

Oral Health and Nutrition Guidance for Professionals

June 2012

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Foreword

It is immensely satisfying when separate strands of policy development come together to improve oral health. The *Oral Health and Nutrition Guidance for Professionals* will underpin two Scottish Government policies relating to children and vulnerable older adults.

The *Equally Well Implementation Plan* (2008) tasked us to improve the oral health of older people. Additionally, in October 2011 we introduced Childsmile Practice which embedded the three key oral health messages in NHS dental practice, where dental teams will work with families of newborn children to improve dental registration and attendance, demonstrate effective toothbrushing techniques and provide practical advice on nutrition.

This guidance document, aimed at professionals, will provide an excellent resource to support the dental team in delivering the nutritional outcomes of our oral health improvement strategies.

I would like to thank each member of the working group for their time and expertise in bringing together such a useful guidance document. Additionally, I would like to thank NHS Health Scotland for its support in managing the development process.

Margie Taylor

Chief Dental Officer

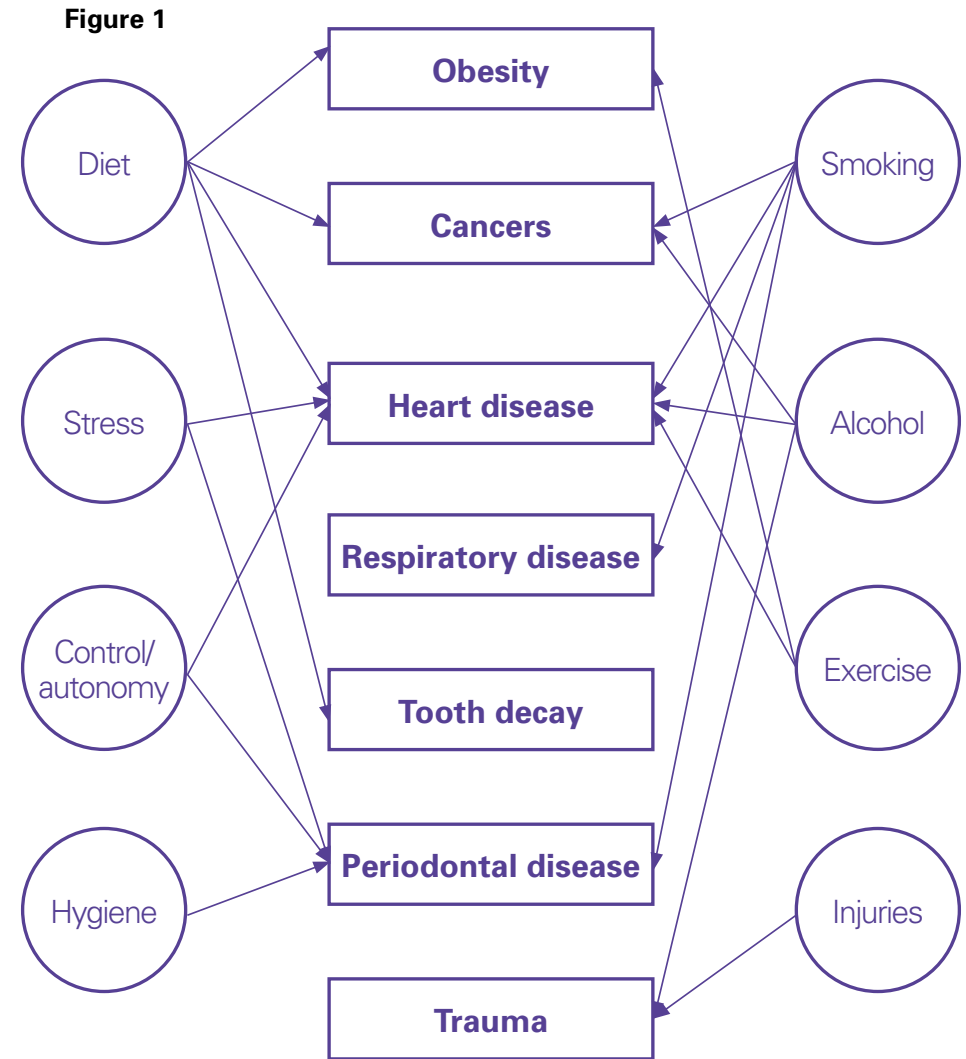
Introduction

The purpose of this guidance is to provide agreed, consistent, evidence-based guidance on oral health and nutrition for professionals. However, there are many factors involved that will influence both good oral and general health – oral health does not stand alone. This guidance uses a common risk factor approach to prevent diet-related diseases and recognises that common chronic diseases and conditions, such as tooth decay, periodontal diseases, obesity, heart disease, stroke, cancers and diabetes, share a set of common risk conditions and factors (see Figure 1).

This guidance focuses on improving the modifiable risk of diet, specifically in relation to the areas of conflict between oral health and nutrition messages, which are discussed in detail.

By adopting the common risk factor approach, oral health can be improved and diet-related diseases of the population tackled. The potential benefits of such an approach are far greater than isolated interventions. This approach is advocated in World Health Organization strategy in oral disease prevention at a global level.¹

The common risk factor approach



Adapted from Sheilham & Watt 2000²

What the guidance covers

The guidance provides clear oral health and nutrition advice for the whole population.

A special focus is given to the under-5s as intervention in the earliest years is vital for improved outcomes in the short and long term and will positively impact across the life course.^{3,4,5}

A focus is also given to nutritionally vulnerable older people as this group has specific nutritional and oral health needs, and are a priority group emphasised in recent government policy.^{4,6,7} There are other long-term diseases where further specialist advice would also be needed.

Between-meals snack and drink advice is also given and will be a useful reference to enable professionals to give practical, consistent advice to all age groups.

What the guidance does not cover

While the guidance takes a population approach, it is not clinical guidance, so does not address any medical conditions or individual nutritional and dental needs of particular groups, and these issues should be referred to the appropriate professional.

Who should use the guidance

The guidance is targeted at all members of the dental health team and at dietitians and nutritionists who provide oral health and nutrition advice to the public, which will enable them to use a consistent approach. This essential guidance is also intended for a wide range of health and social care professionals with varying levels of knowledge, and gives them easy access to the best available evidence. The guidance will assist health professionals from different disciplines to have a clearer understanding of the impact other health issues can have on their own work areas.

Why the guidance is needed

This guidance has been developed by an Oral Health and Nutrition Reference Group (see Appendix 8) in response to an *An Action Plan for Improving Oral Health and Modernising NHS Dental Services*⁸ that recommends:

‘The public require improved education on healthy eating with clear, consistent and achievable messages.’

‘Health professionals require to present a greater consistency of message and better joined-up approaches.’ (p. 20).

This guidance aims to fulfil this need. However, conflicts still exist between health messages and dietary advice provided by different healthcare professionals.⁹ There is uncertainty and confusion, and health professionals have requested the need for clear guidance on dietary advice for oral health to be in line with dietary advice for general health.¹⁰ These widespread conflicts have led to renewed calls for increased cooperation, consistency of messages and resource sharing among all health professionals.^{10,11,12} This is especially important in this current financial climate.

This guidance is intended to complement the preventative programmes and substantial work underway in NHS Health Boards and communities as a whole to improve oral health and nutrition and reduce health inequalities. Evidence over the last 30 years shows there has been an improvement in both child and adult oral health in Scotland. Nevertheless, tooth decay still remains a significant public health problem. The most up-to-date statistics report that 36% of Scottish P1 pupils show signs of obvious decay experience.¹³ Similarly two thirds of P7 children have no obvious sign of dental decay experience; but this means one third still do.¹⁴ Peak activity of tooth decay, therefore, occurs during childhood.

*The Early Years Framework*³ and *Improving Maternal and Infant Nutrition: A Framework for Action*⁵ show that very early childhood is a key opportunity to intervene and parents

play a crucial role in outcomes for children. Consistent guidance given to families and communities with young children is therefore essential.

Poor and unequal access to dental care contributes to dental health inequalities. Crucially, there are differences by regions and the majority of dental disease continues to be borne by individuals from more deprived backgrounds.^{13, 4}

Improvements in life expectancy also mean that there are new challenges to face in ensuring good oral health for older people, particularly for nutritionally vulnerable older people. This guidance supports the implementation of recommendation 55 of the *Equally Well Implementation Plan*⁴ that 'NHS Boards need to improve the oral health of vulnerable groups such as older people' (p. 52).

Improving the diets of parents, families and communities is a key government priority. Numerous expert studies and committees have concluded that a healthy balanced diet should be rich in fruit and vegetables and starchy foods, and should be low in fats, sugars and salt. This type of diet will help prevent obesity, cardiovascular disease, type 2 diabetes and certain cancers, and is also recommended for prevention of tooth decay and dental erosion.¹⁵ The poorest diets are consistently found in more deprived areas.¹⁶

*Preventing Overweight and Obesity in Scotland: A Route Map Towards Healthy Weight*¹⁷ demonstrates that Scotland has one of the highest levels of obesity in Organisation for Economic Co-operation and Development (OECD) countries, second only to the US, and this is predicted to worsen with adult levels reaching 40% by 2030. There is also a major focus on childhood obesity as around one-third of children are overweight or obese.¹⁶ Obesity poses a major risk to population health, and actions to tackle obesity have secondary benefits such as reducing tooth decay. This presents as a unique opportunity for NHS staff and partners to work in partnership with each other and with families and communities to achieve such 'double-benefits'.

The guidance is based firmly on current evidence and should be used in conjunction with and/or reference to these policies (see Appendix 1).

How the guidance should be used

It is our responsibility as professionals to select and offer advice that is most appropriate to the age and nutritional needs of individuals. This guidance aims to support us in that role.

We as professionals must also be sure we have the knowledge and skills to work with individuals to facilitate change as well as help them set realistic and achievable goals.¹⁸ Interventions to change health behaviour requires

that both the professional and individual work collaboratively – each bringing their own set of knowledge and skills to that collaboration. Working together to change what might be entrenched habits can be challenging. However, as professionals we have a responsibility to develop through training and practice, using our skills to help individuals facilitate change.

This document is for reference and can be used when tailoring behaviour change to the individual needs of the person at that time.

For more information see [Health Behaviour Change Competency Framework](#)¹⁹ or [Evidence-based top tips for helping people change behaviour](#).²⁰

Diet and nutrition advice

The Scottish population consumes too few fruit and vegetables, fish and starchy carbohydrates, and conversely eats too many foods high in fats, sugars and salt.²¹ The dietary imbalance increases the risk of developing chronic diseases such as obesity, heart disease, certain cancers and type 2 diabetes, as well as tooth decay.

The eatwell plate – getting the balance right

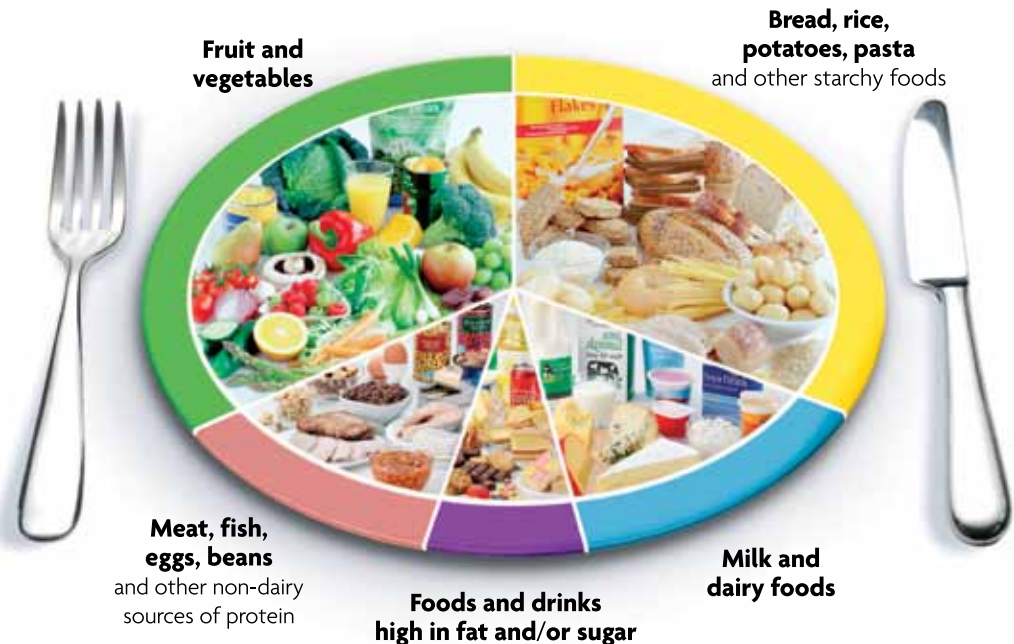
The eatwell plate illustrated makes healthy eating easier to understand by showing the types and proportions of foods required for a healthy diet.

