Dental Health Foundation
Ireland

National University of Ireland, Cork

DEPARTMENT OF HEALTH AND CHILDREN

Oral Health

in Ireland

Oral Health Services Research Centre
National University of Ireland Cork
and
The Dental Health Foundation, Ireland

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First Edition 1999

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DEPARTMENT OF HEALTH AND CHILDREN

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Further copies of this publication are available from the Oral Health Services Research Centre Cork or the Dental Health Foundation see Appendix 1 (Page 38)

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Foreword

Brian Cowen T.D., Minister for Health and Children

I am very pleased to be associated with this important initiative to promote oral health in Ireland. Oral health promotion and preventive programmes are a key element of the "Dental Health Action Plan", published in 1994, by my Department.

This initiative will greatly increase the understanding as health professionals, and ultimately the wider public, of currently accepted norms and practices that impact on oral and dental health. The focus on common risk factors that affect both general and dental health should be of great value to all those with an interest in promoting health.

I am confident that this publication will facilitate the imparting of accurate information to the public, empowering people to take action to protect their own oral health and using dental services wisely.

I would like to thank the Dental Health Foundation and the Oral Health Services Research Centre, University College, Cork for their collaboration in the preparation of this document.

Brian Cowen, T.D.,
Minister for Health and Children

Chapter 1
INTRODUCTION

The publication of "Shaping a Healthier Future, A Strategy for Effective Health Care in the 1990's" by the Department of Health & Children in 1994 is rightly regarded as a major turning point in the development of health policies in the Republic of Ireland. One of the key elements of the strategy outlined in this publication is the orientation of the health services "towards a health promotion approach based on encouraging people to take responsibility for their own health and on providing the environmental support necessary to achieve this". In the subsequent Dental Action Plan, published in May 1994, the development of "oral health promotion and preventive programmes" was highlighted.

Oral health promotion should follow the principles defined in the W.H.O. Ottawa Charter (1986) for health promotion generally which include creating healthy public policy, creating supportive environments, strengthening community action, developing personal skills and re-orientation of dental services. The W.H.O. 1997 Jakarta Declaration, while re-endorsing the principles of the Ottawa Charter, identifies the need to break through traditional boundaries and for the creation of new partnerships for health between the different sectors at all levels of governance in societies. Health promotion is placed firmly at the centre of health development. As such, it is relevant for both developing and developed countries. The Jakarta Declaration identified five priorities for health promotion in the 21st Century:

- *to promote social responsibility for health*
- *to increase investments for health development*
- *to consolidate and expand 'partnerships for health'*
- *to increase community capacity and 'empower' the individual in matters of health*
- *to secure an infrastructure for health promotion*

Over the last four years each community care programme of the eight health boards, including the dental staff, have been developing and conducting different oral health promotion programmes. Many of those working on these programmes have utilised the services of the Dental Health Foundation. During the course of these activities it became clear that all health professionals, not just dentists, dental hygienists and dental health educators, had an essential role to play. One factor mentioned frequently by those involved was the need for a single publication in which the current scientific knowledge of the different oral diseases and conditions is presented. Hence this publication.

The aim of this publication is to provide a concise scientifically based document on oral health promotion for use by health professionals in the Republic of Ireland. The document sets out to:

- *embrace the contents of current government policy documents in the area of public health*
- *provide relevant information on the current oral health status and oral health practices of Irish children and adults*
- *define the determinants of oral health and disease*
- *define oral health terminology*
- *enumerate common risk factors between oral health and general health*
- *document methods of disease prevention*
- *provide information on nutrition and oral health*
- *provide general information on oral health care products*
- *provide information on oral health care services in the Republic of Ireland*
- *document sources of information on oral health in the Republic of Ireland*

Chapter 2
THE HEALTHY MOUTH

Structure and function is a useful starting point for the consideration of factors affecting the mouth. This chapter provides a definition of what we mean by oral health. There follows some background information on the development of the teeth and a description of tooth types, their structures and the numbering systems used to describe them. The chapter continues with an overview of saliva, which plays an essential role in the oral environment. Finally, dental plaque is described.

Oral Health

Oral health is achieved when the teeth and oral environment are not only healthy but also:

- *comfortable and functional, that is food can be chewed thoroughly and without pain or discomfort and the teeth are not sensitive to different stimuli such as cold*
- *social acceptability is also of importance and the mouth must not give rise to bad breath, the appearance of the teeth and gums should be acceptable and not give rise to embarassment*
- *there should be an absence of sources of infection which may affect general health*

This state of oral health should persist for life, which given a healthy lifestyle, is achievable for the majority of the population.

Development of Teeth

Before Birth

By the third week after conception the primitive mouth has formed. Over the next few weeks the tongue, jaws and palate develop. During the sixth week formation of the teeth commences, and by eight weeks all of the primary (deciduous) incisors, canines and molars are discernable. The permanent teeth begin to develop shortly afterwards.

After Birth

The development of the teeth within the jaw continues after birth. Normally the primary teeth start to appear in the mouth around six months after birth. The primary central incisors, lateral incisors, first molars, canines and second molars appear in this order at intervals from 6-24 months. For each tooth type, lower teeth tend to appear about two months before the uppers. By two years most children have their full compliment of 20 primary teeth, that is five on each side of the midline of the top and bottom jaws.

As the child grows the jaws grow and spaces may begin to appear between the primary teeth. This growth makes spaces for the larger permanent teeth. The growth in jaw length also accommodates the permanent molar teeth, which appear behind the primary teeth.

The first permanent teeth to appear in the mouth are normally the four first permanent molars. These erupt at around age six years behind the primary teeth. At the same time the two lower central primary incisors begin to loosen and then fall out and are replaced by the lower central permanent incisors. Over the following six years (6-12) the remaining 18 primary teeth fall out and are replaced by permanent teeth. At about age 12 the four second permanent molars appear behind the first permanent molars. The last teeth to appear are the 3rd molars or wisdom teeth. Not everybody has 3rd molars and there is considerable variation in the age at which they erupt.

Teething

During the first two years of life many symptoms have been attributed to teething. The most common side effect of teething is drooling. Symptoms of teething may include disturbed sleep, feeding irritability and swollen tender gums. The response to tooth eruption is very varied however; other more severe symptoms such as diarrhoea, fever and convulsions should not be attributed to teething and require medical attention.

Tooth Types

There are four different tooth types in the mouth.

The **incisors** at the front of the mouth have a sharp biting surface and are used for cutting or shearing food into small chewable pieces. There are eight incisors in both primary and permanent dentitions.

The **canines** are situated at the 'corners' of the dental arches. They have a sharp, pointed biting surface. Their function is to grip and tear food. There are four canine teeth in both primary and permanent dentitions.

The **premolars**, unlike the incisors and canines, have a flat biting surface. Their function is to tear and crush food. They are unique to the permanent dentition which has eight premolars.

The **molars** are the largest of the teeth. They have a large flat biting surface. The function of the molars is to chew, crush and grind food. There are eight molars in the primary dentition and twelve in the permanent dentition.

Key Points

- There are 20 primary teeth
- Lower incisors are usually the first teeth to erupt at about 6 months. All 20 primary teeth are usually in the mouth by about 2 years
- There are 32 permanent teeth including 4 wisdom teeth
- The first permanent teeth to erupt (usually at about 6 years) are the 4 first permanent molars behind the last primary teeth. Incisors erupt between 7 and 8 years.

Tooth Eruption

PRIMARY TEETH

ERUPTION TIMES OF PRIMARY TEETH

	Tooth	Eruption (months)
Upper	Central incisor	$7^{1}/_{2}$
	Lateral incisor	8
	Canine	16-20
	First molar	12-16
	Second molar	21-30
Lower	Central incisor	$6^{1}/_{2}$
	Lateral incisor	7
	Canine	16-20
	First molar	12-16
	Second molar	21-30

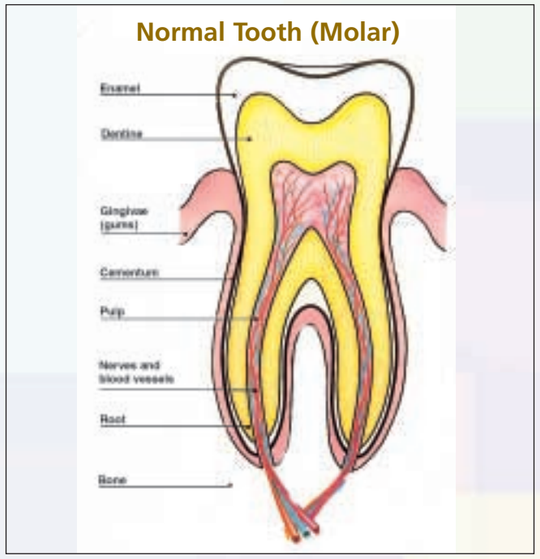
PERMANENT TEETH

ERUPTION TIMES OF PERMANENT TEETH

	Tooth	Eruption (years)
Upper	Central incisor	7 - 8
	Lateral incisor	8 - 9
	Canine	11 - 12
	First premolar	10 - 11
	Second premolar	10 - 12
	First molar	6 - 7
	Second molar	12 - 13
	Third molar	17 - 21
Lower	Central incisor	6 - 7
	Lateral incisor	7 - 8
	Canine	9 - 10
	First premolar	10 - 12
	Second premolar	11 - 12
	First molar	6 - 7
	Second molar	12 - 13
	Third molar	17 - 21

The Structure of a Tooth

The tooth has two anatomical parts. The crown of a tooth is that part of the tooth which is covered with enamel and this is the part usually visible in the mouth



The root is the part embedded in the jaw. It anchors the tooth in its bony socket and is normally not visible.

Structures of the tooth

ENAMEL	*The hard outer layer of the crown. Enamel is the hardest substance in the body.*
DENTINE	*Not as hard as enamel, forms the bulk of the tooth and can be sensitive if the protection of the enamel is lost.*
PULP	*Soft tissue containing the blood and nerve supply to the tooth. The pulp extends from the crown to the tip of the root.*
CEMENTUM	*The layer of bone-like tissue covering the root. It is not as hard as enamel.*

Structures around the tooth

Periodontal ligament: Made up of thousands of fibres which fasten the cementum to the bony socket. These fibres anchor the tooth to the jaw bone and act as shock absorbers for the tooth which is subjected to heavy forces during chewing.

Gingivae (gums): Soft tissue that immediately surrounds the teeth and bone. It protects the bone and the roots of the teeth and provides an easily lubricated surface.

Bone: Provides a socket to surround and support the roots of the teeth.

