adequate lighting²². This should be undertaken by clinicians trained to detect oral mucosal abnormalities.

5.3 Screening Personnel

General Dental Practitioners are in an advantageous position to examine the oral cavity. They should be encouraged to take a particular interest in the elderly, smokers and those who drink heavily. However, examination of the oral mucosa should be a normal component of a routine dental check-up for everyone. Free dental examinations would encourage more patients to attend their dentists on a regular basis. Consequently, as recommended by the House of Commons Select Committee on Health²³, the free dental check-up should be re-introduced.

While the vast majority of the population are registered with a General Medical Practitioner, fewer than 50% of adults²⁴ in Scotland are registered with a General Dental Practitioner for continuing care²⁴. An important opportunity to screen for oral cancer, therefore, lies with General Medical Practitioners, especially as there is a high frequency of medical consultation by the elderly and heavy smokers.

The increasing incidence with age and consequently in the population supervised by geriatricians suggests that they too will be in a good position to examine the older population for oral malignancy. Dentists in the Community Dental Service also have an important role to play.

5.4 Premalignant Lesions

Screening should take into account the risk factors and disease determinants outlined in sections 3.2 and 3.3, as well as visual examination for leukoplakias and erythroplakias.

Overall, malignant transformation occurs in 3-6% of leukoplakias over 10 years²², while for erythroplakias, existing malignancy or malignant transformations approaches 28% or higher.

5.5 Research

In "Screening for Oral Cancer and Precancer", a report of the United Kingdom Working Group on Screening for Oral Cancer, 1993²⁵ it was recommended that a randomised controlled trial should be set up, based on a number of centres nationwide, to evaluate the effectiveness of an oral cancer screening programme. However, to date no decision has been taken to set up such a trial. Consequently, at present, it is appropriate to screen for oral cancer on an opportunistic basis and to conduct research using a retrospective study design to help determine how frequently different population groups should be screened in this manner. It is anticipated that the frequency may vary depending on factors such as age and lifestyles.

5.6 Recommendations for Screening

- a) Opportunistic screening for oral cancer should form part of the general oral examination/"check-up" by a dental practitioner and should be carried out within all the various branches of the dental profession.
- b) All adults should be encouraged to attend for regular dental "check-ups", which should include as one of its elements an examination of the oral soft tissues.
- c) To encourage attendance, dental "check-ups" should be free of charge to the patient.
- d) General medical practitioners should be encouraged to carry out opportunistic screening for oral cancer in high risk groups, including the elderly and those patients who are known to be smokers and/or have a high alcohol intake.
- e) Continuing postgraduate education on screening for the detection of early and pre-cancer should continue to be provided for General Dental Practitioners, Community Dental Officers and General Medical Practitioners. Where other members of the primary health care team are involved, appropriate training should be provided for these personnel. Consideration should be given to the development of a specific national programme for appropriate health professionals aimed at oral cancer prevention. Additionally, consideration should be given to the development of national guidelines for the diagnosis and treatment of oral cancer.
- f) Research should be undertaken to determine how frequently different population groups should be examined to provide effective opportunistic screening.

6 DIAGNOSIS

6.1 Clinical Examination

In most cases the diagnosis of oral cancer is not difficult and careful examination of the oral cavity and oro-pharynx will reveal the presence of the tumour. The patient history may indicate the rate of growth of the lesion and will give information on the patient's nutrition. It will also elicit the presence of co-existing problems such as heavy smoking, high alcohol intake, and rarely betel nut chewing. Most importantly it will also identify, in some cases, co-existing disease such as alcoholic liver disease, chronic obstructive airways disease and thrombolytic problems related to peripheral and cerebro-vascular disease.

Thorough examination of the head and neck is mandatory as is a full physical examination. In the oral cavity or oro-pharynx, the presence of a tumour may be revealed by ulceration, a tumour mass, or changes in a premalignant condition. The presence of alcohol and smoking related disease usually becomes evident and there is often associated caries, periapical infection and periodontal disease.

6.2 Investigations

In the general evaluation of the patient it is essential that the tumour size, site, stage and histological type are carefully recorded.