The eatwell plate covers not just meals but snacks as well. It is not necessary to get the balance right at every meal, or even every day, but we should try to get it right over a week.

Figure 2

The eatwell plate

Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



Scottish Government recommendations for a healthy balanced diet can be achieved by choosing the following:

- Plenty of fruit and vegetables – at least five portions a day.
- Plenty of bread, rice, potatoes, pasta and other starchy foods
 - base meals on starchy foods
 - choose wholegrain varieties.
- Some milk and dairy foods
 - choose lower-fat varieties.
- Some meat, fish, eggs, beans and other non-dairy sources of protein
 - choose lower fat meat and meat products
 - include at least one portion of oily fish a week, e.g. salmon, mackerel, sardines.
- Just a small amount of foods high in fat and/or sugar (for sugary food and drinks these are best taken at mealtimes if at all).
- Fewer salty foods.
- Drink to quench thirst.

Scottish Dietary Targets can be accessed at the following website: **www.scotland.gov.uk/Publications/2008/06/20155902/4**

Table 1

Healthy eating advice should routinely be given to the public to promote good oral and general health. Current guidance is to reduce the amount of fat, saturated fat, salt and sugar in our diet, and to try to choose foods labelled:

low in sugar

low in salt (sodium)

low in fat

low in saturated fat

For specific dietary recommendations for infants and young children, see 'Eatwell ages and stages'

www.eatwellscotland.org/agesandstages/children/index.html

www.food.gov.uk/scotland

www.nhs.uk/livewell/loseweight/pages/keep-weight-off.aspx

Oral health and nutrition advice for children under the age of 5 can be found on p. 39.

Diet and tooth decay

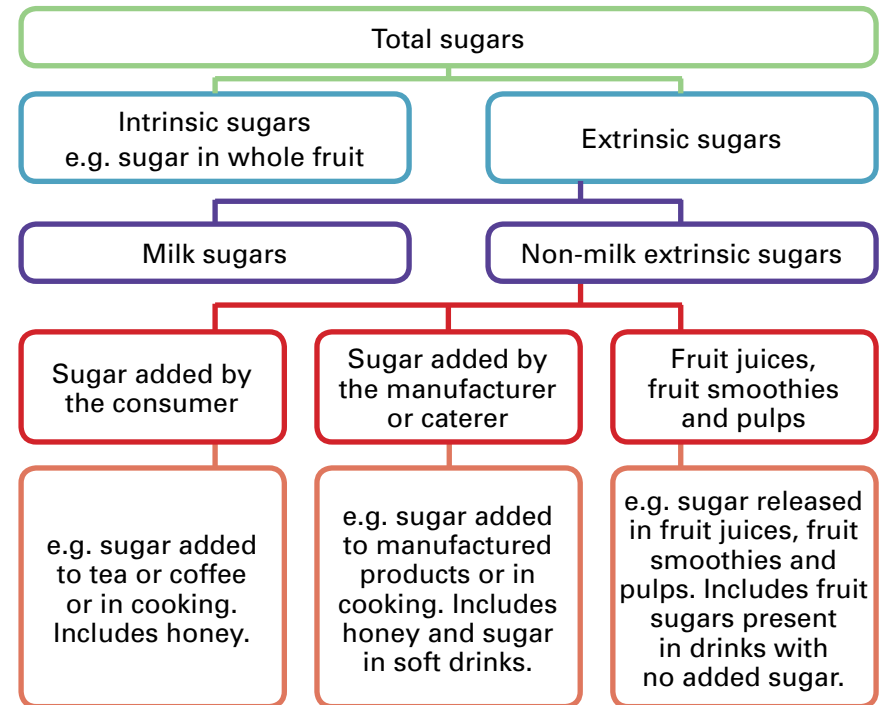
Sugars

Sugars are a type of soluble carbohydrate found in many foods and drinks. Sugars may be classified as either intrinsic or extrinsic sugars.

- **Intrinsic sugars** are those that occur naturally within the cellular structure of foods, for example sugars found in whole fruit. Intrinsic sugars are not thought to have adverse health effects.¹⁵
- **Extrinsic sugars** are those that are not incorporated within the cellular structure. Extrinsic sugars can occur naturally in food and drink, for example in honey or as lactose present in milk. Extrinsic sugars, with the exception of lactose in milk and milk products, are the prime contributors to tooth decay.¹⁵
- **Extrinsic sugars minus milk sugars** are referred to as non-milk extrinsic sugars (NMEs).¹⁵

Figure 3 shows the types of sugars and gives examples (in red) of how NMEs may occur in foods and drinks.

Figure 3



NMEs are sometimes referred to as 'free sugars' or 'added sugars'. For the purposes of this guidance the term NMEs will be used throughout. Refer to Table 3, p. 13.

Non-milk extrinsic sugars

NMEs are the cause of most tooth decay and a reduction in intake should be the focus when advising the public.

The latest *National Diet and Nutrition Survey*²² found the main sources of NMEs in adults and children are: soft drinks (including fresh fruit juice), cereals and cereal products, confectionery, preserves and sweet spreads. These drinks and foods should be the main focus when advising a reduction in NMEs, and should be replaced with fresh fruit, vegetables and starchy foods.²³

There is a particular concern about high levels of consumption of NMEs among pre-school children and adolescents.

Key recommendations to reduce the risk of tooth decay:

- **NMEs should not exceed 10% of total energy in the diet or 11% of total food energy, excluding alcohol in the diet.**^{15,24} In practice, this is a very small amount of sugar. Most of the sweetness from the diet should be from intrinsic sugars rather than NMEs.

- **Consume fewer NMEs.**^{15,24,25} Reducing NMEs can make a major contribution to the improvement of dental health as well as reducing calorie intake and helping to maintain a healthy balanced diet.
- **NMEs should be limited to a maximum of four times per day, including those taken at mealtimes.**^{24,11,10}
The scientific evidence states that frequency of sugar intake not exceeding four times a day is consistent with good dental health. This should be the recommended goal for the majority of the population. For those with a high sugar intake it may be necessary to negotiate an achievable and staged approach to this goal. Advice should be based on the needs of the individual and sought from a registered dietitian or health professional.
- **Remember fruit juice contains NMEs.**²⁶ Fruit juice should count only once as part of the five portions of fruit and vegetables to be eaten every day. Consume at mealtimes when it is safer for teeth.

Artificial sweeteners (not for the under-5s) can be recommended as a substitute for NMEs as they do not cause tooth decay and are lower in calories.

Table 2

Foods and drinks containing NMEs
Sugar and chocolate confectionery
Cakes and biscuits
Buns, pastries and fruit pies
Sponge puddings and other puddings
Dried fruits
Table sugar added to drinks and in food preparation
Sugared breakfast cereals
Jams, preserves, honey
Ice cream
Fruit in syrup
Fresh fruit juices and smoothies
Sugared soft drinks
Sugared, milk-based beverages
Sugar-containing alcoholic beverages

Checking the label

Fruit juices and dried fruit all contain a high concentration of sugars that can cause decay – these should be consumed at mealtimes only.

We can help individuals chose low-sugar foods by advising them to check food labels.

The nutrition information panel, usually found on the back of food packets, tells us whether a product is high, medium or low in fat, saturated fat, sugars and salt. For sugars, look for the '**Carbohydrates (of which sugars)**' figure. The figure may be given in grams of sugar per 100 g or by portion size, so it is important to remember that the amount eaten of a particular food affects the overall amount of sugars.

High sugar is more than 15 g sugars per 100 g of the food

Medium sugar is between 5 g and 15 g sugars per 100 g of the food

Low sugar is 5 g sugars or less per 100 g of the food

(NHS Choices, 2011)²⁷

Some foods have traffic light labels on the front of the pack. This means it is easy to see if the food has high, medium or low amounts of sugars in 100 g of the food (see p. 18).

The sugars figure given in a nutrition information panel is the amount of total sugars in the food. It includes sugars from fruit and milk as well as the sugars that have been added, i.e. NMEs, so it is vital to check food labels. The nearer the top of the ingredients list the item is then the higher in sugars it is.

Many processed foods and drinks can be higher in NMEs than might be expected, such as ready meals, tins of spaghetti, baked beans, cereal bars or breakfast cereals, so the importance of checking food labels must be reinforced.

Example of a nutritional food label on the back or side of packaging:

Ingredients

WHEAT FLOUR, **SUGAR**, **APPLE PUREE** (8%), VEGETABLE OIL, SKIMMED MILK POWDER, **BARLEY MALT**, DIETARY FIBRE (INSULIN), RAISING AGENTS, (AMMONIUM BICARBONATE, SODIUM PHOSPHATE, SODIUM BICARBONATE), CALCIUM CARBONATE, FLAVOURINGS. IRON FLUMARATE.

Nutritional Information

Typical Values	Per 100 g
Energy	1712 kj/406 kcal
Protein	10.0 g
Carbohydrate	69.6 g
of which sugars	20 g
Fat	9.7 g
of which saturates	(4.0 g)
Fibre	4.0 g
Sodium	0.18 g

This nutritional food label has a high sugar content as it has 20 g of sugar (as circled) per 100 g, more than 15 g sugar per 100 g of the food.

Remember that foods that state that they contain 'no added sugar' might still contain NMEs in the form of fruit or fruit juice concentrate, for example processed fruit bars.²⁸ Table 3 on the following page²⁷ lists common sources of NMEs that can be added to foods and drinks.

Table 3

Alternative names for sugar

beet sugar

brown sugar

cane sugar

corn sugar

corn sweetener

dextrose

fruit juice concentrate

fructose

glucose

glucose syrup

fructose glucose syrup

glucose fructose syrup

granulated sugar

high fructose corn syrup

high fructose glucose syrup

hydrolysed starch

invert sugar

invert sugar syrup

icing sugar syrup

isoglucose

levulose

maltose

molasses

sucrose

sucrose syrup

sugar

syrup

If one of these terms is near the top of the ingredients list then the product is high in sugar, as ingredients are listed in order.

The between-meals snack and drink section on p. 30 gives further advice on checking labels, and options for healthier snacks and drinks.

Oral health advice

The most common oral diseases are tooth decay and gum disease, with plaque linked to both these oral diseases. Gum disease is prevented by regular toothbrushing. Tooth decay can be reduced by regular use of fluoride toothpaste and a low-sugar diet.

Key oral health messages

Dental disease is not inevitable and can be prevented by changes in behaviour. Effective and evidence-based messages to prevent dental disease are included below and can be used in a 'step change' way if required.