Nerves and blood supply: Each tooth and periodontal ligament has a nerve supply and the teeth are sensitive to a wide variety of stimuli. The blood supply is necessary to maintain the vitality of the tooth.

Dental Shorthand

Dentists use a variety of numbering systems for tooth identification. Nowadays the F.D.I. (Federation Dentaire International) system is being increasingly adopted worldwide where the permanent teeth are given two numbers, the first number indicating the quadrant viz.

Upper right	=	1
Upper left	=	2
Lower left	=	3
Lower right	=	4

The second number indicates the tooth in each quadrant beginning at 1 for central incisors to 8 for wisdom teeth. The tooth notation for the 32 permanent teeth therefore is

Upper right	**Upper left**
1.8 1.7 1.6 1.5 1.4 1.3 1.2 1.1	2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8
4.8 4.7 4.6 4.5 4.4 4.3 4.2 4.1	3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8
Lower right	**Lower left**

With regard to the 20 deciduous teeth the quadrants are indicated as follows:

Upper right	=	5
Upper left	=	6
Lower left	=	7
Lower right	=	8

The tooth notation for the 20 deciduous teeth therefore is

Upper right					Upper left				
5.5	5.4	5.3	5.2	5.1	6.1	6.2	6.3	6.4	6.5
8.5	8.4	8.3	8.2	8.1	7.1	7.2	7.3	7.4	7.5
Lower right					Lower left				

The Importance of Primary Teeth

Parents sometimes wonder why there is growing importance being placed on keeping a toddler's primary teeth in good condition until they are replaced by their permanent successors. Many parents still feel that the primary teeth are not important because they are going to fall out anyway. Besides the obvious importance of healthy primary teeth for eating, appearance and speech, they are also essential for guiding permanent teeth, which develop underneath, into their correct positions. Early neglect or loss can result in a number of problems. If a child's primary molar tooth has to be extracted early due to severe tooth decay, then the guide for the permanent successor is lost. The space available for the permanent tooth can be reduced resulting in a crooked permanent tooth. The possible complications caused by crooked permanent teeth are enough motivation for most parents to take proper care of their child's first set of teeth.

Saliva

The teeth and oral tissues are constantly bathed in saliva. Saliva is secreted by the salivary glands. The production of saliva increases when food or drinks are consumed. It's presence is vital to the maintenance of healthy oral tissue. Saliva has many functions including the following:

Functions of Saliva

<u>Fluid/Lubricant:</u>

Coats mucosa and helps to protect against mechanical, thermal and chemical irritation. Assists smooth airflow, speech and swallowing.

<u>Ion Reservoir:</u>

Holds ions needed for maintenance of enamel near the tooth. Helps prevent decay.

<u>Buffer:</u>

Helps to neutralise plaque acids after eating, thus helps prevent decay.

<u>Cleansing:</u>

Clears food and aids swallowing.

<u>Antimicrobial actions</u>:

Anti-microbial mechanisms in saliva help control the bacteria in the mouth.

<u>Pellicle formation:</u>

Protective coating formed on enamel from salivary proteins.

<u>Taste:</u>

Saliva acts as a solvent thus allowing interaction of foodstuff with taste buds to facilitate taste.

Plaque

Dental plaque is a common causative factor for caries and periodontal disease.

Dental plaque is an almost colourless sticky bacterial film, which adheres to the tooth surface. It is not removed by rinsing with water.

The accumulation of dental plaque around the gum margin leads to the development of gingivitis in most people. The longer the plaque is left, the greater the risk of gingivitis. Gingivitis is characterised by inflamed, reddened gums which bleed easily during normal toothbrushing. Daily careful plaque removal is required to prevent gingivitis.

These teeth appear to be clean

After effective brushing

Plaque is also involved in causing dental decay. When foods containing sugars are eaten the bacteria in plaque break down the sugars and acid is produced (see page 12). This acid then dissolves the surface of the enamel under the plaque causing dental decay (caries). There are many factors which influence this process and these will be dealt with in Chapter 3.

Plaque is difficult to see and therefore can be difficult to remove. A special dye in the form of a ***disclosing tablet*** can be used to stain the plaque making it easier to see. These tablets are available in most chemists.

After using a disclosing tablet

Chapter 3
ORAL HEALTH AND DISEASE PREVENTION

The two main oral diseases are
- dental caries or dental decay and
- periodontal or gum disease.

There is now clear evidence that both of these diseases can be prevented or at least considerably reduced. Indeed, during the past 20 years there has been a substantial reduction in the prelavence of dental caries in Ireland. However, despite this improvement there are still large numbers of people who continue to suffer high levels of dental decay and gum disease. As well as caries and periodontal disease there are a number of other conditions which affect the oral structures including;

- Oral Cancer
- Halitosis (bad breath)
- Tooth wear
- Dry Mouth
- Tooth Sensitivity
- Cold sores
- Mouth Ulcers
- Fractured Incisors

The determinants of these conditions and the preventive strategies to control them willl be considered in this chapter.

RISK FACTORS AFFECTING BOTH GENERAL HEALTH AND ORAL HEALTH

There are a number of risk factors which are associated with both general health and oral health. For example tobacco smoking, which is the single most important cause of death and illness, is a major risk factor for cardiovascular disease and cancers including oral cancer; it is also an important risk factor in gum disease, people who smoke have poorer gum health. Another example is alcohol, excessive use of which is a major risk factor in mental illness. Consumption of alcohol, combined with smoking are major risk factors in the incidence of oral cancer. Poor nutrition is a common risk factor for cardiovascular, cancers & oral diseases.

Preventive Strategies

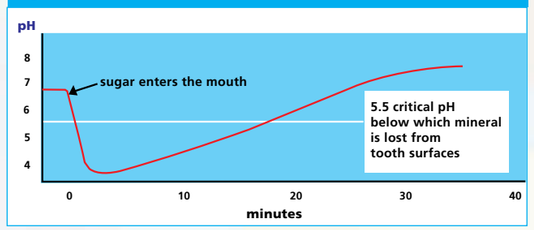
It is clear therefore that when considering strategies for the control of oral diseases,they should not be developed in isolation but as part of a ***"common risk factor approach"*** designed to control those risks common to a number of chronic diseases. For all health professionals and the wider community, the common risk factor approach is particularly efficient in health promotion (Sheiham 1992).

DENTAL CARIES OR DENTAL DECAY

Dental caries affects the tooth itself and its consequences are well known to most people particularly those aged 30 years or over. Most people growing up as children in Ireland in the '40s, '50s and '60s have experienced the blackened appearance of decayed teeth, toothache and "gumboils". Most would also have experienced the extraction of teeth, frequently under general anaesthetic. Caries begins with a small patch of demineralised (softened) enamel at the tooth surface, often hidden from sight in the fissures (grooves) or in between the teeth. The destruction spreads into the dentine (the softer, sensitive part of the tooth beneath the enamel). The weakened enamel then collapses to form a cavity and the tooth is progressively destroyed. Caries can also attack the roots of teeth should they become exposed by gum recession. This is more common in older adults.

Dental caries is caused by the action of acids on the enamel surface.

Stephan Curve, plotting pH within dental plaque against time.



The acid is produced when sugars, mainly sucrose in the diet either in foods or drinks, react with bacteria present in the plaque or soft film on the teeth. This reaction leads to a loss of calcium and phosphate from the enamel; this is called demineralisation. When it occurs frequently over many months there is a breakdown of the enamel surface leading to a cavity. Fluoride, when present in the mouth, slows down the process of demineralisation, particularly on non-biting surfaces of the teeth; fluoride is less effective on the biting or fissure surfaces.

Recently there has been some concern about possible damage to health from use of mercury amalgam material which is used to fill cavities caused by decay. In fact extensive research has shown that there is no link between the presence of amalgam fillings in the mouth and systemic disease. Alternative tooth coloured filling materials are currently being researched which may prove in the long-term to be viable alternatives to amalgam.

Prevention of Dental Caries

The prevention of dental caries can be approached in four ways
- Use fluorides
- Reduce frequent consumption of sugars
- Control plaque
- Seal fissures

Fluorides

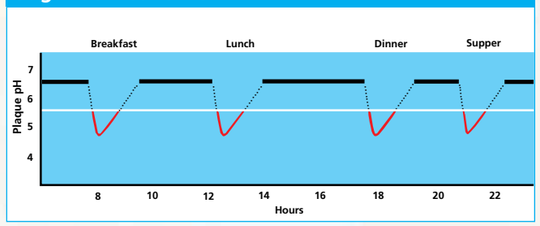
In Ireland 73 per cent of the population reside in communities served with water supplies which contain 1 part per million fluoride. This measure was introduced over 30 years ago and its beneficial effect is seen in the improvement of dental health of children and adults. In addition toothpastes containing fluoride now occupy over 95% of the toothpaste sales in this country and provide added benefit. Also sales of mouthrinses have increased considerably over the last 10 years and many of these contain fluoride.

Fluoride works mainly by slowing down the process whereby the enamel loses calcium and phosphate when exposed to acid following ingestion of food and drinks which contain sugars. It also helps to "heal" surfaces which show early signs of calcium or phosphate loss, such as an opaque appearance. Hence, most benefit is obtained if the level of fluoride is maintained at an elevated level in the mouth throughout the day. The main advantage of water fluoridation is that its caries reducing effects are available to everybody on the fluoridated water supply. Bottled drinking water contains highly variable amounts of fluoride depending on the source. Fluoride toothpastes are also an important source of fluoride and these should be used twice a day to maintain the level of fluoride in the mouth; fluoride mouthrinses are particularly useful for people who are prone to high levels of decay and also for people wearing orthodontic braces. Another alternative is a fortnightly fluoride mouthrinse - such mouthrinse programmes are used in a number of schools in non-fluoridated areas.

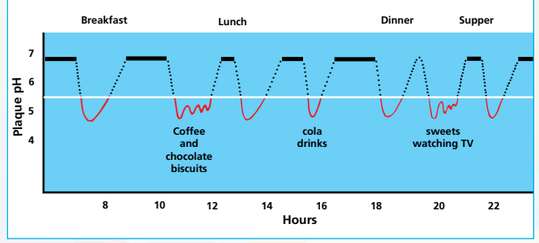
Reduce Frequent Consumption of Sugars

Dietary advice should be aimed at limiting the frequency of sugar intake. Food and drinks containing sugars should be recognised and their frequency of intake reduced especially between meals (see charts for details). Detailed advice on nutrition and oral health is given in Chapter 4.

Sugar at meal time



Sugar between meals



Control Plaque

Although caries cannot develop except in the presence of plaque, plaque removal by toothbrushing cannot alone be advocated for caries prevention.