Investigations include routine haematology and biochemistry, liver function tests with a coagulation screen, blood grouping, chest X-ray, ECG and routine urine analysis.

In any assessment of the tumour, a biopsy is essential, accompanied by in some cases a fine needle aspiration of suspected enlarged lymph nodes. Detailed assessment of the tumour is often obtained by examination under general anaesthesia, at which time pharyngoscopy and, if required, bronchoscopy can be carried out to exclude the presence of a synchronous primary.

In the radiological assessment an orthopantomograph is essential and more detailed views are sometimes required to assess bone involvement by the tumour prior to surgery. Similarly when the tissue involvement extends into the neck or pharynx then CT scanning is valuable. Other forms of scanning have a limited place.

An assessment of the patient's nutritional status is required before any treatment and this status frequently needs to be improved.

7 TREATMENT

The type of treatment carried out depends not only on the extent of disease associated with the lesion but also on other factors such as intercurrent disease, consent to treatment, age, particular expertise of available staff, availability of radiotherapy, consultants' attitudes and preferences.

The main interventions in the treatment of premalignant and malignant disease are:

- i) Preventive for premalignant lesions
- ii) Curative ranging from early surgical treatment to late treatment which may involve radical surgery plus radiotherapy
- iii) Palliative (early) this may involve surgery/radiotherapy and/or chemotherapy to primary lesion
- iv) Palliative (late) surgery/radiotherapy, hospice care, care in the community
- v) Long-term follow-up

Following staging of the tumour a decision has to be made as to the most appropriate modality for treatment - that is, surgery or radiotherapy or, commonly, a combination of both. Chemotherapy is used on a limited basis for palliation. There are distinct treatment protocols according to the stage and site of the disease. For small T1 and T2 tumours, surgery and radiotherapy are equally successful. For large tumours a combination of surgery and radiotherapy is generally used.

Where there is any likelihood of radiotherapy being given, a meticulous dental assessment is required with removal of all at-risk teeth either at the time of biopsy or before surgery and radiotherapy. A comprehensive oral hygiene programme must be initiated.

Radical surgery often requires extensive reconstruction. Only occasionally is primary closure effected and usually free grafts, local flaps, distant flaps or free flaps with microvascular anastomosis are used depending on the extent of the defect created. It is essential that complete clearance of the tumour is obtained and that reconstruction is used to close the defect and rehabilitate the patient. This may include replacement of not only soft tissue but also bone in a functional and aesthetic way.

For larger tumours, radiotherapy is normally given after surgery at a dose of around 6000 gray over six weeks. An alternative approach of radical radiotherapy followed later by salvage surgery is sometimes used. In a significant proportion of cases, spread to the adjacent lymph nodes is present at first presentation. Where spread is unilateral, either functional or radical dissection and removal of lymph nodes is required. Radical neck dissection has a higher degree of morbidity and tends to be reserved for those cases where there is extensive lymph node involvement in the neck. Where both sides of the neck are involved a radical neck dissection is carried out on the worst affected side and a functional dissection on the other to avoid intracranial cerebro-vascular problems. It is thought that chemotherapy plays no

significant part in the curative treatment of oro-pharyngeal cancer. However, for palliation, the two regimes probably most commonly used are:

- 1 low dose methotrexate; and
- 2 a Price Hill regimen including 5 fluorouracil, folinic acid, bleomycin and prednisolone.

The process of surgery requires skilled anaesthesia, followed by intensive care facilities, often the use of a tracheostomy, antibiotic therapy and wound drainage, all of which consume large amounts of resource.

8 PROGNOSIS AND REHABILITATION

Following initial recovery from surgery, extensive post-operative management is essential and includes adequate nutrition and general rehabilitation of the patient.

8.1 Prognosis and Follow-up

The success rate with lesions on the lip is very much higher than with lesions of the tongue and elsewhere in the oral cavity.

Long-term follow-up is essential and continuing searches for second primaries should be carried out. The management of precancerous lesions in these patients is either by surgical removal and split skin grafting of the area or alternatively by the use of the carbon dioxide laser.