Toothbrushing

- Brushing should start as soon as the first tooth erupts using a smear of fluoride toothpaste.
- Brush teeth twice a day – morning and especially at night.
- Children under 6 years should use at least 1000 ppm (parts per million) fluoride toothpaste (this is written on the toothpaste tube) and be assisted by an adult until at least 7 years old.
- Children over 7 and adults should use 1350–1500 ppm fluoride toothpaste.

- Children at increased risk of dental decay may need higher concentrations of fluoride – this should be discussed with a dentist.
- Spit out excess toothpaste and do not rinse with water, which will wash away the fluoride and reduce the benefits.

For more information on the Childsmile Programme, which is a national programme for improving children's oral health, see Appendix 2 or visit www.child-smile.org

Further information is available at www.sdcep.org.uk

Diet/sugar

- Reduce the amount and frequency of food and drink containing sugar.¹⁰ For more information see the Stephan Curve in Appendix 3.
- Sugary food and drinks should only be consumed at mealtimes, if at all, rather than between meals. Mealtimes stimulate saliva production, which may help prevent tooth decay).^{29,26}
- Avoid sugar-containing foods and drinks at bedtime. During sleep salivary flow is low, and with swallowing decline this makes clearance of sugars in the mouth less frequent. Toothbrushing is often forgotten after a bedtime snack or drink.^{10,24,23,30}
- Use sugar-free medicines wherever possible in order to limit damage – ask a pharmacist/GP or dentist. If sugar-free is not available, take with meals if instructions allow and visit the dentist regularly.²⁹
- Plain milk or tap water between meals are ideal drinks.^{29,26}

Dental visits

Visit the dental team as advised for regular check-ups.

Reducing sugar intake must be combined with the thorough and regular practice of toothbrushing with fluoride toothpaste.

Dental erosion

Research suggests that the prevalence of dental erosion in children and adolescents has increased in recent years.³¹ It has been suggested that there could be a link, identified among children and adolescents, between dental erosion and the increased consumption of acidic soft drinks, including carbonated drinks, fruit juices, diet drinks, sports drinks and alcopops.^{12,32}

Acidic foods and drinks that have the potential to cause dental erosion are identified in Table 4 below.^{12,33}

Table 4

Acidic foods and drinks with potential to cause tooth erosion
Fruit juices and fruit juice drinks
Soft drinks – carbonated and diluted squashes (including the 'diet' varieties and sport drinks)
Fruit teas
Wine, alcopops, cider and perry, spirits consumed with mixers
Vinegar, sauces and pickles (large quantities)*
Acidic sweets, e.g. acidic fruit drops

*See footnote in table p. 566 of Moynihan 2002¹²

How to reduce the erosive effect of acidic foods and drink:^{10,34,35}

- Acidic foods and drinks (e.g. fruit juice) should be consumed only at mealtimes rather than between meals and avoided at bedtime. Only one glass (150 ml) of fruit juice can count as a portion of the five-a-day target.
- Serve acidic drinks in a cup. They should not be sipped slowly or swished round the mouth as this increases contact time. If a straw is used, it should be placed behind the front teeth and well to the back of the mouth.
- Drink acidic drinks ice cold.
- Avoid brushing teeth for about an hour after consuming acidic drinks, since demineralisation of enamel occurs soon after drinking acidic drinks and makes the teeth more susceptible to abrasion.

While it is recognised that excessive consumption of acidic fresh fruits, such as citrus fruit and apples, may cause dental erosion if eaten in large quantities, the individual and population health benefits of fruit consumption far outweigh any oral health detriments from these foods.

Between-meals food and drink advice for adults and children

General advice about meals is covered in other documents. The focus here is on snacks, because it is the frequency of sugar intake between meals that has the detrimental effect on oral health.

It is important that the culture of snacking among individuals in Scotland is reduced in order to improve the overall nutritional quality of our diets and our oral health. In line with Food Standards Agency Scotland advice, we as professionals need to give positive dietary advice that support both oral and general health. See p. 10 for general recommendations. In addition the following points are important for consideration:

- Place greater emphasis on meals aiming to reduce snacking. However, you need to keep in mind that:
 - children under 5 need small snacks between meals due to their small stomach size and higher energy needs for growth (see under-5s section on p. 39).
 - children and young people need energy to grow and develop and keep them active so snack choices should be high in nutrients but low in sugar, fat and salt.

- Reduce the frequency and amount (portion size) of confectionery, savoury snacks and soft drinks consumed.
- Increase consumption of starchy foods and fruit and vegetables, and replace commonly consumed high fat/salt/sugar foods with more nutritious healthier foods.

Using the advice on the table overleaf and understanding food labels can help us give guidance on healthier snack choices.

Current guidance is to reduce the amount of fat, saturated fat, salt and sugar in our diet, and to try to choose foods labelled low in sugar, salt (or sodium) and both fat and saturated fat.

The labelling guide below can be used to check whether foods are high, medium or low in sugars, fats, saturates or salt per 100 g of food. When using the nutrition information on the back of most packs, remember the amount of food eaten may not be 100 g and may be different than the portion size that is sometimes suggested on the label.

Figure 4

Example of traffic light labelling showing levels


	Sugar	Fat	Saturated Fat	Salt
What is HIGH per 100 g	Over 15 g	Over 20 g	Over 5 g	Over 1.5 g
What is MEDIUM per 100 g	Between 5 g and 15 g	Between 3 g and 20 g	Between 1.5 g and 5 g	Between 0.3 g and 1.5 g
What is LOW per 100 g	5 g and below	3 g and below	1.5 g and below	0.3 g and below

Checking the ingredients list also gives an indication of the amount of sugar in a product. See the list of NMEs to look out for on p. 11, Table 2.

In the table starting on p. 19 there are food and drinks recommended as healthy snacks and that make ideal healthy choices. These are marked in a **blue bold** font.

There are also food and drinks that are recommended only for occasional use. These snacks and drinks are still nutritious but contain some sugar, fat or salt or may be acidic, which could contribute to dental erosion.

It is important to think carefully about these snacks and drinks, and to consider the balance of diet during the week.

In the following table, the icon  denotes 'Check the label – select products that are lower in fat, saturated fat, salt and sugar.'

Between-meals, food and drinks for adults and children over 5 years old

Snack advice by food group

Fruit and vegetables

Fruit and vegetables

Recommendations

A variety of fruit and vegetables can be recommended as a **healthy snack choice**.

Eat at least five portions of fruit and vegetables a day. Fruit- and vegetable-based snacks can make a significant contribution to achieving this recommendation.

This includes fresh, frozen, canned in fruit juice or natural juice (not syrup), and fresh/frozen/raw and tinned vegetables (not in salted water), e.g. raw carrots and tinned sweetcorn.

Potatoes don't count as a portion because they are a starchy food.

Why

Fruit, vegetables and salads are a good source of vitamins and minerals and other bioactive components (compounds helping to protect against ill health and disease).

They are a good source of fibre and are generally very low in fat.

It is also likely that eating lots of fruit and vegetables will reduce the risk of tooth decay, developing chronic diseases such as coronary heart disease, diabetes and some cancers.

Important: while it is recognised that excessive consumption of acidic fruits may cause dental erosion, the individual and population health benefits of fruit consumption outweighs any oral health risk.

Fruit juice and fruit smoothies

Recommendations

Pure unsweetened fruit juice and fruit smoothies are **not recommended** between meals.¹⁰

Fruit juice should not be given before 6 months. If given after 6 months it should be in small amounts (no more than half a cup), be unsweetened and diluted (**one part water to one part juice**) and given only at mealtimes in a free-flow cup, not a feeding bottle.²⁶

Only one glass (150 ml) of fruit juice can be counted as a portion of the five-a-day target and should only be taken at mealtimes.

Why

Frequent exposure to the sugars and acids present when fruit is juiced can lead to tooth decay and dental erosion.

Fruit juice and smoothies, when drunk in large volumes, can contribute a significant amount of calories to the diet.

For small children this reduces appetite for regular mealtimes, and for adults and children can contribute to obesity.

Dried fruit

Recommendations

Dried fruit **should not be recommended** between meals as a snack choice. Small portions of dried fruit can be included at mealtimes only.

Why

Dried fruit has a high concentration of sugars and therefore can cause tooth decay.

Small portions of dried fruit do contribute to achieving the five-a-day target.

Vegetable- and pulse-based soup

Recommendations

Vegetable and soups made from beans, peas, lentils (pulse-based soups) can be a **healthy snack choice**.

If soup is home-made, try to reduce the salt intake by using a low salt stock and using herbs and spices, rather than salt, to increase flavour.

A large number of dried and tinned soups are very high in salt and may contain NMEs. Some may have a low vegetable content, and should be avoided (e.g. cream soups).

Why

Soup is a good way of increasing vegetable and pulses intake and can be served with an accompaniment of wholegrain bread.

Those without sugar are not an oral health risk.

Baked beans

Recommendations

Beans on toast can be a **healthy snack choice**.

Why

Baked beans can count as one of the five-a-day target and are generally low in fat, high in fibre.

Only one portion of baked beans can count towards the five-a-day target.

Milk and dairy products

Milk and dairy products

Recommendations

Certain milk and dairy products can be recommended between meals.

Semi-skimmed, skimmed or other lower-fat milks (e.g. 1% milks are now available) are recommended for adults and children aged 5 plus as a **healthy snack choice**.

For children younger than 2, whole milk is recommended. Between the age of 2 and 5, children can gradually move from whole milk to semi-skimmed milk, as long as they are eating a good and varied diet.³⁶

A carton of semi-skimmed milk can be a convenient snack choice.

See section on under-5s on p. 39.

Why

These products are a good source of protein, vitamins and minerals.

The high levels of calcium and phosphate contained within milk will help to remineralise tooth enamel when it is exposed to sugary or acidic foods and drinks.¹⁰

However, some milk and dairy products are high in calories, fat, saturated fat, salt and NMEs, and may contribute to the risk of developing tooth decay, obesity and dietary-related chronic diseases.

Milk is a good source of protein, vitamins and minerals that contribute positively to the diet.

Plain milk is a safe drink for teeth between meals.^{10,26}

The high levels of calcium and phosphate in milk help to remineralise tooth enamel after it has been exposed to sugary or acidic substances (e.g. acidic flavourings).

A move from semi-skimmed to 1% is seen as an easy way for people to reduce saturated fat intake.

Soya, rice or oat drinks (enriched with calcium)

Recommendations

Soya, rice and oat drinks that are **low in fat** and **low in NMEs** can be recommended as an **occasional** snack choice.²⁸

Soya drinks (other than soya infant formula) are not suitable for infants. If children are given soya drinks, make sure the drinks are calcium fortified and given in cups.³⁷

Cow's milk substitutes such as oat milk, rice milk or almond milk are not suitable for children under 5.

Why

These drinks may be enriched with calcium and can serve as an alternative to cow's milk for individuals who do not like cow's milk or are allergic.

Nutrient content of soya drinks is not similar to infant formulas.

Soya drinks should be given in cups because of sugar content.

Oat, rice or almond milk drinks may be low in calcium and protein. These drinks may also have added sugars.

Flavoured milk drinks (including hot chocolate, cocoa, milkshakes and smoothies)

Recommendations

Flavoured milk drinks that are **low in fat** and low in added sugar or artificially sweetened can be recommended as an **occasional** snack choice.^{38,28}

Why

Flavoured milks and drinking yoghurts are a good source of protein, vitamins and minerals, especially calcium and phosphate.

Many of these drinks, however, contain a significant amount of NMEs, which can contribute to tooth decay.

Recommendations

Reduced fat cheeses may be taken **occasionally** as a snack. However, full-fat cheese is not recommended as a snack choice.

For children younger than 2, full-fat cheese is recommended as an **occasional** snack. Children between the ages of 2 and 5 years old can gradually move from full-fat to lower-fat cheese, as long as they are eating a good and varied diet.