Firstly normal brushing inevitably leaves some plaque in fissures and other stagnation sites where caries occurs, and secondly plaque rapidly begins to reform on cleaned tooth surfaces. Hence, while toothbrushing is important for maintaining gingival health, numerous studies have failed to establish a clear association between toothbrushing and caries incidence.

However, brushing with a fluoride toothpaste is the most important method of delivering fluoride to the tooth surface. Other suggested methods for plaque removal such as eating fibrous foods like apples and carrots have been shown to be ineffective.

Seal Fissures

A further way of helping to prevent dental caries is for a plastic film to be professionally applied to pit and fissure surfaces of teeth as soon as possible after they erupt into the mouth. This prevents access of plaque and plaque acids to the enamel surface. Numerous clinical trials have shown that sealants can be well retained and do prevent caries. However, they are only effective on the biting surfaces of teeth and should be seen as only one part of a comprehensive preventive plan.

When devising a strategy for the control of dental decay for an individual patient or for a community it is strongly recommended that a combination of the above strategies should be used taking into account the cost and effort required by the consumer.

PERIODONTAL DISEASE (GUM DISEASE)

Periodontal or gum disease is a pathological inflammatory condition of the gum and bone support (periodontal tissues) surrounding the teeth. It occurs in both chronic and acute forms. Acute periodontal disease is usually associated with specific infections, micro-organisms, or trauma. The chronic inflammation of the soft gum tissue surrounding the teeth is associated with the bacterial plaque which covers the teeth and gums. A very high proportion of all people living in Europe including Ireland have some inflammation of the gingival tissue at the necks of the teeth. This condition is termed gingivitis, which is characterised by redness of the gum margins, swelling and bleeding on brushing.

Child, aged nine, has poor oral hygiene, plaque around the gum margins causing inflammation

Periodontal Diseases

The 2 most common periodontal diseases are

- Gingivitis: inflammation of the gum at the necks of the teeth
- Periodontitis: Inflammation affecting the bone and tissues of the teeth.

Gingivitis was once seen as the first stage in a chronic degenerative process which resulted in the loss of both gums and bone tissue surrounding the teeth. However, this is no longer the case, as this condition can be reversed by effective oral hygiene practices on the part of the individual. No specific public health measure has been developed to prevent gingivitis other than the instruction of groups and individuals on how to remove the bacterial plaque from around the teeth and gums with a toothbrush and floss.

Healthy Gums: They should be pale pink in colour, have a matt surface and firm consistency, and their edges should be finely tapered. They should never bleed when probed by dentist or during routine tooth brushing, or flossing.

Oral Health and Disease Prevention

The net effect of the instructional programme given by health professionals and through commercial advertising and a general increase in the standard of living seems to have resulted in mouths being generally cleaner and showing less signs of inflammation.

When periodontal disease reaches the bone and supporting tissue it is termed periodontitis and is characterised by the formation of pockets or spaces between the tooth and gums. This may progress and cause chronic periodontal destruction leading to loosening or loss of teeth. The dynamic of the disease is such that the individual can experience episodes of rapid periodontal disease activity in a relatively short period of time followed by periods of remission.

Periodontitis

Nowadays we can expect severe periodontal disease to manifest itself in 5-10% of the population even though moderate disease affects the majority of adults.

The rate of progression of this disease process in an individual is dependent on:

(1) the virulence of the plaque and

(2) the efficiency of the local and systemic responses in the person (host).

Current research suggests that the host responses are influenced by specific environmental and genetic factors which can determine the susceptibility of the host generally to periodontal disease or the susceptibility of a particular site (tooth) within the mouth. In this regard, it is common for more severe forms of periodontal disease to present in individuals with compromised immune systems, e.g. in Diabetes, HIV infection, Leukaemia and Down's Syndrome. There is increasing evidence that smoking and stress cause an acceleration of the disease process and a particular virulent type of periodontal disease. Acute Necrotizing Ulcerative Gingivitis (Vincents infection) occurs almost exclusively in smokers.

Most Irish adults suffer from some form of periodontal disease. Only 23% of 16-24 year olds and 10% of 25-34 year olds had healthy gums in a recent survey of dental health.

As already stated, the vast majority of gum disease can be easily prevented by thorough plaque removal once a day. However, irregularities around the teeth will encourage the accumulation of plaque making tooth cleaning difficult. Such factors include overhanging edges on fillings and poorly contoured fillings and also some types of partial denture designs. Calculus (tartar) is plaque which has calcified and hardened and may cause plaque to accumulate more readily. For the majority of the population, however, periodontal disease can be effectively treated and maintained by professional care and proper oral hygiene practices on the part of the individual.

Prevention

The most important method of limiting periodontal disease is by plaque control directed to maintaining gingival health. This must be considered at two levels - what people can do for themselves by way of plaque control on a daily basis, and what dentists and hygienists can do to eliminate plaque retention factors and to advise the individual on the most appropriate home care.

Control plaque

The most important plaque control method is toothbrushing and it should be established as a daily routine from early childhood. Toothbrushing skills should be taught to people of all ages. The precise technique is less important than the result, which is that plaque is removed effectively and daily without causing damage to the teeth or gums.

Recommended Toothbrushing Technique

A gentle scrub technique is effective for most people and is easy to teach and readily accepted. Careful use of this method with a recommended type of brush should be encouraged, as it will provide effective plaque removal. Most authorities recommend a brush with a small head bearing densely packed soft to medium synthetic filaments. Daily effective toothbrushing may be associated with some gingival recession. However, slight recession is preferable to the diseases caused by plaque. Faulty toothbrushing techniques involving excessive pressure may considerably increase recession and loss of tooth substance by mechanical abrasion and must therefore be corrected.

Aids to Plaque Removal

- Plaque disclosing agents
- Dental Floss and other interdental cleaning aids
- Mouthrinses

Plaque disclosing agents which colour plaque to make it easily visible can be a useful aid to improving plaque control. They will not in themselves remove plaque, but will show areas where plaque remains after brushing. Dental floss and other interdental cleaning aids are of value if used correctly and they will usually require professional advice and instruction. An adjunctive method of plaque control is the use of antiseptics, of which chlorhexidine is the most effective. Although this antiseptic is on general sale in Ireland in mouthrinse and gel forms, its tendency to stain teeth and impair taste makes it generally unacceptable for long-term use. Toothpastes and mouthrinses containing other chemical agents, while less effective than chlorhexidine, do not have these side effects and are of some value to gingival health.

It is the responsibility of the dental clinician to ensure that any treatment provided minimises plaque retention; this is a part of treatment planning. Clear advice must be given on the need to clean bridges, dentures and orthodontic appliances (braces) effectively and regularly. Calculus can form on teeth both above gum level and within periodontal pockets and it will need careful scaling for its removal. The need for this should be made clear to the public. While appropriate professional treatment is important, the highest priority should be given to effective daily oral hygiene by the individual.

Prevention of Periodontal Disease

- The simplest toothbrushing method to recommend is the 'Scrub Technique'
- Regular meticulous removal of plaque at least once a day by toothbrushing.
- Regular visits to the dentist/hygienist (once a year)

ORAL CANCER

Excluding cancer of the lip, pharynx, salivary glands and dealing specifically with cancer within the oral cavity the annual mortality rate in Ireland from cancer of the mouth including cancers of the tongue, floor of mouth and soft and hard palates is estimated to be between 1 and 2 in 100,000 (Crowley 1995, Ormsby 1990, Mercer 1990]. Oral cancer incidence increases with age, for example in England and Wales the rates for cancer within the oral cavity rises from 0.1 per 100,000 in the 25 - 29 year-old group to 12.3 per 100,000 in those aged 85 years and older. The incidence of oral cancer is considerably higher in males than in females.

Both smoking and alcohol are important independent risk factors and there is now convincing evidence that their combined effect is greater than the sum of the risks associated with either. Also there is evidence of a dose response between tobacco smoking, the more one smokes the greater the risk of oral cancer.

Although oral cancer can occur without any pre-cancer signs, there are a number of well established pre-cancerous lesions also linked with smoking and alcohol consumption. Many of these have a whitish colour and may not be painful. While the number of these lesions such as leukoplakia which will become cancerous is extremely low, nevertheless a considerably higher proportion of people with these lesions develop oral cancer.

Leukoplakia

Prevention

The key to the prevention of oral cancer is not to smoke tobacco or give up smoking if already smoking and adopt a sensible approach to the consumption of alcohol. Early diagnosis has been clearly established as important for a successful outcome hence, regular dental check-ups, (once a year for adults) whether you have your own natural teeth or dentures are strongly advised.

HALITOSIS - BAD BREATH

Halitosis or bad breath or oral malodour is socially unacceptable but self-diagnosis is difficult, as it is not possible to easily detect an odour from ones' own breath. Those who have halitosis are often unaware of it and often may be informed by friends or relatives. Yet those people who have been told that they suffer from bad breath can continuously worry if an offensive smell can be detected from their breath. Halitosis is mainly caused by excessive amount of volatile sulphur compounds being produced by bacteria in the mouth. Studies have shown that up to 50 per cent of adults suffer from objectionable mouth odour in early morning before breakfast or toothbrushing . The reason for this is that saliva incubates bacteria in the mouth during sleep (reduced saliva flow). People with periodontal disease exhibit raised odour intensity due to incubation of saliva and micro-organisms in periodontal pockets.

Prevention

The plaque control and oral hygiene products aimed at controlling dental caries and periodontal disease will also help prevent halitosis. Also, treatment of periodontal disease in which periodontal pocketing is reduced will minimise halitosis. A number of systemic diseases and conditions such as diabetes mellitus, chronic renal failure and cirrhosis of the liver can give rise to particular bad odours.

There is increasing interest in the development of a reliable system that will measure the level of volatile sulphur compounds in one's breath. This technology is making rapid progress though the cost of a reliable system remains problematical.

Reduction of hatitosis is achieved in several ways. The amount of volatile sulphur compounds in the breath can vary greatly during the day in a single subject and is influenced by factors such as eating, drinking, oral hygiene and sleep and the effect these activities have on saliva flow and the washing of the oral cavity. The majority of studies done on *volatile sulphur compound*s concentrate on the effects which commercially available mouthwashes have on the reduction of halitosis. The reduction in mouth odour is caused by the anti-microbial influence of the mouthwash. Some products however, mask halitosis rather than dealing with the cause of the problem. Toothbrushing, eating, chewing gum and tongue brushing usually reduce the levels of oral halitoses to acceptable levels as well but the effect is not as long lasting as antimicrobial mouthwashes. There are now tongue cleaning devices which can be effective in controlling halitosis.