8.2 Rehabilitation

The long term rehabilitation of patients with oral and pharyngeal cancer is often difficult because of the problems with reconstruction. There is a significant role for the expert restorative dentist in the reconstruction of the jaws with full or partial dentures. From time to time these prostheses need to be stabilised more effectively with implants. These are also widely used craniofacially where there has been loss of soft tissue or a normal structure - for example, nose, ear, orbit. This requires not only the services of a surgeon interested in the field of implantology but also the expertise of the prosthodontist and a maxillofacial back-up laboratory. Only thus may the patient become socially accepted, have a normal appearance and be able to feed themselves and adjust to life.

8.3 Social Impact

Rehabilitation of the patient who has had major surgery and radiotherapy for the curative treatment of oro-pharyngeal cancer with metastases in the neck is a significant problem. The main areas which need to be considered are aesthetics and function.

Problems are related to the extent of scarring, the loss of normal lip tone, the inability to wear dentures, problems with drooling and inability to appreciate normal sensation in the lips and tongue. There are also problems associated with altered speech, difficulties with mastication and swallowing and sometimes difficulty with the airway.

There may also be interference with function of the hand and forearm where a radial microvascular flap has been used for reconstruction. In some cases there will be the necessity for the insertion of implants into the bone or for bone grafting to allow for further reconstruction and prosthodontic work.

There may also be difficulties with oral hygiene and the retention of the appliance in the mouth when implants are not available.

9 USE OF RESOURCES

The treatment of all but the most minor oral cancer lesion requires a multidisciplinary approach and this, allied to the very high dependency of the post-operative patient, results in significant use of resources and places a heavy demand on the service.

Services associated with the diagnosis, treatment and long term follow-up of oro-pharyngeal cancer patients include; out-patient clinics; diagnostic services such as laboratory and radiological services; surgery, anaesthetics and theatre time; intensive therapy and high dependency units; bed usage in surgical wards; radiotherapy; pharmaceutical services; restorative dental services; speech therapy; dietetic services; community care services following discharge; and hospice services where necessary.

The availability of the above services will, to some extent, influence the provision of the overall treatment to patients in different localities.

9.1 Personnel Involvement

The management of oral and pharyngeal cancer requires a team effort and preferably one which works constantly together. This would include the Surgical Team, Anaesthetist, Radiotherapist, Speech Therapist, Nursing Staff, Prosthodontist, Hygienist and Dietician. Surgery may be carried out by an oral and maxillofacial surgeon, a plastic surgeon or an ENT surgeon. Occasionally, general surgeons carry out some of this surgery. The expertise of the principal surgeons involved in this type of treatment varies and the different specialties have different expertise to offer. The presence of teams with colleagues of equal status can result in improved quality of care and the use of a wide range of surgical procedures, both ablative and reconstructive.

The radiotherapist should be an integral part of the team. Due consideration must be given to the place of radiotherapy in the management of these tumours. The services of trained counsellors are an essential component of the care of patients in whom a diagnosis of oral or pharyngeal cancer has been made. These services should be available at the time of diagnosis and during the course of treatment. Additionally, for the terminally ill, skilled counsellors should be available from the community services.

The skilled assistance of prosthodontic and maxillofacial technology services is absolutely essential and dedicated personnel are much more likely to achieve success than referral to primary care services. However, care in the community from general dental practitioners or community dental officers may be essential in the management of routine individual dental problems and the maintenance of oral hygiene.

9.2 In-patient Statistics

In Scotland during the period 1986-1991 there were on average 1020 admissions per year for the treatment of malignant neoplasms in and around the oral cavity (ICD-9 sites 140-149). Patients treated for these diseases have a high number of readmissions. Of the 1020 admissions described above, an average of 314 (30.7%) were elective readmissions and 91 (9%) were readmitted within one year as emergencies for the treatment of the disease.

During the period 1988-1992 there were, in Scotland, an average of 1447 discharges annually following treatment, where the main diagnosis was cancer in and around the oral cavity. The mean length of stay ranged from 11.8 to 13.8 days, giving an average number of occupied bed days per year of 18 619 (Table 5). These patients were discharged from a wide variety of specialties. The greatest number being discharged from ENT, Plastic Surgery, Oral Surgery and Radiotherapy.