Why

Cheese is a good source of protein, vitamins and minerals.

Cheese in particular has been found to stimulate salivary flow and raise calcium and phosphate levels to promote remineralisation.^{34,12} Nevertheless, cheese is often high in calories, fat, saturated fat and salt, and frequent consumption may contribute to the risk of developing obesity and dietary-related chronic diseases.

Important: all professionals should be advised that occasional use of cheese as a snack is recommended for greatest public health benefit and to avoid excess intake of fat. Cheese should not be recommended as a snack on a regular basis.

Yoghurt and fromage frais

Recommendations

Natural yoghurt/plain fromage frais does not have any NMEs and is the preferred type of yoghurt, in addition to yoghurts which are **low fat** and **low sugar** or **artificially sweetened** and can be recommended as an **occasional** snack choice.³⁸

The addition of either fresh or frozen fruit or fruit in natural juices to plain yoghurts/plain fromage frais is encouraged as a good way of increasing fruit consumption and of adding flavour.

Diet or low-calorie yoghurts are not suitable for use by babies or toddlers.

Flavoured yoghurts and fromage frais, including low-fat varieties are high in sugar and therefore should be confined to mealtimes only.

Yoghurts and fromage frais should not be sucked from a tube.

Why

Yoghurts are an excellent source of calcium, protein, vitamin A and small amounts of vitamin D (whole milk variety).

Yoghurts vary significantly in their nutritional composition and some are less healthy than others. Fruit flavoured yoghurts containing low amounts of NMEs are less harmful to teeth than yoghurts high in sugars and sticky sweet ingredients, e.g. chocolate, fudge and toffee.

Some yoghurts and fromage frais can be high in fat, saturated fat and sugar. Frequent consumption can increase the risk of developing tooth decay, obesity and dietary-related chronic diseases.

Low-energy diets may compromise young children's growth.

Sucking from a tube can be harmful to dental health as it increases contact with the teeth.¹¹

Drinks (non-dairy)

Water

Recommendations

Plain unflavoured water (tap, still or sparkling) is recommended as a **healthy drink choice** for dental and general health.

See further information for babies and young infants in the under-5s section (recommendation 7, p. 41).

Why

Plain water is the safest drink for teeth.

Plain water is calorie-free and helps to maintain hydration.

Fresh fruit juice

Recommendations

At mealtimes a small cup of pure unsweetened fruit juice – diluted 50:50 with water, or with a greater proportion of water to juice if a longer, more thirst-quenching drink is preferred.

Why

There is no firm evidence base for advocating a precise level of dilution. The risk of damage to teeth falls with increasing dilution, but so too does the nutritional benefit.

See p. 39 for advice for children under 5.

Sugar-free fruit squash, diet fizzy drinks, and unsweetened, sparkling fruit-flavoured water

Recommendations

May be recommended between meals only **occasionally** or as part of a staged approach to change.

They are not suitable for infants and young children.

Important: may be useful as a staged approach to change frequent drinking behaviour.

Why

Sugar-free/diet drinks are low in calories and are preferable to the sugary alternatives.

However, due to their acidic nature, they can contribute to dental erosion.

They can be high in artificial sweeteners and provide no nutritional value for infants and young children, often filling them up and leaving little room for more nutrient-rich food and drinks.

Sugary fizzy drink, fruit squashes/cordials, sport drinks

Recommendations

Not recommended between meals and only **occasionally** with meals.

Why

Due to their sugar content and acidic nature, they can contribute to tooth decay and dental erosion.

These drinks are often high in sugar, calories and may also increase the risk of obesity.

Tea and coffee (without sugar)

Recommendations

May be recommended (without sugar or syrup) between meals as a **healthy drink choice**.

Not recommended for young children.

Why

Tea/coffee can help to maintain hydration and poses no oral health risk (without sugar).

Tea and coffee may reduce the amount of iron absorbed from food so are not recommended for young children.

See p. 39 for advice for children under 5.

Confectionery, savoury snacks and high sugar/fat baked products (also see section for under-5s on page 39)

This food group includes: chocolate and chocolate products, sweets, chocolate-coated products and cereal bars, processed fruit sweets and bars, sugared or yoghurt-coated fruit or nuts*, cakes, biscuits, ice creams and ice lollies, tray bakes

Recommendations

Foods within this group are **not recommended** between meals as a healthy snack choice.

If eaten at all, these should be in small quantities at mealtimes only.

Why

Frequent consumption of these foods with their high sugar content is strongly linked to tooth decay.

Sugars consumed with main meals appear to be of less significance because they are cleared from the mouth by the high salivary flow rate generated by eating.¹⁰

Foods within this group are foods that are high in NMEs and/or fats and may contribute to the risk of developing tooth decay, obesity and dietary-related chronic diseases.

For further information on food allergies, including peanut allergy, see the Food Standards Agency website at www.eatwellscotland.org/healthissues/foodintolerance/index.html

*Advice on this has recently changed.

See p. 39 for advice for children under 5.

Artificially sweetened chocolate confectionery (e.g. diabetic products)

Recommendations

These are **not recommended** as a healthy snack choice.

Not recommended for children.

Why

Diabetic products are not recommended for individuals with diabetes or anyone else as they are unnecessary, expensive, may cause diarrhoea and offer no benefits over ordinary foods. Individuals with diabetes should receive appropriate, individualised nutritional advice conducive to good oral health from a registered dietitian.

The use of specialist products containing non-sucrose nutritive sweeteners, e.g. aspartame, saccharine, acesulfame-K and cyclamate, are not recommended for children as they may exceed the acceptable daily intake (ADI). These intense sweeteners are not permitted for use in food specially prepared for babies and young children.

See p. 39 for advice for children under 5.

Sugar-free confectionery (e.g. sugar-free lozenges, sugar-free mints)

Recommendations

These are **not recommended** as a healthy snack choice.
Not recommended for children.

Important: may be useful for some individuals as a substitute for sugar confectionery as a staged approach to change frequent behaviour.

Why

Sugar substitutes contained in these products can be associated with gastrointestinal disturbance and cause diarrhoea.

Sugar-free sweets may have a laxative effect (as they are often high in sorbitol). They are not necessarily a low-calorie option as they can be high in fat, calories or contain fructose.

For information on sugar-free chewing gum see Appendix 6.

Small, plain scones and pancakes/crumpets

Recommendations

Small portions may be recommended as an **occasional** snack choice.

Avoid high-fat or sugar toppings like jam and cream.

Why

Some of these foods can contain lower levels of fat and sugar.

Breadsticks, oatcakes, savoury scones, e.g. potato, cheese, soda 

Recommendations

Small portions may be recommended as an **occasional** snack choice.

Avoid adding high fat spreads, e.g. excess butter.

Why

Some of these foods can contain lower levels of fat and sugar.

Crisps and savoury snacks, dry and instant pot snacks 

Recommendations

These should only be recommended as an **occasional** snack choice.

Why

These foods are generally high in salt and many are high in fat and may contribute to the risk of developing obesity and dietary-related chronic diseases.

See p. 39 for advice for children under 5.

Nuts and seeds

Recommendations

Plain/unsweetened/unsalted/unflavoured may be recommended as an **occasional** snack choice.

When recommending, avoid dried fruit and nut mixtures, and avoid salted nuts and seeds.

Current advice is pregnant or breastfeeding mothers do not need to avoid peanuts or foods containing peanuts,³⁹ e.g. peanut butter, unless they are already allergic to them or a health professional advises against it.

If infants are introduced to solid food before 6 months they should not be given peanuts, other nuts (such as hazelnuts, almonds, walnuts), seeds, milk, eggs, wheat, fish, shellfish, or foods containing these ingredients until after 6 months of age. This is because these foods can sometimes trigger development of a food allergy. After 6 months it is advisable to introduce these foods one at a time in case there is an allergic reaction.

Whole peanuts or whole nuts should never be given to children under 5 because of the risk of choking.

Why

Nuts and seeds are good sources of unsaturated fats, protein, vitamins and minerals.

Dried fruit has a high concentration of sugars and therefore can cause dental decay.

Salt may contribute to the risk of cardiovascular disease.

Nuts and seeds are energy dense, which means that they contain a lot of calories and should only be eaten in small portions.

Not an oral health risk when consumed as an occasional snack.

Advice on peanut consumption has recently changed. For more information see <http://cot.food.gov.uk/cotstatements/cotstatementsyrs/cotstatements2008/cot200807peanut>

Meat and alternatives

Processed meat products and pies

Processed meat products, i.e. hot dogs, frankfurters, sausages, processed beef burgers, meatballs, haggis and shaped poultry products (e.g. nuggets), pastry-topped pies and other pastry products (e.g. bridies, sausage rolls, Cornish pasties, Scotch pies).

Recommendations

These are **not recommended** as snack choices.

Choosing lean meats to make burgers at home can be a lower-fat alternative.

Why

Processed meat products are mostly high in fats and salt.

These foods are higher in fat, salt and may contribute to obesity and dietary-related chronic diseases.

See p. 39 for advice for children under 5.

Starchy foods

Certain starchy foods can be recommended between meals. Lower fat, salt and sugar starchy foods are an integral part of a healthy diet and are not an oral health risk.

However, some are high in fats, salt and sugar, and some can increase the risk of developing obesity and dietary-related chronic diseases.

Bread

Recommendations

Plain bread is recommended as a **healthy snack choice**, (e.g. wholemeal, brown, granary, white, high-fibre and rye bread, pitta, chapatti, rolls, baguettes, bagels).

Ciabatta, focaccia, naan, tortillas, wheaten bread, olive bread and sun-dried tomato bread may be recommended as an occasional snack.

Bread products like garlic bread, butteries, croissants, pain au chocolate and brioche should **not be recommended** as snacks.

High sugar and/or high fat spreads** on bread are **not recommended** (including jam, marmalade, chocolate spread, honey, mayonnaise, salad cream, tomato ketchup, pickle).

Why

Bread is an important component of a healthy balanced diet and is not an oral health risk.

These foods may be slightly higher in fat and salt than plain bread.

These foods are higher in fat, salt and sugar and can increase the risk of developing obesity and dietary-related chronic diseases.

Sandwich fillings

Salad, fish, banana, lettuce, salad leaves, cucumber, tomatoes, carrot, pepper, sweetcorn, spring onion, oily fish fresh or canned in water, egg (**not** egg mayonnaise)

Recommendations

Sandwiches can be a **healthy snack choice**.

High-sugar and/or high-fat spreads** on sandwiches are not recommended (including jam, marmalade, chocolate spread, honey, mayonnaise, salad cream, tomato ketchup, pickle).

Why

This is dependent on individual energy requirements.

Some sandwich fillings are higher in fat, salt and sugar and may contribute to the risk of developing tooth decay, obesity and dietary-related chronic diseases.

Breakfast cereals

Recommendations

The consumption of wholegrain breakfast cereals that are low in salt and sugar and high in fibre may be encouraged as a **healthy snack**.

Breakfast cereals that are high in fat, salt and sugar are **not recommended** (check label).

The addition of table sugar to any cereal should be discouraged.

Why

Breakfast cereals are often fortified with a range of vitamins and minerals and are a useful way of increasing lower-fat milk intake.

Some breakfast cereals are high in fat, salt and sugar and may contribute to the risk of developing tooth decay, obesity and chronic diseases such as coronary heart disease, diabetes and some cancers.

** Fat spreads (butter and margarine) should be used sparingly and spread thinly. When using spreads, those which are low in total fat, low in saturates and high in monounsaturated/polyunsaturated fats (including rapeseed, olive oil, sunflower and soy-based margarines) are encouraged, whereas those spreads which are high in saturates and/or low in monounsaturated/polyunsaturated fats (e.g. butter) are discouraged.