TOOTH WEAR

There is little information available on the prevalence of tooth wear. The amount of tooth wear seen nowadays is considerably greater than in the past due to the fact that more people are now retaining their natural teeth into old age.

Tooth wear is caused by three phenomena:
Erosion is the progressive loss of tooth substance by chemical dissolution not involving bacteria. Erosion of tooth surfaces is mostly the result of too frequent or inappropriate use of carbonated drinks and fruit juices with high levels of acidity. This habit would appear to be particularly common amongst teenagers and young adults. Erosion is also a problem in people who suffer from bulimia due to the reflux of gastric juices into the mouth.

Attrition is the progressive loss of hard tooth substances caused by mastication in grinding between opposing teeth. The extent of attrition will depend upon the use to which an individual puts their teeth. For example, it will increase in people who habitually use their teeth as a tool ("a third hand"). It will also tend to be more pronounced in people who eat a particularly fibrous diet.
Wear, due to attrition, can be considerably increased in people who habitually clench or grind their teeth for example during sleep (a condition known as Bruxism).

Abrasion is the progressive loss of hard tooth substances caused by mechanical factors other than mastication or tooth to tooth contacts. The most common cause of abrasion long-term is improper use of toothbrushing giving rise to notching at the junction of the crown and root of teeth.

Prevention

Reducing the frequency of taking carbonated drinks and fruit juices with high levels of acidity is the key to preventing erosion of teeth. Attrition is a slow progressing condition and many people will only be made aware of the damage to their teeth on visiting the dentist. In the case of bruxism, treatment may require the wearing of a bite guard during sleep. Abrasion can be reduced by adopting the correct toothbrushing technique, especially the avoidance of vigorous horizontal scrubbing action with a hard toothbrush.

DRY MOUTH

Dry mouth, or xerostomia is a result of reduced flow of saliva. There are many causes of dry mouth. Most people have experienced the temporary sensation of "drying up" when nervous, for example when giving one's first public speech. A side effect of many medications is reduced flow of saliva, e.g. those used to control high blood pressure, anti-parkinson drugs and anti-anxiety agents. Also some systemic diseases and conditions give rise to feelings of dry mouth. Up to 40% of elderly people complain of dry mouth.

The feeling of a dry mouth is a particularly uncomfortable one and often gives rise to difficulty in speaking and eating and can have a major negative impact on the quality of life. Reduced saliva flow can give rise to an increased incidence of dental decay, gum disease and also an increase in oral infection, such as ***candida albicans***. Following radiotherapy to treat cancer in the head and neck area, salivary flow can stop altogether either long term or for periods of up to three months. It is essential that people about to undergo such treatment have active management of their oral health to prevent the problems associated with dry mouth.

Management

People with dry mouth lose the protective effect of saliva in preventing dental caries and trauma to the oral mucosa. Management of the problem involves making the person comfortable by providing oral lubricants (saliva substitutes) and preventing disease through the use of fluoride mouthrinses and

mouthrinses to control plaque. People with dry mouth should be careful not to suck sweets regularly e.g. mints, boiled sweets. Although this may give temporary relief it will cause severe dental caries in the absence of saliva. Frequent consumption of drinks sweetened with sugar e.g. soft drinks, is also to be avoided.

Nowadays there are many saliva substitutes on the market, generally available through pharmacy outlets, which are highly effective in reducing the unpleasant side effects of reduced flow of saliva. There are now well defined methods for assessing the flow of saliva and it is important to seek the advice of a dentist as soon as the symptoms appear. (Edgar & O'Mullane 1996)

TOOTH SENSITIVITY

On eating, some people suffer sharp bouts of pain especially when they take cold food or drinks into their mouths. This condition, known as cervical dentine sensitivity, is a result of exposure of the root surface at the gum margin, often caused by gum disease or by over-vigorous toothbrushing with a hard toothbrush (getting "long in the tooth"). This condition is becoming more common since more and more people are retaining their natural teeth into middle and old age. The condition can be quite distressing.

Prevention

Precautions outlined above to prevent gum disease and also abrasion will also help reduce the incidence of cervical dentine sensitivity. In severe cases the advice of a dentist should be sought who may decide to place a protective filling over the sensitive site. It is also worth noting that sensitivity can also be due to other reasons such as a loose or cracked filling, another reason for seeking the advice of a dentist. Alternatively there are different preventive methods such as high concentration fluoride varnishes which can alleviate the sensitivity. The oral health care industry has responded to the increased prevalence of cervical dentine sensitivity and a number of "sensitivity" toothpastes are currently on the market. There is growing clinical evidence that these toothpastes can help alleviate the pain from cervical dentine sensitivity.

COLD SORES

A high proportion of infants and young children suffer from primary herpes virus infection of the lips and oral mucosa. Many of these infections are subclinical and the patient presents no symptoms. Such subclinical infections can lead to a resistance to future infection. However, the virus can remain latent in the lips and in later life can give rise to cold sores, a condition known as recurrent herpes. Such recurrences appear spontaneously or may be precipitated by trauma (e.g. accidental cut of lip when shaving), sunlight and menstruation. There is also a suggestion that stress can lead to these cold sores, though this has not been proven. Cold sores begin with a burning sensation on the affected area of the lips which is usually followed by the development of a painful blister (vesicles) which eventually become ulcers (pustules) and then heal gradually in 7-14 days. Cold sores are contagious and strict hygiene measures should be adopted when a family member is infected.

Prevention

Prevention is problematical though the use of sun barrier creams will help reduce attacks in those holidaying in the sun. Also a well established product on the market (contains 5% w/w acyclovir), if applied during the early burning phase, has been shown to be very effective in reducing the length of the blister stage and can get rid of the pustule stage.

MOUTH ULCERS

Many people suffer from recurrent ulcers in the mouth. These can be extremely painful. The most common form is called minor aphthous ulceration (MIAU). Teenagers are most frequently affected, though many experience their first lesions well outside this age range. Usually one to five small ulcers appear (less than 1mm in diameter) on the inside of lips or cheeks, floor of the mouth or tongue. The ulcers tend to be concentrated towards

the front of the mouth. Prior to the ulcers appearing, the patient may experience a burning or prickling sensation. The ulcers are painful, particularly if the tongue is involved and may make speaking and eating difficult. The course of these ulcers varies from a few days to a little over two weeks, but most commonly they last for about 10 days. Some minor trauma such as vigorous toothbrushing or an irregular filling can be precipitating factors. There is evidence also that abnormalities of the immune system are associated with aphthous ulceration. A more severe form called major aphthous ulceration (MJAU) can affect any part of the oral mucosa including the soft palate, tonsillor area and can extend into the oropharynx. The ulcers are larger than those seen in MIAU and last longer, up to periods of months in some cases. There are other forms of oral ulceration for example the ulceration may be part of a syndrome involving ulceration of the eyes, genitalia, the nervous systems & joints.

Mouth Ulcer

Prevention

Because the cause of these ulcers is not known prevention is difficult. It is important to seek the advice of a dentist who may decide to refer the more severe cases to a specialist in oral medicine for more thorough investigation. Maintenance of a high level of oral hygiene will reduce the likelihood of secondary infection when ulcers are present; this of course can prove difficult since patients may find toothbrushing too painful. Covering agents, some containing choline salicylate, are also available though they can be difficult to apply. They also may be difficult to keep in place, for example inside the lips and on the tongue due to constant movement. Use of antiseptics, for example chlorhexdine mouthwash, are reported to be helpful by some patients. Topical steroids can also provide relief. In some females there is complete remission from aphthous ulcers during pregnancy. Hence hormonal therapy has been tried with varied success. Local anaesthetic lozenges have been used as a last resort to give the patient some relief for example, when eating.

FRACTURE INCISORS

Primary incisors can be damaged especially when the baby is learning to walk. The most common injury sustained to baby teeth is that the tooth (usually one of the upper central incisors) is pushed up into the gum.

Approximately 1 in 12 children in Ireland will have broken one or more of their permanent teeth before they reach the age of 15 years. The most common teeth to be damaged are the upper central incisors. Damage can range from a small chip off the enamel, to a fracture involving the dental pulp. Occasionally also the tooth can be displaced or, more rarely, knocked out completely.

Prevention and Management

Due to the fact that these injuries occur following an accident during normal everyday activities, prevention is difficult. Wearing of mouthguards during organised contact sports will reduce the likelihood of fracturing a tooth. Also, children who have prominent upper incisors are more prone to damage, hence orthodontic correction is recommended. When a tooth is accidentally damaged it is important that professional advice from a dentist is sought immediately. In the case of permanent incisors which are knocked out of the mouth the tooth should be stored in milk. The patient should be brought to a dentist immediately; the chances of successful re-implantation are considerably better if the tooth is re-implanted within 30 minutes of being knocked out.

Key Points

- Frequent consumption of sugar containing foods and drinks is the most important cause of tooth decay.
- Recent Health Board Dental Health surveys report that 1 in 4 of five-year-olds and 1 in 3 of twelve-year-olds take sweet snacks between meals three or more times a day.
- The National Health & Lifestyle Surveys (Slán and HBSC) reported that over 40% of teenagers are consuming high fat and high sugar foods three or more times daily.
- Rising consumption of soft drinks is displacing milk in the diet of teenage girls which can lead to an increased risk of osteoporosis in later life.
- Poor nutrition is a 'shared common risk factor' for cardiovascular, cancer, and oral diseases..
- Diet and dental health should be promoted as part of general nutrition advice.

NUTRITION AND ORAL HEALTH

The single most important factor in relation to diet and dental caries is the frequency with which sugar-containing foods and drinks are consumed. The advice offered in relation to dental health should be based on reduction of between-meal snacking of sugary foods and drinks. The 1995 Food and Nutrition Policy guidelines recommend that frequent consumption throughout the day of foods containing sugar should be avoided especially by children. It further recommends that while a high energy intake is required for growth by adolescents (and this increases meal frequency), this should not be associated with frequent consumption of foods/drinks high in sugar throughout the day.

A Dental Health Study carried out by the Eastern Health Board in 1997 reported that 1 in 4 of five-year-olds and 1 in 3 of twelve-year-olds take sweet snacks between meals three or more times a day. Similar statistics were reported from the Mid-Western Health Board in it's 1997 report.