Table 5
Oral Cancer (ICD-9 sites 140-149) by year of treatment showing all discharges, mean stay and occupied bed days

Year	Discharges	Mean Stay	Occupied Bed Days
1988	1339	13.8	18478
1989	1347	13.3	17915
1990	1507	13.5	20344
1991	1512	12.1	18295
1992	1531	11.8	18065
Total	7236	-	93097

Source: Information and Statistics Division

10 ECONOMIC APPRAISAL

10.1 Treatment

It is recognised that an estimate of costs associated with the treatment of oral cancer forms an important component of the health needs assessment. This should take into account the total cost of care and impact on survival and quality of life²⁶.

At present, the costs of treating oral cancer are not known. In England, it has been estimated that, on the basis of in-patient days, the cost per case of treating oral cancer is approximately £4800²⁷. However, it is recognised that this is a gross underestimate of total costs as it does not take into account the expensive nature of the treatment (eg intensive care, radiotherapy, rehabilitation) or costs associated with out-patient care²⁷. It has been reported that the cost of treating small lesions is substantially less than the average cost described above. The equivalent estimated cost, based on in-patient days, is approximately £244²⁷. This would, therefore, suggest that early detection, allowing more conservative treatment of oral tumours, may result in substantial cost savings²⁷.

As discussed above, it is not currently possible to estimate accurately the full costs of oral cancer care, and further research is required to calculate the full economic costs of treating oral cancer at different stages and by different clinical regimens²⁷. Further, costs incurred by the patients, their relatives and other agencies will also require to be evaluated on the same basis.

10.2 Screening Programme

Screening tests for the detection of premalignant or malignant lesions of the oral cavity are relatively simple and do not involve costly procedures such as radiography or laboratory investigations. In addition, compared with other sites, the oral cavity is an area where it should be relatively easy to detect early lesions.

However, appraisal of the possible costs and benefits of a screening programme for the early detection of oral cancer or premalignant lesions is very complex²⁷. Factors such as incidence, mortality and treatment, together with choice of target population and uptake of the programme by the target population have to be considered. Further, the sensitivity, specificity and acceptability of the test have to be estimated along with the benefits associated with earlier treatment of the disease. This latter assessment would include financial savings together with measures such as quality of life for the patient and years of life saved. At present, due to a lack of information regarding many of the factors outlined above, it is extremely difficult to carry out meaningful economic appraisal of an oral cancer screening programme²⁷.

The Working Group on Screening for Oral Cancer and Precancer²⁵ has recommended that the economic costs and quality of life implications of screening for oral cancer and precancer should initially be estimated using mathematical computer simulated models. In the longer term, estimates may be available from the results of the randomised controlled trials which the Group has recommended should be set up to evaluate the effectiveness of an oral cancer screening programme.

Until such economic estimates are available, it is recommended that the screening for oral cancer and precancer should be carried out on an opportunistic basis by dental and medical practitioners.

11 QUALITY ISSUES

As treatment of oral cancer frequently involves radical surgery, a survey by questionnaire of patient assessment of treatment provided at one clinic in Scotland was carried out (see Appendix 1). This survey took place in December 1993 and January 1994 at the Plastic and Maxillo-Facial Unit at Canniesburn Hospital, Glasgow. This unit can be regarded as a centre of excellence for the diagnosis and surgical treatment of oro-facial abnormalities. The aim was to assess patient satisfaction with the following aspects of their care: waiting times; perceived quality of treatment generally; information provided; follow-up care; post-treatment appearance and function; prostheses; pain control and recurrence of original complaint.

11.1 Method

The survey was undertaken by a patient questionnaire, which was administered by the staff at the Unit.

Patients attending the combined review clinic were asked to complete the questionnaire and 46 patients did so. Most filled in the form while waiting for their appointment, and three posted the completed questionnaire back to the Unit. No clinician was present in the waiting area while the questions were being answered, the patients doing this by themselves without any prompting from staff.

11.2 Results

11.2.1 Waiting Times

Almost three-quarters of the respondents indicated that the time between referral by their doctor or dentist and the consultant outpatient appointment was less than four weeks, and indicated that this length of interval was acceptable.