See p. 39 for advice for children under 5.

Oral health and nutrition recommendations for specific groups

This section provides oral health and nutrition recommendations for two specific groups: the under-5s, and nutritionally vulnerable older people. These life stages have specific nutritional and oral health needs and are priority groups for prevention efforts.

The recommendations address continued areas of uncertainty and confusion from professionals, which are supported with a clear rationale. The recommendations are drawn from government policy, research literature or are a consensus of expert opinion and should form the basis of the advice given to these groups.

Under-5s

'Eating well is a long-term investment in health. Habits formed in childhood and adolescence are thought to track into adulthood influencing the risk of future chronic diseases.'

**Sir Harry Burns, Chief Medical Officer,
Scottish Government**

There is a compelling body of evidence that highlights the importance of investment in pre-birth and the earliest years of life.^{40,3,4,5} The types of foods and drinks consumed in pregnancy or given to infants is important for their health and wellbeing and establishing longer-term eating habits and the foundations for oral health. We know, however, that there still remains a number of nutritional and oral health challenges related to under-5s that national and local agencies are working hard to address. The contribution of health professionals to provide clear, consistent and achievable messages for oral health and nutrition is imperative.²⁵

Some of the main challenges in nutrition and oral health for under-5s:

- Low rates of breastfeeding and supplementation of breastfeeding with formula and other milks in the very early days. There are lower rates of breastfeeding in the most deprived areas.
- Inappropriate timing of weaning, i.e. before 6 months and poor choices of complementary (weaning or solid) foods.
- Diets high in foods and drinks containing sugar.
- Poor intake of fruit and vegetables.
- High rates of overweight and obese children.
- Low rates of dental registration in the under-2s.
- Poor oral health including high rates of tooth decay and dental erosion.
- Large numbers of preventable teeth extractions – 250,000 in 2005.
- Persisting oral and nutritional health inequalities.

For further information see *The Early Years Framework*.³

Advice for the under-5s

Early years	
Recommendations	Why
<p>1. Breastfeeding is the most natural way to feed infants. Exclusive breastfeeding (no other fluids, except vitamins, minerals, medicines) is recommended for the first 6 months of an infant’s life as it provides all the nutrients and fluids a baby needs.^{41,42,43,5}</p>	<p>There is compelling evidence on the health benefits of breastfeeding on short- and long-term health for both mothers and babies. Babies who are breast-fed are less likely to suffer from gastrointestinal, respiratory, urinary tract and ear infections, allergic disease (eczema, asthma, wheezing), type 2 diabetes and are less likely to be overweight later in childhood. Mothers who breastfeed are at lower risk of breast and ovarian cancer, and there is some evidence they are more likely to return to their pre-pregnancy weight.</p>
<p>2. It is essential that parents who choose to formula feed are shown how to prepare and use infant formula safely.</p>	<p>To minimise the risk of the infant becoming ill and risk of increased calories through too much formula. For more information see NHS Health Scotland leaflet <i>Formula feeding: How to feed your baby safely</i> (2011).</p>

<p>3. The recommended age for the introduction of complementary foods (weaning) is around 6 months for all infants.^{41,42,5}</p>	<p>Breast milk or infant formula provides all the nutrients babies require for around the first 6 months. At around 6 months and beyond, babies' requirement for nutrients, particularly iron, cannot be met by breast or formula milk alone. Most babies are developmentally ready for complementary foods (weaning) at around 6 months.</p> <p>Developmental signs of readiness for complementary feeding (or weaning) are they can sit up with support, control their heads and move food around their mouths. At this age babies' digestive and immune systems are more developed and they are more interested in food and want to chew.</p>
<p>4. It is recommended that breastfeeding should continue beyond the age of 6 months, alongside the introduction of appropriate types and amounts of solid foods, for up to 2 years or for as long as the mother chooses.^{42,5}</p>	<p>Duration of breastfeeding is important in terms of health gain for both mothers and babies.</p>
<p>5. An infant who is not breast-fed should receive whey-based (first) infant formula milk until the age of 1, alongside the introduction of complementary foods at around 6 months.³⁶</p>	<p>There is no medical or nutritional benefit to changing from whey to casein-based (second) infant formula. There are usually more problems in changing milks, than remaining on the same milk until the age of 1. For more information see NHS Health Scotland leaflet <i>Formula feeding: How to feed your baby safely</i> (2011).</p>

<p>6. Breast-fed babies do not need additional drinks.^{5,44}</p>	<p>Breast-fed babies do not need additional drinks as breast milk provides all the nutrients and hydration required. A thirsty baby will demand more breast milk.</p>
<p>7. Infants under 6 months who are formula fed may be given cooled, boiled tap water between feeds with nothing added. Do not use unboiled tap water. Still bottled water (not sparkling) can also be used but only if it has a sodium content (sometimes listed as Na) of less than 200 milligrams (mg) per litre. Bottled water needs to be boiled and cooled first. Beyond 6 months there is no need to boil water.³⁶</p>	<p>Formula-fed infants may become thirsty between feeds in very hot weather. Additional drinks of cooled boiled water can be given as long as these do not interfere with required intake of formula.</p> <p>Remember that any bottled water that is labelled 'natural mineral water' might contain too much sodium for babies. Check the label to make sure the figure for sodium is no higher than 200 milligrams (mg) a litre. 'Na' on the label also means sodium.</p> <p>For more information see NHS Health Scotland leaflet <i>Formula feeding: How to feed your baby safely</i> (2011).</p>
<p>8. Follow-on milk should not be given before 6 months and is not necessary at all for the majority of infants.^{45,46}</p>	<p>Follow-on milk has no advantage over standard whey-based infant formula, and is therefore not recommended. It should not be given to babies under 6 months as it poses additional risk to an infant's immature digestive system.</p> <p>For more information see NHS Health Scotland leaflet <i>Formula feeding: How to feed your baby safely</i> (2011).</p>

<p>9. 'Toddler' and 'Growing up' milks are not recommended. 'Hungry baby milks' or 'second milks' (casein-based formula milks) are available but should not be used unless a doctor or health visitor gives different advice.</p>	<p>'Toddler' and 'Growing up' milks have no nutritional advantage over full-fat cow's milk.</p> <p>For more information see NHS Health Scotland leaflet <i>Formula feeding: How to feed your baby safely</i> (2011).</p>
<p>10. No solids or sugars should be added to a feeding bottle – bottles should only be used for expressed breast milk, infant formula or cooled boiled water.^{36,26}</p>	<p>Giving solids in a bottle reduces the amount of milk and therefore nutrition that a baby receives. This could increase the risk of choking. Giving sugar in a bottle can also increase the risk of nursing bottle decay (rapid decay of baby teeth when front teeth are exposed to sugars for long periods of time) and risk of overweight/obesity.</p>
<p>11. Infants should not be put to bed with a feeding bottle or feeder cup.^{29,8}</p>	<p>Giving a feeding bottle at night increases the 'drip-feed effect' of frequency and duration of sugar in mouth and therefore poses a high risk in the development of nursing bottle decay. The development of decay is linked to the length of time sugar from juice or milk sits in the mouth.</p>

<p>12. Babies/infants should have their teeth brushed before going to bed and not have any milk or anything else to drink or eat after brushing.</p>	<p>Teeth should be brushed in the morning and last thing at night before bed with nothing to eat or drink after brushing at night. Less protective saliva flows at night and fluoride from toothpaste remains around the teeth longer giving added protection.</p> <p>For more information see www.sdcep.org.uk</p>
<p>13. Infants should be introduced to drinking from a non-valve, free-flowing cup from 6 months and the use of bottles should be discouraged from the age of 1.^{36,26}</p>	<p>Non-spill (valve) cups encourage babies to suck rather than sip and should be avoided. The sucking motion can directly lead to speech problems.</p>
<p>14. Dummies or comforters should not be dipped into sugars, e.g. honey or sugary drinks.¹¹ This introduction to sweetness at an early age can encourage a sweet tooth and the development of tooth decay.</p>	<p>If possible don't use a dummy and discourage thumb sucking – both can cause problems with how the teeth grow and develop.</p>
<p>15. Cup feeding is promoted for expressed breast milk for babies until breastfeeding is fully established.⁴⁷</p>	<p>Using a cup or spoon for expressed milk is advised to prevent nipple confusion. After breastfeeding is established, a bottle may be used.</p>

<p>16. Cow's milk (full-fat) is not a suitable drink for infants under 1 year; however, full-fat milk can be added in small amounts to complementary foods from 6 months.³⁶ The main source of milk should remain breast milk or formula, both of which are higher in iron.</p>	<p>Cow's milk is unsuitable as a primary source of milk for babies under the age of 1 due to its composition, and high sodium and low iron content.</p>
<p>17. Semi-skimmed milk is not a suitable drink for children under 2. Fully skimmed milk should not be given to children under 5 years old.³⁶</p>	<p>Semi-skimmed and skimmed milk lack essential calories and fat soluble vitamins required by children in this age range.</p>
<p>18. Soya-based infant formula should only be used under medical/dietetic/health visitor/public health nurse supervision.^{48,29,5}</p>	<p>There is controversy as to the safety of soya-based formula in the early months of life due to both its potential oestrogenic effect in the developing infant, and its allergenic potential in those infants at high risk of food hypersensitivity. The Department of Health does not advise the use of soya-based formula for infants under 6 months. Soya-based formulas contain sugars, which can cause tooth decay.</p>

19. Infant formula based on goat's milk is not suitable as a source of nutrition for babies under a year old.
www.eatwellscotland.org/healthissues/foodintolerance/foodintolerancetypes/milkallergy/index.html

Infant formulas based on goat's milk protein have not been approved for use by the European Food Safety Authority for babies under the age of 1. The European Food Safety Authority concluded in a review that the nutritional adequacy and safety of infant formula milk could not be determined with the available evidence. The evidence was not strong enough to conclude that babies fed goat's milk-based infant formula were less likely to suffer from allergic reactions than those fed cow's milk-based formula.

20. A small cup of pure, unsweetened fruit juice can be given from the age of 6 months at mealtimes, diluted 50:50 with water, or with a greater proportion of water to juice if a longer more thirst-quenching drink is preferred.²⁶

Diluted unsweetened fruit juice is a good source of vitamin C and is best given with breakfast or with a main meal to help with the absorption of iron. There is no firm evidence base for advocating a precise level of dilution. The risk of damage to teeth falls with increasing dilution, but so too does the nutritional benefit.

21. Encourage parents to make their own home-made weaning foods. No sugar or salt should be added.²⁶

Commercially produced baby foods can be high in sugar and salt. Sugar added to foods encourages a sweet tooth and can lead to tooth decay. Salt can overload a young baby's kidneys. The whole family can benefit from eating less salt and sugar. For more information see NHS Health Scotland's leaflet, *Fun First Foods*.

<p>22. Foods and drinks containing NMEs should be kept to a minimum and are best given at mealtimes.²⁹ Many foods and drinks that contain NMEs can lead to tooth decay and to a liking for sweeter foods, which may contribute to obesity.</p>	<p>Many foods and drinks that contain NMEs can lead to tooth decay and to a liking for sweeter foods, which may contribute to obesity. Foods containing NMEs also contain lots of calories, so reducing the amount and frequency of sugary food and drink intake can reduce tooth decay and could help control weight.</p> <p>Dried fruit has a high concentration of sugars and therefore can cause dental decay. Dried fruit is best taken at mealtimes, as salivary production is increased during mealtimes, which may help prevent decay. Small portions of dried fruit do contribute to achieving the five-a-day target; however, it should not be chosen as a between-meals snack.</p>
<p>23. For babies over 6 months, parents should be encouraged to provide only plain milk, breast or formula, and plain water to drink between meals.²⁹</p>	<p>Milk and water are good drink choices to encourage throughout the day as they have no erosive potential and help to prevent tooth decay. Use plain water as mineral, sweetened, flavoured or carbonated water can be too high in salt and minerals.</p>
<p>24. To help prevent tooth decay, snacks should be nutritious and free from salt or NMEs.</p>	<p>Excess salt can lead to kidney damage in immature kidneys and to high blood pressure and its consequent health problems, stroke and kidney damage in later life. NMEs can lead to tooth decay and to a liking for sweeter foods, which may contribute to obesity. Sugar contains no nutritional benefit.</p>

25. For children younger than 2, full-fat cheese is recommended only occasionally. Between the ages of 2 and 5, children can gradually move from full-fat to lower-fat cheese, as long as they are eating a good and varied diet.