GETTING THE BALANCE RIGHT

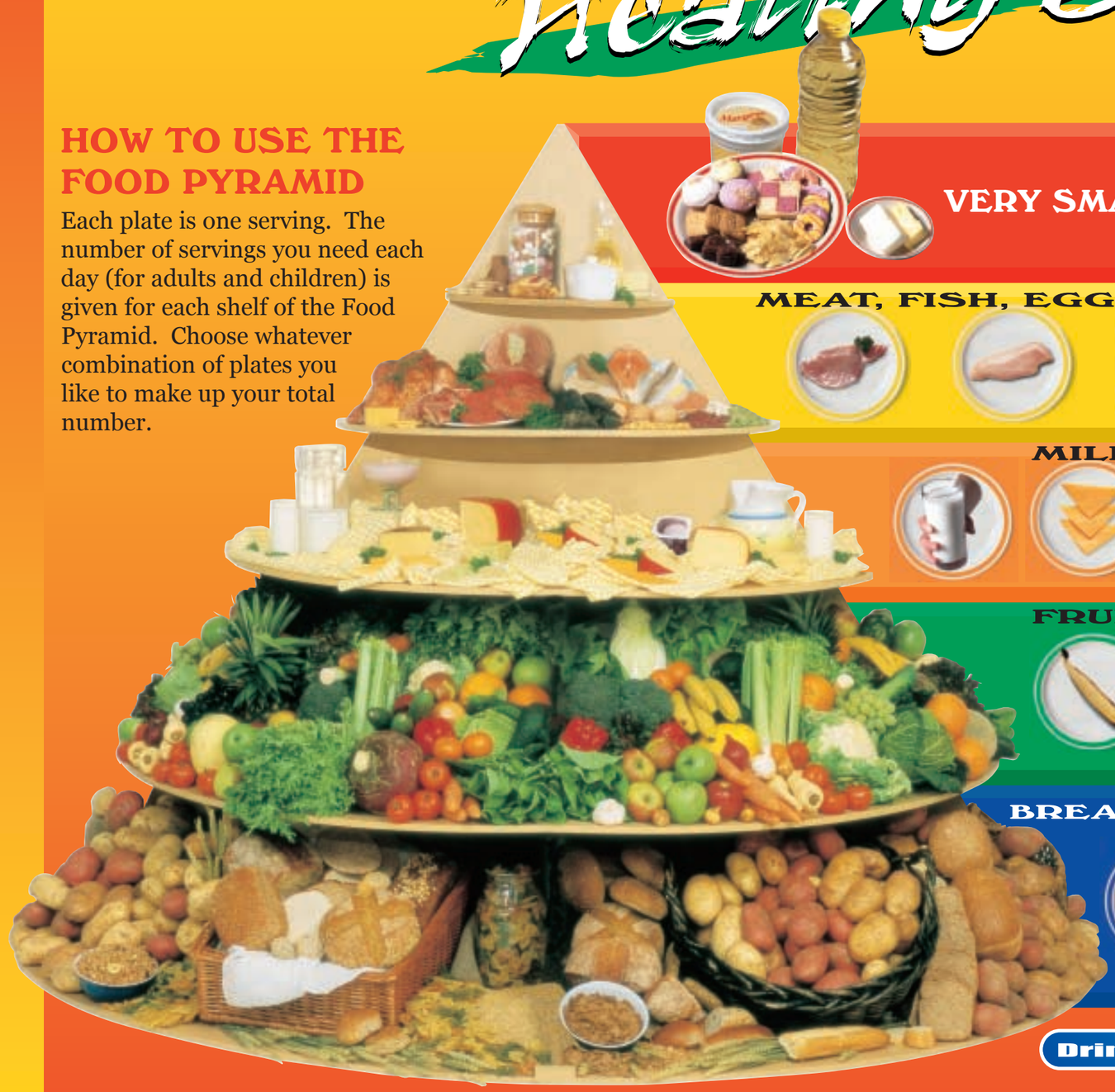
A variety of foods that provide important nutrients in the diet also contain sugars, (whether present naturally or added e.g. sweetened yoghurts, breads and cereals), but they do not present a threat to dental health and should not be avoided. However, the biggest threat to dental health comes from foods that have been allocated to the top shelf of the Food Pyramid, such as cakes, biscuits, chocolate sweets and fizzy drinks.

Go For Low Fat Healthy Eating

HEALTH PROMOTION UNIT
DEPARTMENT OF HEALTH AND CHILDREN

HOW TO USE THE FOOD PYRAMID

Each plate is one serving. The number of servings you need each day (for adults and children) is given for each shelf of the Food Pyramid. Choose whatever combination of plates you like to make up your total number.



VERY SMALL AMOUNTS

MEAT, FISH, EGGS, BEANS & PEAS

CHOOSE ANY 2
Choose 3 servings during pregnancy.

MILK, CHEESE & YOGURT

CHOOSE ANY 3
Choose at least 4 for teenagers and 5 servings if pregnant or breast feeding.
Choose low fat choices frequently.*
***Not suitable for young children.**

FRUIT & VEGETABLES

CHOOSE ANY 4
Choose green leafy vegetables regularly for essential Folic Acid.
Choose citrus fruits and fruit juices frequently.

BREAD, CEREALS & POTATOES

CHOOSE ANY 6+
Choose high fibre cereals and breads frequently.
If physical activity is high up to 12 servings may be necessary

Drink Water Regularly – At Least 8 Cups of Fluid Per Day

FOLIC ACID, AN ESSENTIAL INGREDIENT IN MAKING A BABY. YOU CAN GET FOLIC ACID FROM GREEN LEAFY VEGETABLES BUT IF THERE IS ANY POSSIBILITY THAT YOU COULD BECOME PREGNANT THEN YOU SHOULD BE TAKING A FOLIC ACID TABLET (400 MICROGRAMS PER DAY).

Good Food for all Stages of Life

DIETARY ADVICE FOR PARENTS/CARERS OF INFANTS

Breast milk provides the best source of nourishment for the early months of life. Mothers should be encouraged and supported in breast-feeding and may choose to continue to breast-feed as the weaning diet becomes increasingly varied.

Children have high energy needs for growth and development. It is important that children are given energy rich foods that are nutritious such as cereals, breads, dairy foods, and meats, chicken and eggs. Foods from the first four shelves of the food pyramid should be used to replace foods from the very top shelf that are high in added sugars/fats such as chocolate, cakes and sweets.

Practical tips:

Foods

- Do not add sugar to home prepared weaning foods
- Limit baby foods sweetened with added sugars

Drinks

- Suitable fluids include water (boiled and cooled for infants under 1 year). Natural mineral waters are not suitable for infants.
- Fruit juices should be unsweetened, well diluted (1 measure to 4 or 5 measures of water) and given at mealtimes from a cup. Baby juices and herbal drinks are not needed, but if given should be used sparingly, and only at mealtimes from a feeding cup.
- Colas, squashes, fizzy drinks and diet drinks are unsuitable for infants.
- Foods should never be added to the baby bottle.

BABY BOTTLE/NURSING DECAY

Parents/carers of infants should be warned particularly about the dangers of putting fruit juices or sugar-sweetened drinks into feeding bottles or reservoir feeders and giving these to the baby/toddler to hold, especially in bed. Such practices result in almost continuous bathing of the enamel with sugars and leads to severe and rapid tooth destruction, a condition described as baby bottle/nursing decay.

This condition is preventable!

A healthy mouth in a 3 year old child

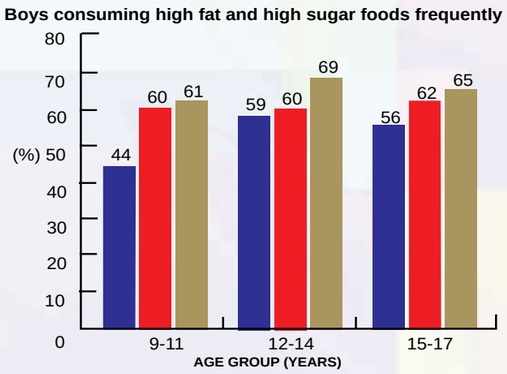
Nursing bottle mouth in a 3 year old

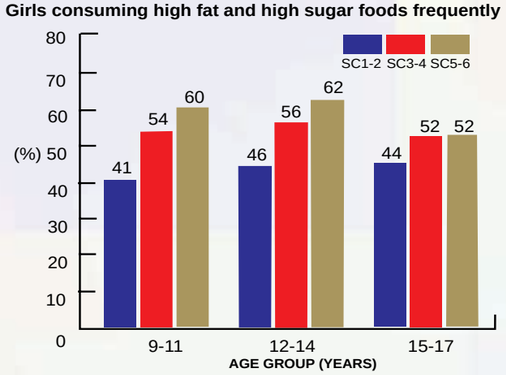
"Children should be fed and put to bed - NOT, put to bed and fed"

- ✔ DO make sure that your child does not sleep with a bottle in his or her mouth
- ✔ DO avoid all sugar-containing liquids in nap or bedtime bottle
- ✔ DO encourage drinking from a cup
- ✔ DO discontinue bottle feeding by your child's first birthday
- ✔ DO avoid dipping a soother in sugar, honey or anything sweet before giving to your child.

SCHOOL CHILDREN/ADOLESCENTS

Changes in eating habits due to relative independence from family influences and the influence of peers can result in changes in health behaviours and diet, specifically in relation to sugar. The 1999 National Health & Lifestyle Surveys report that children aged 9 -17 years were asked about eating a range of other foods, including cakes and pastries, soft (fizzy) drinks, sweets, chocolate and crisps. All of these are considered to be high fat and/or sugar foods and it is recommended that they are eaten sparingly.





The results show that over 40% of all age specific categories in males and females are eating these foods three or more times daily with those in the social class 5 - 6 being the highest consumers in both girls and boys.

Practical tips:

Foods

- Suggestions for between meal snacks are fruit, crisp raw vegetables, sandwiches, variety of breads, yoghurts, low fat cheese, plain popcorn and scones
- Cereals are excellent energy providers, but avoid the sugar-coated types

Drinks

- Milk, water, and sugar free squashes are suitable
- Diet drinks in moderation can be an alternative

Health implications of soft drinks

Rising consumption of soft drinks is causing concern according to recent research in the United States. Particular concern is highlighted about the long term effects of soft drinks displacing milk in the diet of teenage girls. If teenagers do not get enough dietary calcium in these vulnerable years they increase their risk of developing osteoporosis in later life.

Dental Health Implications

The frequent consumption of sugar containing fizzy drinks not only put teeth at risk to decay but can also cause erosion of the enamel. This is due to their acidic content (see page 18 for more details).

Fruit juices are an important source of vitamins in the diet. However, they should be taken **with meals** for two reasons. The frequent consumption of these can lead to enamel erosion and although pure juices may not contain sucrose they are rich in fructose and can also be cariogenic.