Similarly, almost three-quarters indicated that the time between the first consultation and the start of treatment was less than four weeks. Almost two-thirds of this group considered that the length of waiting time was acceptable.

11.2.2 Quality of Treatment

Most respondents (44 of the 46) indicated that they were satisfied with the quality of specialist treatment provided, only one stating that he was not satisfied.

11.2.3 Information Provided

Forty one answered that they were satisfied with the information they were given about their condition and its treatment. Four gave no answer to this question and one recorded dissatisfaction, commenting that the consultant was rather abrupt.

11.2.4 Follow-up Care

Patients were asked to record their satisfaction or otherwise with the following aspects of back-up care: speech therapy; dietician/dietary support; dental care; pain control; support/self help/counselling; and other care. The responses are shown in Table 6.

Table 6
Patients' perception of follow-up care

	Satisfied	Dissatisfied	Not applicable	No response
Speech Therapy	20	0	16	10
Dietician/ Dietary Support	27	1	9	9
Dental Care	37	0	4	5
Pain Control	26	1	8	11
Support/Self- help/Counselling	22	1	12	11
General Post- treatment Care	43	1	0	2

11.2.5 Post-treatment Problems

Patients were asked to indicate whether or not they had experienced post-treatment problems regarding appearance; function; prostheses; and pain. The responses are shown in Table 7.

Table 7
Post-treatment problems

	None	Moderate	Severe	No response
Appearance	31	10	1	4
Function	27	11	2	6
Prostheses	28	8	1	9
Pain	31	4	1	10

Eleven patients had been re-admitted due to recurrence of the original condition. Three patients did not respond to the question regarding re-admission.

11.3 Discussion

The responses to this questionnaire showed that, in general, there was a very high level of patient satisfaction with all aspects of care. However, a significant number of patients reported post-treatment problems at a moderate or severe level. For example, 28% and 24% of those surveyed reported post-treatment problems associated with function and appearance respectively. These results support the opinion outlined earlier that the current treatment of oral cancer is often associated with significant post-treatment morbidity. These findings again emphasise the need

for earlier detection and treatment of such lesions. This, in addition to improving survival rates, would allow treatment of a more conservative nature to be carried out.

11.4 Recommendation

This pilot survey was carried out in only one unit and over a short period of time. It is recommended that patients' views should be sought in this way with regard to all aspects of their treatment for oral cancer. Such studies should be carried out in all units carrying out such treatment and should allow comparison of different treatment regimens.

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APPENDIX 1

PATIENT QUESTIONNAIRE

The purpose of this questionnaire is to help assess the quality of your dental/oral care for Oral/Facial Cancer.

It will look at quality issues from your point of view and will be concerned with your experiences.

Your responses will be used to help other people who have similar treatment locally and within Scotland.

Your reply will be totally confidential.

1 How long was it from the time you were referred by your doctor or dentist until you saw the consultant/specialist?

Less than 2 weeks

2 - 4 weeks

Greater than 4 weeks

Do you think this is acceptable? Yes

No

If no, do you have any further comments?

2 How long was it from the time you first attended the consultant/specialist until your treatment began?

Less than 1 week

2 - 4 weeks

More than 1 month

Do you think this is acceptable? Yes

No

If no have you any further comments?

3 Were you satisfied with the quality of specialist treatment you received?

Yes

No

If no, do you have any further comments ?

4 Were you satisfied with the information/consultation about your condition and its treatment?

Yes

No

If no, do you have any further comments ?

5 Were you satisfied with the following aspects of back-up care provided?

	Yes	No	Not Applicable
a) Speech Therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Dietician/Dietary Support		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
c) Dental care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Pain control		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
e) Support/self-help/counselling		<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
f) other, please specify			

6 Were you generally satisfied with your care after treatment?

Yes

No

If not, please say why

7 Have you had or are you having any problems following your treatment in relation to:-

	no problems	moderate problems	severe problems
a] Appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b] Function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c] Prostheses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d] Pain control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8 Have you been re-admitted for a recurrence of your original condition?

Yes

No

9 Have you any other comments to make about your care?

THANK YOU FOR YOUR ASSISTANCE