Cheese is a good source of protein, vitamins and minerals.

Cheese in particular has been found to stimulate salivary flow and raise calcium and phosphate levels to promote remineralisation.^{34,12}

Cheese is often high in calories, fat, saturated fat and salt.

Frequent consumption may contribute to the risk of developing obesity and chronic diseases such as coronary heart disease, diabetes and some cancers.

26. Some families will be eligible to receive free vitamin supplements (A, C, D) through the Healthy Start scheme up to the age of 4 years. Suitable vitamin supplements can also be purchased over the counter.

To ensure infants and young children ensure normal growth and development and prevention of rickets (a bone disease). This is especially important for fussy eaters or those living in northern areas of the UK, where there might be fewer hours of bright sunshine, and those of Asian, African or Middle Eastern origin who cover up their skin. Further information on vitamin supplements for children via the Healthy Start scheme can be found at www.healthystart.nhs.uk.

For more information see NHS Health Scotland's leaflet, *Vitamin D and you*.

Nutritionally vulnerable older people

For the majority of older people that are nutritionally well, the oral health and nutrition advice described in previous sections applies.

Some older people, however, are nutritionally vulnerable.⁶ They can be nutritionally vulnerable if they:

- have unexplained or unintentional weight loss
- have physical difficulty eating and/or drinking
- have acute or chronic illness affecting appetite and food intake
- have cognitive or communication difficulties (such as dementia)
- require the texture of food or fluid to be modified.

The population structure of Scotland is changing, and future decades will see a projected increase in the population who are 65 and over. The biggest growth will be in the 'oldest old' (i.e. those over 80) – numbers will double from 200,000 to 400,000.⁴⁹ There is an increasing number of older adults retaining their own natural teeth compared to previous years. This is advantageous providing the teeth are maintained in a healthy state, as it will ensure that the ability to chew food is maintained, facilitating the consumption of a healthy and varied diet into old age.

There is also recognition of the important contribution a healthy mouth can have on overall health, quality of life, communication, self-esteem and appearance of the older person. However, the oral health of older people is an area that is often overlooked.

With increasing age and frailty, a myriad of factors can affect the nutrition, hydration and oral health of older people. These include:

- changes in the quality and quantity of saliva
- eating problems as a result of tooth loss or loose teeth
- drinking and swallowing problems
- reduced appetite
- reduced thirst recognition mechanism
- altered sense of taste and smell
- reduced manual dexterity
- impaired cognitive function, e.g. dementia
- bereavement or other emotional trauma and other social changes

- depression and/or anxiety, which are both more common in old age
- polypharmacy (the use of more than three medications at one time)
- poor nutritional factors, which increase the likelihood of more than one disease at a time
- poverty, which is a major factor and more likely to be experienced in old age.

Nutrition and oral health issues

Tooth decay: Tooth decay can still be a problem for older people, as a result of high sugar intake from foods and drinks, with root decay being a particular issue. This can be compounded by a dry mouth or wearing partial dentures.

Dry mouth: Dry mouth is associated with many prescribed medicines including antihypertensives and antidepressants, which are often prescribed for older people. Without the cleansing effects of saliva, tooth decay (especially root decay) and other oral health problems become more common. Older people suffering from dry mouth may try to increase saliva flow by eating sweets or taking frequent cups of tea or coffee. If these drinks contain sugar, they further increase the risk of tooth decay. Frequent drinks of water rather than sugary drinks or sweets should be encouraged.

For further information on the effects of specific medicines or to discuss an individual's dental problems, advice should be sought from a dentist.

Full dentures: Older people who wear full dentures on a high sugar diet will not get tooth decay but their dentures still need to be cleaned thoroughly once a day and rinsed after each meal. There is a myth that when older people lose weight their dentures don't fit. However there is no clinical evidence for this and it is more likely to be due to loss of muscle control.

Painful mouth: A painful mouth may be an indication of underlying infection. Urgent referral to a dentist should be sought. Where the mouth is dry, then water-based saliva replacement gels can be used. Specific advice should be obtained from a dentist. Dietary advice can be sought from a dietitian or nurse.

Sugar-free medicines: Older people tend to be frequent users of over-the-counter medicines such as cough sweets, laxatives, antacids and various tonics that are generally high in sugar and could cause decay. Sugar-free medicines are good for oral health and should be prescribed when available.

Diabetic products: Diabetic products are not recommended for older people with diabetes or anyone else as they are unnecessary, expensive, may cause diarrhoea and offer no benefits over ordinary foods. People with diabetes should receive appropriate, individualised nutritional advice conducive to good dental health from a registered dietitian.

Dehydration: This can have serious consequences for health and wellbeing and contributes to problems such as increased confusion, constipation, pressure sores and urine infections.⁵⁰ It is widely agreed that under-nutrition is a common problem in an ageing population (see below).

Under-nutrition: For the purpose of this guidance, the term 'under-nutrition' is used instead of malnutrition. In a recent survey conducted in 2010,⁵¹ it found that 34% of people admitted to hospital and 37% of people admitted to care homes were found to be at risk of under-nutrition.

The Scottish Government made a commitment to improve the quality of nutritional care provided in our hospitals⁵² and in 2003 NHS QIS published clinical standards *Food, Fluid and Nutritional Care in hospitals*.⁵³ The implementation of these standards was carried forward throughout Scotland by the NHS Improving Nutritional Care Programme.

*Food in Hospitals: National Catering and Nutrition Specification for Food and Fluid Provision in Hospitals in Scotland*⁶ was published by the Scottish Government to support NHS Boards in implementing the standards and ensure catering provision meets the needs of the nutritionally well and the nutritionally vulnerable patient.

The Scottish Government is also committed to improving nutritional care in care homes. The Scottish Government's *National Care Standards for Care Homes for Older People 2007*⁵⁴ include nutritional standards and the Care Inspectorate regulate care homes for the Scottish Government. Specific programmes to improve the nutritional care in care homes have also been implemented, such as *Promoting nutrition in care homes for older people*.⁵⁵

Nutrition and oral health advice

The advice in this section is for nutritionally vulnerable older people and reflects this vulnerable stage in the life course.

The messages for sugar differ to those provided in previous sections (see p. 19) targeted at the general population. Both the nutritionally vulnerable and the general population recommendations are given to show the apparent contradiction in the recommendation.

The risks of under-nutrition and dehydration for the nutritionally vulnerable are likely to have greater impact on their health than oral problems and therefore **nutritional recommendations take precedence over oral health messages.**

It is recognised that there are nutritionally vulnerable younger adults (e.g. those with a long-term chronic disease such as multiple sclerosis, motor neurone disease and stroke). The recommendations here may apply to this group; however, their particular needs are beyond the scope of this guidance and specific advice should be sought from a registered dietitian.

Nutritionally vulnerable older people recommendation	General population recommendation	Why the recommendation is different for nutritionally vulnerable older people
<p>1. Sugar: Where individuals need additional calories (energy), a higher frequency of NMEs intake may be appropriate. Any increase should be agreed with a health or social care professional or according to local policy.</p> <p>Enhanced oral hygiene measures should be used to limit possible tooth decay.</p>	<p>NMEs should not exceed 10% of total energy in the diet. In practice this is a very small amount of sugar. The frequency of NMEs should ideally not exceed four times daily, including sugars taken at mealtimes.</p>	<p>These individuals may need the provision of small, energy and nutrient-dense meals (a lot of calories in small amounts) with frequent snacks which will often include NMEs.</p> <p>The use of dairy products such as butter, custards and cream are alternatives for those requiring additional calories.</p>

<p>2. Drinks: Where individuals need additional calories (energy) or where individuals need to be encouraged to drink for hydration, frequent sugar-sweetened drinks may be required.</p> <p>Enhanced oral hygiene measures should be used to limit possible tooth decay.</p> <p>All fluids contribute to the recommended daily minimum of 1.5 litres of liquid (e.g. milk, soup, tea/coffee, soft drinks, fruit juice, milkshakes).</p>	<p>Sugary fizzy drinks, fruit squashes/cordials, sports drinks are not recommended between meals and only occasionally with meals.</p> <p>May be useful as a staged approach to change frequent drinking behaviour.</p>	<p>These individuals may have a reduced thirst mechanism or may be unable to consume a large volume at any one time so they will drink frequently. Individuals need drinks more often to prevent dehydration and meet individual nutritional needs.</p> <p>Drinks can be used to meet nutritional requirements, which will often include drinks with NMEs.</p>
<p>3. Artificial sweeteners: Where individuals need additional calories, artificial sweeteners are not appropriate.</p>	<p>Artificial sweeteners can be recommended as a substitute to NMEs as they do not cause tooth decay and are lower in calories.</p>	<p>These individuals should have NMEs instead of artificial sweeteners as they require additional calories (artificial sweeteners do not contain sugar or calories).</p>

Enhanced oral hygiene measures

For those nutritionally vulnerable older people on a high-sugar diet for nutritional purposes, oral hygiene measures should be enhanced to mitigate oral problems. These might include:

- Rinsing with water after sugary foods and drinks can help clear sugar from the mouth.⁵⁶
- Encourage additional toothbrushing at different times during the day in addition to normal brushing morning and night – fluoride in the mouth is the most important factor in preventing tooth decay.
- Ask the dentist to prescribe high-strength fluoride toothpaste (2800 ppm (parts per million)).
- Dentures should be removed and cleaned after each meal, and removed and rinsed after snacks.

For extra advice, contact the dentist or local oral health promotion team.

Oral health professionals can find further information in the NHS Health Scotland training pack, *Caring for Smiles*.⁵⁷

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Appendix 1:

Policy guidance and reports

This section provides information and links to the substantial evidence base used to develop this guidance in addition to the references provided in the previous section.

Oral health

An Action Plan for Improving Oral Health and Modernising NHS Dental Services Scottish Executive, 2005.

Childsmile Programme www.child-smile.org.uk

National dental inspection programme (NDIP) of Scotland 2010. NDIP, 2010.

Prevention and management of dental caries in children, dental clinical guidance Scottish Dental Clinical Effectiveness Programme, 2009.

Prevention and management of dental decay in the pre-school child. A national clinical guideline 83. Scottish Intercollegiate Guidance Network, 2005.

Preventing dental caries in children at high caries risk: targeted prevention of dental caries in the permanent teeth of 6–16 year olds presenting for dental care. A national clinical guideline 47. Scottish Intercollegiate Guidance Network, 2005.

Adult Dental Health Survey: oral health in the UK. Office of National Statistics. London: The Stationery Office, 1998.

Scottish Perspectives on NICE public health guidance 11: Improving the nutrition of pregnant and breastfeeding mothers and children in low-income households, NHS Health Scotland, 2009.

Nutrition

Improving Maternal and Infant Nutrition: A Framework for Action, Scottish Government 2011.

National Food and Drink Policy, Scottish Government, 2010.

Preventing Overweight and Obesity in Scotland: A Route Map towards a Healthy Weight, Scottish Government, 2009.