Adults and Older people,

Loss of natural teeth is associated with poor nutritional status in the elderly. Consumption of sugars seems to be higher in older adults than in younger adults. A tendency towards reduced salivary flow together with a higher sugar intake and increased gum recession, places the older person

with natural teeth at greater risk of dental caries (root caries) than younger adults. This population group tend to be frequent users of over the counter medicines, e.g. cough drops, laxatives, antacids and various tonics, which are generally high in sugar. The most important cause of dental erosion in adults is regurgitation and acidic drinks. Dietary advice for dental health for adults with natural teeth should be consistent with general health dietary guidelines.

Practical tips:

Foods

Elderly people should be encouraged to eat a variety of healthy foods as snacks from the food pyramid.

Drinks

The consumption of 8-10 cups of fluid a day is important for this age group.

Nutritional Advice and Oral Health

HEART HEALTH

One of the key issues in nutritional advice relating to good oral health is that the intake of sugar-containing foods should be limited, whereas for heart health it is recommended that fat intake should be reduced. However, research has shown that reducing both sugar intake and fat intake is difficult to achieve. As a result, it has been suggested that nutrition and heart health takes precedence over nutrition and oral health. Why? 'while dental caries is undesirable, heart disease is the main cause of morbidity'. However, in practice, suggested behaviour changes such as reducing the amount of fat spread on bread and having some jam or marmalade instead fits well with the dental health message.

There is no evidence for conflicting messages for the promotion of heart health at the expense of oral health or visa versa. Nutrition advice relating to both heart and oral health is clearly defined within the 1995 National Food and Nutrition Policy Guidelines for Ireland. These guidelines are further confirmed by the publication entitled 'Nutrition and Heart Health' (1996), a consensus statement by organisations in Ireland (including the Dental Health Foundation) concerned with Public Health.

FOOD AND DRINK LABELS

Health professionals need to raise peoples awareness of the nutritional claims on food labels that can be misleading, ambiguous or selective. Advice should also be provided to clients on how to read and interpret the sugar contents of products and be aware of the hidden forms of sugar.

The term "sugarless", "sugar free", "low sugar", and "no added sugar" may only mean that there is no added sucrose in a product. The product may already contain sugars that can be listed as, fructose, maltose, dextrose, glucose syrup, molasses, treacle, invert sugar, maltodextrins, maple syrup and honey - these can be cariogenic.

Nutrition information usually takes the form of a table which provides the amount of energy, protein, carbohydrate and fat per 100g of product and sometimes also per serving of pack. The information per serving is the most useful when comparing two foods. The sugar content of a product may be assessed by looking at the list of ingredients. The sooner sugar is mentioned on the list the more sugar there is in the product.

E.g. The following is the list of ingredients on a confectionery dessert label;

Ingredients: water, **fructose**, milk chocolate, inulin - vegetable fibre, skimmed milk powder, fat reduced cocoa powder, dried whey, gelatine, hydrogenated vetetable oil, **glucose syrup**.

Did you know that:

A carbonated drink (Cola) contains 35g of sugar per 330 ml can, 35g of sugar is equivalent to 7 teaspoons or 11 cubes of sugar.

Medicines

Pharmaceutical companies now produce sugar free medicines and doctors should be encouraged to prescribe them when appropriate.

- For those children allergic to cows milk, soy milk is used. Soy milk contains sugar and can cause caries if it is allowed to be used ad lib from a feeding bottle. Soy milk should be used as a "feed" and not a drink.

Chapter 5
ORAL HEALTH CARE PRODUCTS

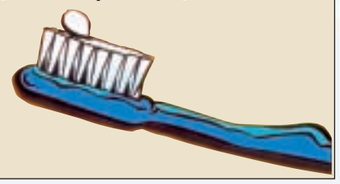
In most communities there is a wide variety of oral health care products available to consumers for over-the-counter (OTC) sale including;

Toothpastes
Toothbrushes
Mouthrinses
Interdental cleansers and accessories
Denture cleansers and fixatives
Saliva substitutes

Both toothpastes and mouthrinses contain therapeutic agents designed to control various diseases and conditions of the mouth such as dental decay, gum diseases, tartar and tooth sensitivity. Toothbrushes and the different interdental cleansers and accessories are primarily designed for the mechanical removal of plaque. There is still a sizeable market for denture cleansers and fixatives despite the fact that the number of people having teeth extracted has fallen considerably over the last 20 years. For many people, particularly those in the older age bracket, dry mouth is a problem hence, the increasing market for saliva substitutes.

What is in Toothpaste?
(Basic Ingredients)

- **Abrasives**
- **Detergent (1-2 per cent)**
- **Binding agents (1 per cent)**
- **Humectants (10-30 per cent)**
- **Flavouring, sweetening and colouring agents (1-5 per cent)**
- **Preservatives (0.05-0.5 per cent)**
- **Water**



Toothpastes are the most widely used oral health care product and there is considerable choice available to the consumer. Toothpaste types range from family anti-decay/anti-plaque types to the specific formulations for smokers, for sensitive teeth, special children's formulations and the recently introduced tooth whitening pastes which are the fastest growing sector of the toothpaste market. Toothpaste ingredients are usually shown on packs w/w' - that is weight for weight, or grams per 100 grams. Under new European cosmetics legislation, toothpastes are required to list all ingredients. In addition to water and therapeutic agents such as fluoride, antibacterial, desensitising and anti-tartar agents, toothpaste will normally contain the following basic ingredients:

• Abrasives

These cleaning and polishing agents account for about a third of toothpaste by weight. Most of the abrasives used are chalk or silica based. Examples are dicalcium phosphate, sodium metaphosphate, calcium carbonate, silica, zirconium silicate or calcium pyrophosphate. Abrasives differ; an international standard defines a test paste against which toothpaste abrasivity can be assessed, but there is no system for ensuring that all toothpastes sold in the Republic of Ireland are at or below this abrasivity level.

• Detergent (1-2 per cent)

This makes toothpaste foam, as well as helping to distribute it round the mouth to lower surface tension and loosen plaque and other debris from the tooth surface. Examples are Sodium Lauryl Sulphate and Sodium M Lauryl Sarcosinate

• Binding agents (1 per cent)

These agents prevent separation of solid and liquid ingredients during storage. These are usually derived from cellulose, sodium carboxy-methyl cellulose being the most commonly used. Carrageenans (seaweed derived), xantham gums and alginates are also used.

• Humectants (10-30 per cent)

These agents retain moisture and prevent the toothpaste hardening on exposure to air. Glycerol, sorbitol and propylene glycol are commonly used, glycerol and sorbitol also sweeten the toothpaste, though this is not their main function.

• Flavouring, sweetening and colouring agents (1-5 per cent)

Peppermint, spearmint, cinnamon, wintergreen and menthol are among many, flavourings used. Mucosal irritations from toothpaste are rare and are usually linked to flavourings or preservatives. They can take the form of ulceration, gingivitis, angular cheilitis or perioral dermatitis. Flavourless toothpastes are not available commercially so the only solution is to change brand. For people who react to mint, some children's formulations are mint free - for example homeopathic toothpastes tend to avoid mint because of interactions with other homeopathic remedies, but they may also leave out fluoride.

• Preservatives (0.05-0.5 per cent)

Alcohols, benzoates, formaldehyde and dichlorinated phenols are added to prevent bacterial growth on the organic binders and humectants.

Fluoride Toothpastes

Toothpaste containing fluoride make up for more than 95% of all toothpaste sales. It is well recognised that the decline in the prevalence of dental caries recorded in most industrialised countries in the past 20 years can be attributed mainly to the widespread use of toothpaste that contain fluoride. Investigations into the effectiveness of adding fluoride to toothpaste have been carried out since 1945 and cover a wide range of active ingredients in various abrasive formulations. Fluoride compounds and their combinations which have been tested for the control of dental decay include Sodium Fluoride, Stannous Fluoride, Sodium Monofluorophosphate and Amine Fluoride. The most widely used fluoride compounds in the Republic of Ireland are Sodium Fluoride and Sodium Monofluorophosphate.

Amount of fluoride in toothpaste

It can be difficult to work out the amount of fluoride contained in a toothpaste since toothpaste tubes often contain only the percentage of the fluoride compound in the paste. It is now accepted that the most efficient method of informing people of the amount of fluoride in a toothpaste is to give the "parts per million" fluoride (ppmF-). In the near future, following agreement between manufacturers, all toothpaste tubes will include details of ppmF- . In the meantime the following conversion table will help in working out levels of fluoride in toothpaste

Sodium Fluoride	0.32%	=	1500 ppm F-
	0.22%	=	1000 ppm F-
	0.11%	=	500 ppm F-
Sodium Monofluorphospate	1.14%	=	1500 ppm F-
	0.76%	=	1000 ppm F-
	0.38%	=	500 ppm F-

The EU has prohibited the marketing of cosmetic products (including toothpastes) with over the counter levels of fluoride greater than 1,500 ppmf-. It has been shown that toothpastes which contain more fluoride are more effective against dental decay. At present most toothpastes in Ireland contain 1000-1500 ppm.

Fluoride toothpaste for children

Recently there has been concern that because young infants and children could swallow some of the toothpaste when brushing, the use of fluoride toothpaste containing 1000 - 1500 ppmF- could give rise to enamel fluorosis of the front permanent incisors. This condition can vary from minor white spots to unsigllty yellow/brown discolouration of the enamel. While recent survey results in the Republic of Ireland show that these very slight changes do not affect appearance and are not a public health issue, nevertheless some manufacturers have begun

marketing low fluoride "childrens" or "paediatric" toothpastes containing less than 600 ppm fluoride; the effectiveness of these low fluoride toothpastes has not been established. There is no doubt that if too much fluoride is ingested during the development of the adult teeth then the enamel may be discoloured. Ingestion of excess fluoride during the first six years of life is likely to lead to discolouration of permanent incisor teeth. Hence, the following advice is now printed on many toothpastes that contain fluoride.

Under six years of age

1. Use toothpaste sparingly for children under 3 years of age.
2. Recommend a fluoride toothpaste - make sure only a smear or small pea sized (5mm) amount is placed on the brush.
3. Brushing should be supervised by the parent/guardian
4. A child should not be allowed to suck toothpaste from the tube
5. Brush at least twice a day to maximise the benefits of the paste

Highly flavoured toothpastes e.g. blackcurrent flavoured, which contain normal adult levels of fluoride are also available. ***These may be attractive for use by young children who should be specially supervised to avoid ingestion.***

For children over 6 years of age

1. There is now no danger of fluoride compromising the appearance of the front teeth hence, many families with older children buy just one type of toothpaste
2. Most fluoride toothpaste currently marketed are suitable, but some children prefer the blander taste of products produced specifically for the under twelves.
3. Brush at least twice a day to maximise the benefits of the paste

Toothpaste for adults

The majority of toothpastes combine the caries protection of fluoride with other agents to control plaque, tartar and gum disease. These can help individuals to improve their plaque control by the inclusion of antibacterial agents. Many include Triclosan and those with a product licence have been shown to offer a clinically useful improvement in gum health.