Healthy eating and active living: an action plan to improve diet, increase physical activity and tackle obesity.
Scottish Government, 2008.

Survey of Sugar Intake in Children in Scotland,
Food Standards Agency, 2008. NDSS 2008/2009.

Department of Health (DoH). Weaning and the weaning diet.
Report of Health and Social Subjects 45; 1994. London: HMSO.

Health inequalities

Equally Well Implementation Plan
(Scottish Government, 2008).

Early years

The Early Years Framework (Scottish Government, 2008).

Nutritionally vulnerable older people

Scottish Government (2010). *Older people living in the community – nutritional needs, barriers and interventions: a literature review*.

www.scotland.gov.uk/Resource/Doc/294929/0091270.pdf

Scottish Government (2008). *Food in Hospitals National Catering and Nutrition Specification for Food and Fluid Provision in Hospitals in Scotland*.

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Appendix 2: Childsmile Programme

Childsmile is a national programme, funded by the Scottish Government, designed to improve oral health and reduce inequalities in dental health and access to dental services. The main components of Childsmile are outlined in the table overleaf. Further information is available at **www.child-smile.org**

The Childsmile Programme is the vehicle for the delivery of the current oral health HEAT target that 'at least 60 per cent of 3- and 4-year-old children in each Scottish Index of Multiple Deprivation (SIMD) quintile to receive at least two applications of fluoride varnish (FV) per year by March/April 2014'.⁵

Childsmile component	Age	Content overview
Childsmile Practice	From birth to 16 years of age	<p>Promoting oral health from birth with advice, support and clinical prevention (fluoride varnish and fissure sealants) tailored to the needs of the individual child via primary care dental services.</p> <p>Childsmile practices will also be a mechanism for delivering appropriate decay management (as described in this guidance) throughout childhood.</p>
Childsmile core toothbrushing	From birth to 5 years of age	<p>Oral health packs given to every child aged 1, 3 (two packs), 4 (two packs), and 5 years old.</p> <p>Every child in daily supervised nursery toothbrushing.</p> <p>20% of children (most deprived quintile local SIMD) at P1, P2 to be in daily supervised toothbrushing programmes.</p>

<p>Childsmile Nursery (targeted within the most deprived local SIMD quintile)</p>	<p>At 3–4 years of age</p>	<p>Fluoride varnish applied six-monthly via Childsmile dental teams consisting of extended duty dental nurses and a dental health support worker.</p>
<p>Childsmile School (targeted within the most deprived local SIMD quintile)</p>	<p>From 5 years of age</p>	<p>Fluoride varnish applied six-monthly via Childsmile dental teams consisting of extended duty dental nurses and a dental health support worker.</p> <p>Fissure sealants applied at 6–7 years of age.</p>

Appendix 3: The Stephan Curve

It can be hard to visualise what happens in the mouth every time an individual eats or drinks something. To make it easier the Stephan Curve is used to graphically illustrate this process.

The graph below at example one shows the frequency of acid attacks over a 24-hour period. It shows what would happen if someone had eaten three meals with six snacks in between. As each sugary intake is consumed, acid attacks occur more often and damage is caused to teeth. The pH of dental plaque drops (becomes more acid) and then it slowly goes back up. It takes time for the saliva to bring the pH back up.

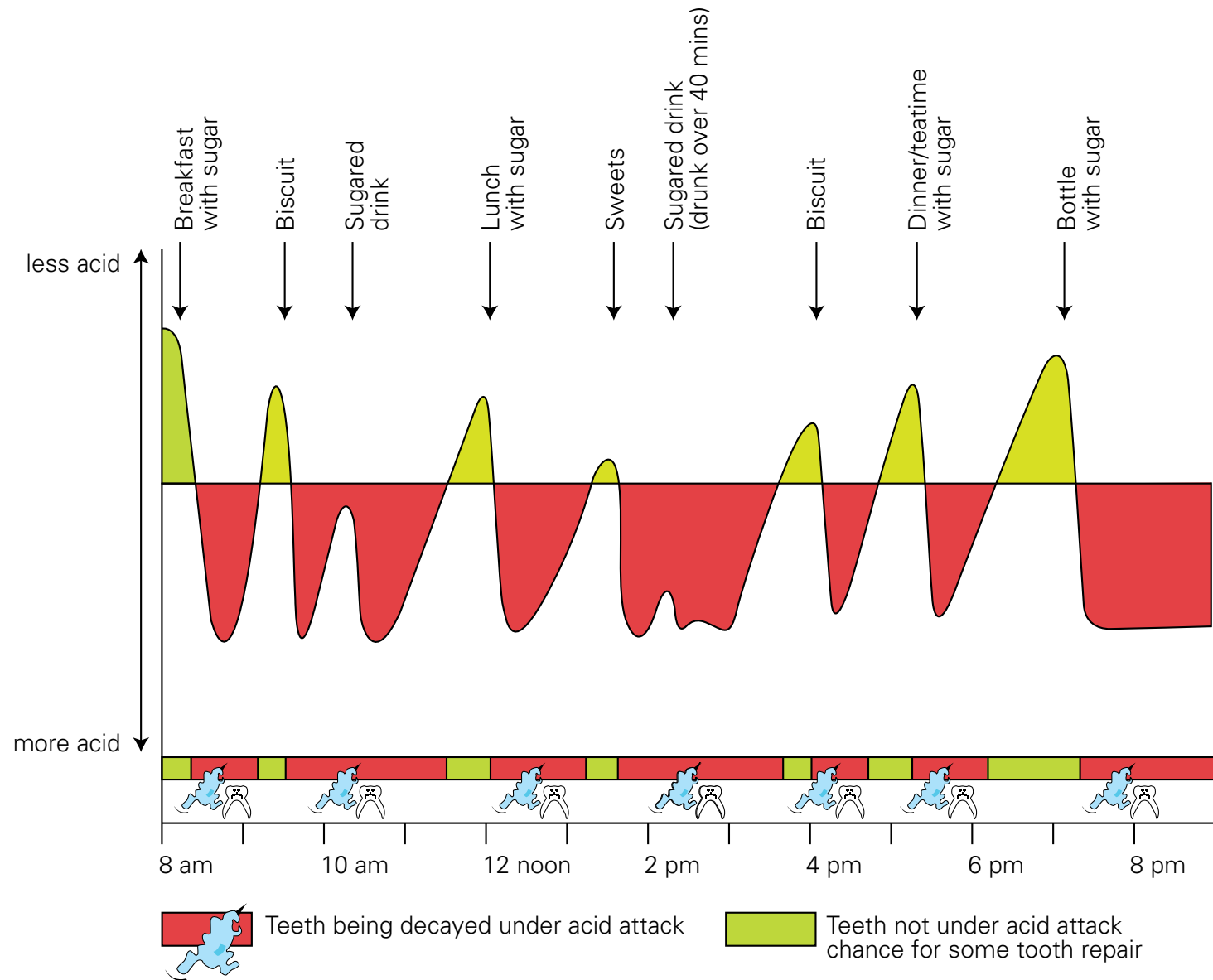
Prolonged exposure to sugar (e.g. a sugary drink drunk over 40 minutes) is more damaging for the teeth than consuming the drink in one go as the teeth are constantly under acid attack. With a high frequency and duration of sugar being left in the mouth, it means there is less time for the teeth to repair and tooth decay is likely.

Example two shows the difference to the mouth when someone eats three meals with three healthy snacks (e.g. oatcakes, glass of milk with slice of apple, toast) rather than sugary foods and drinks. There are fewer acid attacks as the snacks are healthy and there is more chance for some tooth repair.

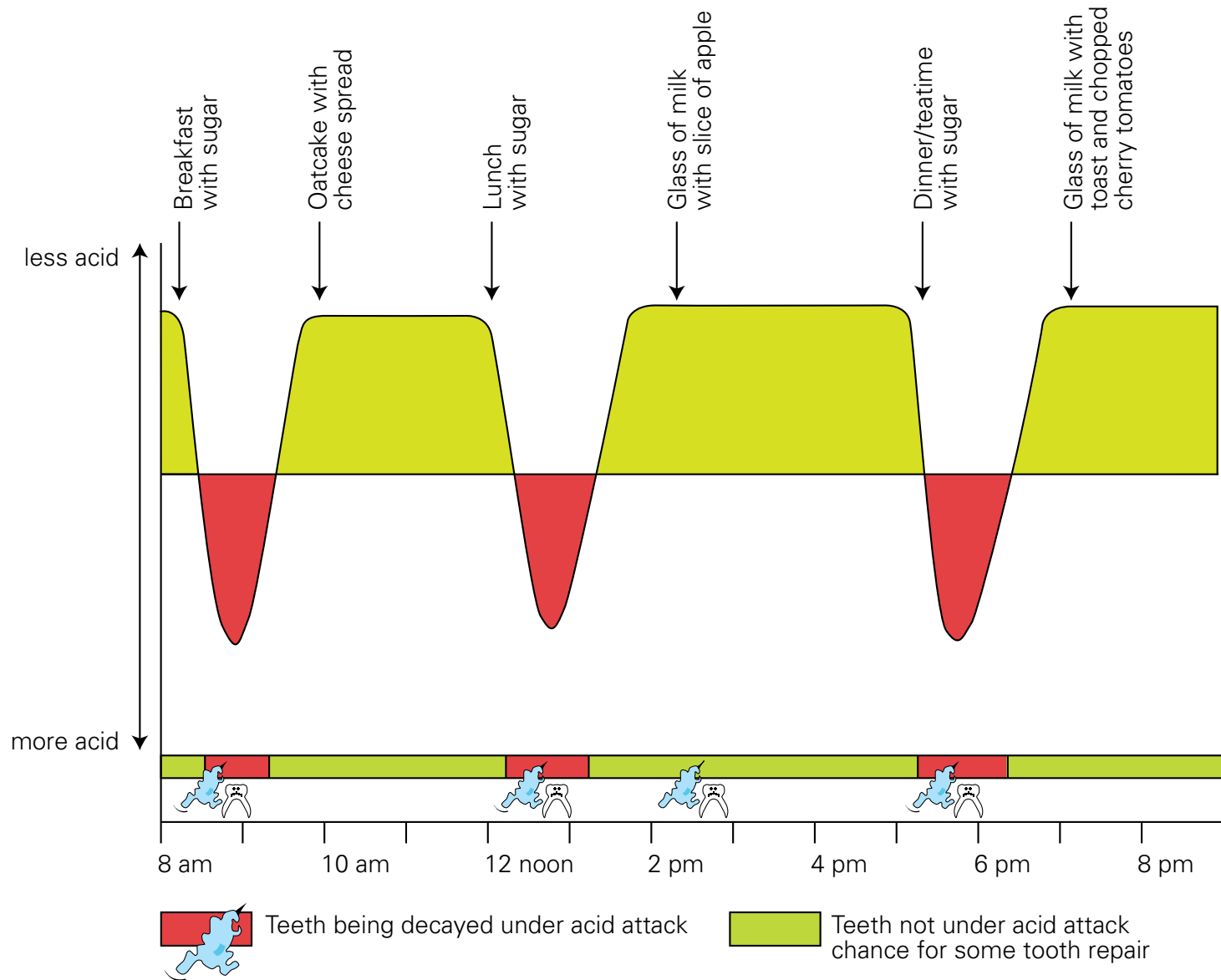
The accepted dental health message to reduce tooth decay is to reduce the amount and frequency of intake of food and drinks containing sugar. Avoiding frequent snacking and restricting sugar to mealtimes will help protect the health of the teeth. This message is the same for each age group.

Childsmile Programme Manual, 2011

Stephan Curve – Example 1



Example 2



Appendix 4:

Scottish Commentary on NICE Public Health Guidance 11, recommendation 19 (oral health)

Target population

Parents and carers of infants and pre-school children.