Other pastes specifically target 'tartar' and use phyrosphosphate to inhibit the calcification of dental plaque and hence the build-up of tartar (calculus).

The most recent approach has been the development of 'all in one' toothpaste containing a number of agents which reduce tartar formation, improve gum health and prevent dental caries. It is important to verify that these new toothpastes have been 'clinically proven' by seeking information from dental public health personnel with expertise in the field.

Smokers toothpaste

People who smoke often suffer stained teeth because of tar deposits. Toothpaste to remove these stains are quite abrasive and vigorous brushing may actually remove enamel causing 'abrasion cavities', particularly around the necks of the teeth.

Special toothpaste to combat hypersensitivity

One of the consequences of ageing is that gum margins may recede exposing the root surface of certain teeth which in some instances result in hypersensitivity and pain when, for example, eating an ice cream. Toothpaste specifically formulated for sensitive teeth can be effective.

Whitening toothpaste

These pastes are being promoted primarily on the basis of cosmetic benefit. The market for these pastes is likely to continue to rise due to the increased retention of natural teeth by the middle

aged and elderly, since enamel tends to loose its whiteness with age. One toothpaste uses fluoride and an enzyme system. Whitening toothpastes are not to be confused with hydrogen (or carbamide) peroxide whitening systems made for professional application in the dental surgery. Under current EU directives implemented in this country via the European Communities (Cosmetic Products) Regulations 1997 (S.I. No. 87 of 1978) bans the use of tooth whitening products either by dentists or by the general public, if the concentration of hydrogen peroxide present or released in those products is higher than 0.1%. In the US toothpaste can include hydrogen peroxide but there is so far little trial support for their effectiveness.

Natural toothpaste

There is a range of 'natural' products available such as toothpaste containing essential oil of ginger, seaweed extract, propolis and much else. They also come in a pack made from recycled paper. It is important to check to see if these contain fluoride. Another problem with some 'natural' toothpastes is that their abrasive agents are not powerful enough.

TOOTHBRUSHES

Manufacturers are producing an increased number of toothbrushes incorporating different designs for handles, heads and bristles. Currently the dental profession recommend the following: for children a small toothbrush head approximately 20mm X 10mm seems most suitable; for adults it can be slightly larger, approximately 22-28mm x 10-13mm. Nylon filaments are recommended because of their better physical properties and standardisation, with a diameter of 0.15 - 0.20mm to give a soft to medium texture. Multi-tufted brushes are best. The frequency with which toothbrushes are replaced has yet to be correlated with dental health. ***The most helpful guide is to replace a toothbrush when the bristles begin to show signs of wear.*** Toothbrush handles can also be adapted to improve the grip by the user. Electrical or battery operated toothbrushes are useful for people who have difficulty holding and manoeuvring an ordinary toothbrush such as physically disadvantaged persons. In general however, there is no evidence that these toothbrushes are more effective than conventional brushes.

Toothbrushing

- Toothpastes containing fluoride are highly effective against dental decay
- For greater benefit brush twice a day
- Children under 6 years should be supervised when brushing their teeth and should only use a smear of toothpaste or pea sized amount.
- Toothbrushes should be replaced when bristles show signs of wear.

MOUTHRINSES

Over the past 10 years there has been a dramatic increase in over the counter sales of mouthrinses. In particular teenagers and young adults are purchasing these products and these are now becoming part of the normal grooming process of youth. From a health promotion point of view this is a welcome trend since most of the mouthrinses sold contain therapeutic agents to control various oral health conditions such as caries, plaque/gingivitis and halitosis.

Mouthrinses

- Mouthrinses containing fluoride are very effective in control of dental caries and are especially useful for those wearing orthodontic bands.
- Mouthrinses are also available for the control of gingivitis and the sales of these mouthrinses have increased
- Many people use mouthrinses to freshen their breath.

Rinses containing fluoride to control dental caries

Fluoride mouthrinses have been used for many decades for the control of dental caries. Initially these

were used mainly as public health programmes such as daily, weekly or fortnightly mouthrinsing programmes using 0.05% or 0.2% Sodium Fluoride. Over the last 10 years OTC sales of mouthrinses containing fluoride (usually 0.05% NaF) have increased. This is a welcome development since a high proportion of sales are to teenagers and young adult groups which are becoming increasingly prone to dental caries.

Some school-based programmes continue in the Republic of Ireland. Indeed one of the longest running school based programmes in the world is conducted in non- fluoridated areas of Co. Waterford. The programme commenced in the late 60s. Rinsing with a 0.2% solution of NaF is supervised by public health nurses in national schools (2nd to 6th classes). Ongoing monitoring shows that the programme is effective in the control of dental caries. (Holland et al, 1995).

Rinses to Control Plaque and Gingivitis

For a number of people toothbrushing does not sufficiently control plaque and gingivitis, hence the use of mouthrinses specifically formulated for this purpose. The most effective rinses contain chlorhexidine. This type of rinse is generally recommended for people who have acute gum problems. Long term use, more than 3-4 weeks, is not advised because the teeth may develop a brownish stain. Should this happen however, a dentist will be able to remove the stain without too much difficulty. The modes of action and effectiveness of these products are continually being reviewed. The popular pre-and-post brush rinses, with co-polymer and triclosan and other products do control plaque and improve gum health. In general however, these are not as effective as chlorhexidine but they have the benefit of not staining the teeth.

There has been some concern expressed about the high level of alcohol in some mouthrinses, as high as 25% in some cases. Mouthrinses should be carefully stored out of the reach of children. Indeed, ideally the mouthrinses should have child resistant caps (CRCs).

INTERDENTAL CLEANSERS AND ACCESSORIES

Even the most efficient toothbrushing technique would not result in removal of all plaque deposits. Whilst mouthrinsing will help in further plaque control, use of dental floss and woodsticks are often recommended by dentists and dental hygienists. These are recommended especially for patients who have particular need such as those with extensive fillings, crowns or bridges or with particular periodontal problems. Floss and wood sticks should not be recommended for children as they may damage their gums by incorrect use.

Disclosing Tablets

It is important to encourage people to monitor the effectiveness of their plaque control practices. Disclosing tablets stain dental plaque which remains on teeth and hence, they are a simple way of highlighting deficiencies in brushing technique.

(see page 11)

Disclosed plaque

DENTURE CLEANSERS AND FIXATIVES

Many people used to think that once they lost all their natural teeth their worries were over. This is not the case. When teeth are extracted the bone that held them in the jaw resorbs, so that the bony support for dentures constantly changes. This is a problem particularly in the lower jaw where extensive bone loss can occur, making it very difficult for some people to control their lower denture. Hence, dentures should be checked every five years. As bone in the mouth constantly changes in shape, it is clear that individuals cannot expect a set of dentures to last for life. Some people may find denture fixatives helpful, but they are only a short term solution. The main constituents of fixatives are tragacanth gum which may cause constipation, and kanaya gum which can decalcify dental enamel. This in turn can be a major problem if the individual still has some natural teeth present. Denture repair kits and relining kits to make dentures fit more comfortably are not recommended. Temporary repair kits are sometimes useful to mend fractured dentures in an emergency, but broken dentures are best mended by the dental technician working in association with a dentist.

Dentures should be cleaned at least once a day with a non-abrasive paste and a soft toothbrush. A soft nail brush is a useful alternative for people whose manual dexterity is compromised.

Soaking the dentures once or twice a week in a **diluted** 2% sodium Hypochlorite Solution will help keep them really clean, but they must not be soaked in hot water. Disinfectants containing bleach should not be used on dentures with any metal components.

SALIVA SUBSTITUTES

One of the side effects of many drugs and a problem encountered by many older adults is xerostomia or dry mouth. Medical treatments such as radiotherapy can cause long term or even irreversible dry mouth. People with dry mouth can experience severe discomfort and considerable difficulty with eating and speaking. A useful way to help with the discomfort of this condition is to recommend one of the artificial saliva preparations. One example of a product range contains mouthrinse, toothpaste and saliva substitute for those with dry mouth. Saliva substitutes can be useful if used just before eating, at night if a person wakes because of dry mouth, or first thing in the morning. A remedy which has been recommended is to sip drinks regularly.

Some people get relief by keeping a bottle of water to hand to sip as required. This can be beneficial in the prevention of dental caries if fluoridated water is used.

If drinks containing sugar are used rampant caries will result. Some people squirt lemon juice into the mouth to stimulate saliva flow, but lemon juice is acidic and this can result in acid erosion and destruction of the teeth (for people without natural teeth this problem does not arise). In more mild cases regular use of non sugar chewing gum can give considerable relief by stimulating salivary flow.

Saliva Substitutes

- Dry mouth is a side effect of many drugs which can give rise to considerable discomfort.
- Various saliva substitutes are now available and can give considerable relief
- Non-sugar gum can also give relief.

Chapter 6
DENTAL SERVICES IN THE REPUBLIC OF IRELAND

The population of the Republic of Ireland is 3.6 million. By the end of 1998 the number of dentists registered in Ireland was 1,713 of whom it is estimated that 1550 are in active dentistry. The remainder are retired from dentistry or living outside of Ireland.

Dentists in Ireland are registered by the Dental Council of Ireland and work under its code of professional behaviour and dental ethics. There are 135 registered dental hygienists in Ireland, registered also by the Dental Council. Dental hygienists work under the supervision of a dentist who perscribes the treatment plan and is responsible for the treatment.

The other types of dental auxiliaries are:

- Dental Surgery Assistants (Dental Nurses) who assist the dentist at the chairside and around the surgery. All dentists employ one (or more) Dental Surgery Assistants. An increasing number of DSAs hold Certificates.
- Dental Health Educators give advice to individuals or groups on oral health care.
- Dental Technicians carry out laboratory work on the prescription of a dentist.

At present there is no register of Dental Nurses, Dental Health Educators or Dental Technicians.

The breakdown of the number of dentists working in different settings in Ireland is approximately:

General Practice	1100
Hospital	20
University	30
Public Dental Service	300
Others	100
Total	1,550

GENERAL HEALTH CARE IN IRELAND

Primary Care

Under the General Medical Service Scheme, about 33% of the population receive free primary care through their general medical practitioner (GP), together with necessary drugs and medicines. Entitlement to such services is dependent on possession of a medical card which is assessed on a means-tested basis and is administered by the health boards.

The remainder of the population (67%) must pay for medical practitioner services and also for prescribed drugs and medicines. Financial support schemes are available for the cost of prescribed drugs and medicines. Tax relief is also available for drug costs and fees paid to doctors.

Hospital Care

Hospital care is provided largely by health board public hospitals, public "voluntary" hospitals, joint board hospitals and a small number of private hospitals.

Persons with medical cards are entitled to all in-patient public hospital services in public wards including consultant services, and all out-patient public hospital services. Non-medical card holders are entitled, subject to certain charges, to all in-patient public hospital services, in public wards including consultant services and out-patient public hospital services including consultant services. Some routine services (including dental) are excluded from out-patient services. However, such treatment is provided to children who have been referred from a child health clinic or a school health examination.

Approximately 40% of the population are members of health insurance schemes which cover the cost of private in-patient and out-patient hospital treatment to varying degrees. The State provides some tax relief on these health insurance premiums.

ORAL HEALTHCARE IN IRELAND

Adults

Most general dental care for adults is provided by the 1,100 or so dentists in (private) general practice. Patients with no State entitlement, or who choose to do so, have their treatment carried out on a purely private basis at fees agreed between themselves and the dentist.

There are two state schemes which entitle adult patients to treatment by dentists in general practice.

Department of Social Community and Family Affairs Dental Treatment Benefit Scheme

Employees, who make Pay Related Social Insurance (PRSI) contributions, and their spouses are entitled to receive fully or partially subsidised dental care for a limited range of treatments. Examination and diagnosis, together with x-ray investigation, are free to the patient while the dentist reclaims the full (fixed) cost of these items from the Department of Social, Community and Family Affairs. For other standard treatments there is a set fee, of which the patient pays a specified portion (e.g. 30% for composite and amalgam fillings; 50% for dentures). For more expensive treatments such as endodontics and prolonged periodontal treatment, the Department of Social, Community & Family Affairs pays a set amount, while the patient pays the remainder of the fee agreed with the dentist.

Over 90% of dentists in general practice have contracts under this (DSW) scheme, and each year, approximately 39% of eligible adults receive care under the scheme.

DEPARTMENT OF HEALTH AND CHILDREN

Dental Treatment Services Scheme (DTSS)

The Dental Treatment Services Scheme, a dental treatment service for adult medical card holders was introduced in 1994. Under this Scheme routine dental treatment is being extended, on a phased basis, to all adults (persons aged 16 years and over) with medical cards. The full Scheme will be available to all eligible adults before the end of 1999. The service is delivered by 858 dental practitioners to approximately 900,000 eligible persons throughout the country.

An emergency service is available at the point of delivery and routine care is available on application to a health board. The range of treatment items available includes examination, x ray investigations, fillings, extractions, oral surgery, partial and full dentures, periodontal (gum) treatments and root fillings. Treatment is free to the patient and the dentist claims the full cost from the health board through the General Medical Services (Payments) Board.

Children and Special Needs Groups

Dental treatment for children and for special needs groups is provided directly by the health board dental services. Approximately 300 dentists, 30 hygienists and 450 dental nurses are employed by the health boards. Services are provided for pre-school children, national school children (5-12 years), post-primary children under 14 years and some in the 14-16 year old group. Children in national school are screened on a regular basis and provided with preventive and other necessary care as required.

Orthodontic treatment is provided on the basis of case severity. The health board dental service gives priority to special needs groups (e.g. patients with mental or physical handicap, those in long-term institutional care, the medically compromised, travellers, refugees, etc.)

Children who do not avail of the public dental service for either routine care or orthodontic treatment can

go to the private dental practitioners, paediatric dentists or private orthodontists for their treatment. In these cases, parents must pay the full cost of care at fees agreed with the practitioner. Tax relief may be available for fees associated with some types of specialist care.

"Specialist" Dental Services

There is currently no formal recognition or registration of dental "specialists". The Dental Council and the Department of Health and Children are in discussion about the establishment of a specialist register for dentistry. There is however de facto specialisation with many dentists with post-graduate training and qualifications limiting their practice to various specialities for example orthodontics, endodontics, periodontics and paediatric dentistry.

The Dental Hospitals in Dublin and Cork provide a range of referral specialist services, some on an outreach basis to other hospitals. A consultant paediatric dental service is provided at Our Lady's Hospital in Crumlin, Dublin and in University College Hospital in Cork.

Oral Health Care in Ireland

- Dental treatment for children and for special needs groups is provided directly by the 8 Health Boards and funded by the Department of Health and Children.
- Most adult dental treatment is provided by the dentists in private practice under 2 schemes.

  The Social Welfare Dental Treatment Benefit Scheme operated by the Department of Social, Community & Family Affairs.

  The Dental Treatment Services Scheme (DTSS) operated by the 8 Health Boards for medical card holders.

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Appendix I

Sources of Information

Oral Health Services Research Centre
University Dental School & Hospital
Wilton
Cork
Tel: 021-901210
Fax: 021-545391

Dental Health Foundation, Ireland
26, Harcourt Street
Dublin 2
Tel: 01-478 0466
Fax: 01-478 0475
www.dentalhealth.ie
(from July 1st 1999)

Dental Council of Ireland
57, Merrion Square
Dublin 2
Tel: 01-676 2226
Fax: 01-676 2076

Irish Dental Association
10, Richview Office Park
Clonskeagh Road
Dublin 14
Tel: 01-283 0496
Fax: 01-283 0515

Department of Health
and Children (including Health
Promotion Unit)
Hawkins House
Dublin 2
Tel: 01-635 4000
Fax: 01-635 4001

Royal College of Surgeons of Ireland
123, St. Stephens Green
Dublin 2
Tel: 01-478 0200
Fax: 01-475 6003

Post-Graduate Medical & Dental Board
Corrigan House
Fenian Street
Dublin
Tel: 01-676 3875
Fax: 01-676 5791

Department of Social, Community
and Family Affairs
Treatment Benefit Section
St. Oliver Plunkett Road
Letterkenny
Co. Donegal
Tel: Letterkenny: 074-25566
Dublin: 01-874 8444

School of Dental Science
University of Dublin
Trinity College
Dublin 2
Tel: 01-677 2941
Fax: 01-677 2694

Dublin Dental Hospital
Lincoln Place
Dublin 2
Tel: 01-612 7200
Fax: 01- 6711255

Cork University Dental
School and Hospital
Wilton
Cork
Tel: 021-545100
Fax: 021-545539

*Irish Dental Technicians Association
c/o Dental Hospital
Lincoln Place
Dublin 2

*Irish Dental Hygienists Association
c/o 16 Burlington Rd
Dublin 4

*Irish Association For
Dental Surgery Auxiliaries
c/o 18 Farmhill Park
Goatstown
Dublin

Correspondence in writing

8 Health Board Headquarters

Eastern Health Board,
Dr. Steven's Hospital
Dublin 8.
Tel: 01-6790700
Fax: 01-6790790

South Eastern Health Board,
Lacken,
Dublin Road,
Kilkenny.
Tel: 056-51702
Fax: 056-65270

Southern Health Board,
Wilton Road,
Cork.
Tel: 021-545011
Fax: 021-345638

Mid-Western Health Board,
Catherine Street,
Limerick.
Tel: 061-316655
Fax: 061-483350

Western Health Board,
Merlin Park,
Galway.
Tel: 091-751131
Fax: 091-752644

Midland Health Board,
Arden Road,
Tullamore,
Co. Offaly.
Tel: 0506-21868
Fax: 0506-51760

North-Western Health Board,
Manorhamilton,
Co. Leitrim.
Tel: 072-20400
Fax: 072-55123

North-Eastern Health Board,
Kells,
Co. Meath.
Tel: 046-40341
Fax: 046-41459

Appendix I (continued)

Community Nutrition Service

Dublin/Kildare/Wicklow
Health Promotion Department,
Eastern Health Board,
15 City Gate, St. Augustine Street,
Dublin 8.
Tel: 01-6707987/6707992

Sligo/Leitrim/Donegal
Health Promotion Service,
North Western Health Board,
Main Street, Ballyshannon,
Co. Donegal.
Tel: 072-52000

Meath/Louth/Cavan/Monaghan
North Eastern Health Board,
County Clinic,
Navan,
Co. Meath.
Tel: 046-21595

Laois/Offaly/Longford/Westmeath
Child and Family Centre,
Midland Health Board,
Petitswood, Mullingar,
Co. Westmeath.
Tel: 044-44877

Galway/Mayo/Roscommon
Western Health Board,
Community Care HQ,
Merlin Park Pegional Hospital,
Galway.
Tel: 091-751131

Carlow/Kilkenny/Waterford/
Wexford/S. Tipperary
Health Promotion Centre,
South Eastern Health Board,
Dean Street,
Kilkenny.
Tel: 056-61400

Limerick/N. Tipperary/Clare
Health Promotion Centre,
Mid-Western Health Board,
Parkview House,
Pery Street,
Limerick
Tel: 061-483215

Cork/Kerry
Health Promotion Department,
Southern Health Board,
Eye, Ear & Throat Hospital,
Western Road,
Cork.
Tel: 021-923480

Other Relevant Agencies

Irish Cancer Society,
5 Northumberland Road,
Dublin 4.
Tel: 01-6681855
Fax: 01-6681599

ASH Ireland,
Action on Smoking and Health,
5 Northumberland Road,
Dublin 4.
Tel: 01-6607044
Fax: 01-6607955

Irish Heart Foundation
4 Clyde Road,
Dublin 4.
Tel: 01-6685001
Fax: 01-6685896

Irish Nutrition and Dietetic
Institute,
Ashgrove House,
Kill Avenue,
Dun Laoghaire,
Co. Dublin.
Tel: 01-2804839
Fax: 01-2804299

Irish National Health Promoting
Hospitals
(H.P.H.) Network;
National Co-ordinating Centre,
c/o JCM Hospital,
Blanchardstown,
Dublin 15.
Tel: 01-8213844 ext. 5077
Fax: 01-8203563

Centre for Health Promotion
Studies
Department of Health Promotion,
University College,
Galway.
Tel: 091-524411 ext. 3186
Fax: 091-525700

Oral Health Services Research Centre (WHO Collaborating Centre)
National University of Ireland, Cork
and
The Dental Health Foundation, Ireland

DEPARTMENT OF HEALTH AND CHILDREN

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