Who should take action?

Public health nurses or health visitors, GPs, dentists, dental hygienists/assistants, community and day-care nursery nurses, home-based child carers and others who work with young children.

What action should they take?

Encourage parents and carers to:

- use a bottle for expressed breast milk, infant formula or cooled boiled water only
- offer drinks in a non-valved, free-flowing cup from age 6 months to 1 year
- discourage feeding from a bottle from the age of 1 onwards
- limit sugary foods to mealtimes only
- avoid giving biscuits or sweets as treats

- encourage snacks free of salt and added sugar (such as vegetables and fruit) between meals
- provide only milk and water to drink between meals. (With meals, pure unsweetened fruit juice can also be provided – diluted about 50:50 with water, or with a greater proportion of water to juice if a longer, more thirst-quenching drink is preferred.) [Scottish contextual point – The original NICE action point includes the statement ‘diluted fruit juice can be provided with meals – 1 part juice to 1 part water’. The text in round brackets above reflects advice given in the Scottish Government’s *Nutritional guidance for early years: food choices for children aged 1–5 years in early education and childcare settings*.⁵⁸ There is no firm evidence base for advocating a precise level of dilution. Risk of damage to teeth falls with increasing dilution, but so too does nutritional benefit.

Discourage parents and carers from:

- adding sugar or any solid food to bottle feeds
- adding sugar or honey to weaning (solid) foods
- offering baby juices or sugary drinks at bedtime.

Appendix 5:

Useful resources and websites for parents/carers and professionals

For parents/carers

First Teeth, Healthy Teeth: A guide for health professionals, parents and carers

www.healthscotland.com/documents/3251.aspx

Fun First Foods: An easy guide to introducing solid foods

www.healthscotland.com/documents/303.aspx

Hassle Free Food: A guide to cheap, quick and healthy eating

www.healthscotland.com/uploads/documents/9598-MiniHassleFreeFood.pdf

Ready Steady Baby! (book and website)

www.readysteadybaby.org.uk

Ready Steady Toddler! (book and website)

www.readysteadytoddler.org.uk

You and Your Baby 0–1 and You and Your Little Child 1–5

Produced by CHANGE, an organisation specialising in resources for parents and families with learning disabilities.

(To obtain a copy, contact NHS Health Scotland publishing department on the details provided below).

Off to a good start: All you need to know about breastfeeding your baby

www.healthscotland.com/documents/120.aspx

Vitamin D: An essential nutrient for all... but who is at risk of vitamin D deficiency?

www.healthscotland.com/uploads/documents/15976-VitaminDProfessional.pdf

Oral health DVD *How to Protect your Children's Teeth*
(free to all parents/carers, via their Childsmile Coordinator)

bump to breastfeeding DVD

(free to all parents/carers, via their Health Board)

Childsmile

www.child-smile.org

Email: childsmile@nhs.net

British Dental Association

www.bda.org

British Dental Health Foundation

www.dentalhealth.org

Healthy Start

www.healthystart.nhs.uk

To obtain a hard copy of NHS Health Scotland publications contact nhs.healthscotland-publications@nhs.net or call 0131 536 5500

For professionals

NHS Health Scotland Knowledge Services

NHS Health Scotland Knowledge Services (formerly Health Scotland Library) can support oral health practitioners and dietitians via our literature search service, our current awareness alerts and our book and resource lending. Our catalogue can be accessed here: **<http://shelcat.org/nsco>**, and our website here:

www.healthscotland.com/knowledge

Email: nhs.healthscotland-knowledge@nhs.net

Childsmile briefing sheets

www.child-smile.org.uk/professionals/information-for-childsmile-coordinators/resources.aspx

Fun First Foods briefing paper for professionals

www.healthscotland.com/documents/4276.aspx

Maternal and early years website for early years professionals

www.maternal-and-earlyyears.org.uk

Early Years Information Pathway

www.healthscotland.com/documents/3708.aspx

Food Standards Agency Scotland, Eatwell

www.eatwellscotland.org

Scottish Intercollegiate Guideline 115

Management of Obesity

www.sign.ac.uk/guidelines/fulltext/115/index.html

Help finding an NHS dentist

www.scotland.gov.uk/Topics/Health/NHS-Scotland/dentistry/dentists

or call the NHS Helpline on 0800 224488

National Dental Inspection Programme (NDIP)

www.scottishdental.org

Scottish Intercollegiate Guidelines Prevention and Management of Dental Decay in the Pre-school Child (SIGN 83)

www.sign.ac.uk/pdf/qrg83.pdf

Scottish Intercollegiate Guideline Preventing Dental Caries in Children at High Caries Risk

www.sign.ac.uk/pdf/qrg47.pdf

Scottish Dental Clinical Effectiveness Programme

www.scottishdental.org/cep

Survey of sugar intake among Children in Scotland

www.food.gov.uk/multimedia/pdfs/sugarintakescot2008rep.pdf

Appendix 6:

Sugar-free chewing gum and xylitol-containing gum

It is now possible to buy sugar-free chewing gums sweetened by sugar alcohols or polyols like xylitol, sorbitol and mannitol.

Sugar-free chewing gum may have a positive benefit for dental health as it stimulates salivary flow during chewing and helps to reduce acidity in the mouth.^{10,11}

Sugar-free chewing gum sweetened with xylitol has potential additional benefits due to a specific effect on the dental disease causing bacteria *Streptococcus Mutans*.⁵⁹

Chewing gum is not recommended for infants and young children and is prohibited in schools. Additionally, it is not recommended for nutritionally vulnerable older people or those who have cognitive impairment due to the risk of choking.

Appendix 7:

Glossary

Bioactive compounds

There are some compounds in foods (bioactive components) that do not fall into the categories of vitamins and minerals or nutrients, e.g. lycopene or flavonoids. Some of these components help to protect against ill health and disease.

Caries

Scientific name for dental decay. It is both singular and plural.

Cariogenic

Capable of promoting the development of caries (cavities). Describes any food containing sugars or cooked starches that can be used to form acid by bacteria living in plaque on teeth.

Cavity

A hole occurring in the outer surface of the tooth enamel.

Demineralisation

The process by which minerals are leached out of tooth enamel. This occurs when the bacteria in plaque produces acids that can attack tooth enamel (see remineralisation).

Dental plaque

Dental plaque is a sticky film of bacteria that forms on all surfaces of the teeth.

Dehydration

Loss of fluid from the body from illness or not drinking enough fluids.

Dental erosion

Loss of tooth surface.

Dentate

Having natural teeth.

Edentulous

Having no natural teeth.

Enamel

Hard tissue covering the visible surface of the tooth.

Energy density

Energy density foods provide more calories per volume and few nutrients.

Enzyme

A protein which acts as a catalyst in promoting one or more of the many chemical reactions in the body. Enzymes in saliva help dissolve cooked starches into sugars so they become soluble and can clear the mouth or be fermented by plaque bacteria.

Extrinsic sugar

Sugars that are not incorporated within the cellular structure. Extrinsic sugars can occur naturally in food and drink, for example in honey or lactose present in milk. Extrinsic sugars, with the exception of lactose in milk and milk products, are the prime contributors to tooth decay.

Fermentable carbohydrates

Any sugar or cooked starch that can be metabolised by oral bacteria to produce acid.

Fissure

The grooves on the surface of back teeth where decay often starts.

Fissure sealant

A thin plastic coating applied to protect biting surface of tooth from decay.

Fructose

A simple sugar found in honey and fruits.

Free sugars

All added sugars in fruit, honey and syrup.

Gingivitis

Gingivitis is the early stage of gum disease where the gums become inflamed by plaque that accumulates at the base of or in between the teeth next to the gum margin. It is reversible with improvements in oral hygiene.

Glucose

A simple sugar, also known as dextrose, found in many foods.

Gum disease

There are two stages of gum disease: gingivitis and periodontitis (see separately).

Intrinsic sugars

Sugars which are part of the structure of the food, for example sugars found naturally occurring in fruit.

Lower cariogenicity

Less likely to cause tooth decay.

Milk sugar (lactose)

Sugars which are naturally present in milk and milk products.

Non-milk sugar (NMEs)

Sugars not found within the structure of food (extrinsic sugar) present in a free form. When fruit is juiced or blended, for example, the sugars are released and become NMEs.

Nursing bottle decay

Also known as early childhood caries, this is the rapid decay of baby teeth when front teeth are exposed to sugars for long periods of time.

Nutritionally well

Individuals who have normal nutritional requirements and normal appetite or those with a condition requiring a diet that follows healthier eating principles.

Nutritionally vulnerable

Unexplained or unintentional weight loss, physical difficulties eating or drinking (e.g. arthritis, learning disabilities), have acute or chronic illness affecting food or drink intake (e.g. flu, cancer), cognitive or communication difficulties, require the texture of the food or fluid to be modified.

Nutrient dense

Nutrient density refers to the amount of nutrients for the given volume of food. Nutrient-dense foods are foods that provide a substantial amount of vitamins and minerals but very few calories, e.g. fruit and vegetables. Nutrient-dense food is opposite to energy-dense food (see energy density).

Plaque

An invisible, sticky film that forms on teeth, giving them a 'fuzzy feel'. Plaque contains bacteria that can ferment sugars and cooked starches in foods to form acid.

Periodontal disease

This term encompasses both gingivitis and periodontitis.

Periodontitis

Periodontitis is an irreversible process where destruction of bone and fibres around the teeth make them mobile and can lead to loss of teeth. This is a slow process but periodontitis is the main cause of tooth loss associated with ageing.

Polypharmacy

Polypharmacy is the use of more than three medicines at one time.

Remineralisation

The process by which the minerals from saliva enter the tooth surface to repair it (see demineralisation).

Root caries

When gums recede the root surface becomes exposed and is susceptible to decay.

Starch

A carbohydrate polymer composed of glucose molecules. All starches are broken down in the body to the simple sugar glucose before they can be used.

Sucrose

The scientific name for table sugar, a mixture of the two simple sugars, glucose and fructose.

Tooth decay

Also known as dental caries or cavities, this is caused when sugar from food and drinks react with plaque to produce acid. The acid causes early tooth decay, which can be repaired by calcium, phosphate and fluoride in the saliva. If you eat or drink sugar too often, over time the decay breaks down the enamel of the teeth to form a hole (cavity).

Under-nutrition

Unplanned weight loss or nutrient deficiency resulting from lack of calories from the diet.

Appendix 8:

Membership of Oral Health and Nutrition Reference Group

The Oral Health and Nutrition Reference Group is a group convened by NHS Health Scotland that brings together key stakeholders from dentistry, nutrition and dietetics and others. The key aim of the reference group is to develop guidance for professionals.

Graham Ball

Consultant in Dental Public Health
(representing Childsmile Programme)

Fiona Bayne

Senior Health Promotion Specialist
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(representing Public Health
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Harry Black (Former Chair)

Head of Health Promotion, NHS Fife

Ruth Campbell

National Infant Nutrition Coordinator,
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Michael Craig

Public Health Advisor,
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Maura Edwards

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Tina Everington

Senior Health Promotion Officer
Oral Health, NHS Forth Valley

Irene Foster

Health Improvement Programme
Officer: Oral Health, NHS
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Ruth Freeman

Director of Oral Health and Health
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Laura Hunter

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Colwyn Jones (Chair)

Consultant in Dental Public Health,
NHS Health Scotland

Lorna Macpherson

Professor of Dental Public Health,
NHS Greater Glasgow & Clyde

Tracy Moynihan

Community Dietitian,
NHS Ayrshire & Arran

Cindy Murray

Health Visitor, NHS Greater Glasgow
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Leona O'Reilly

Project Manager (representing Scottish
Diet Resource Initiative)

Heather Peace

Senior Dietary Advisor (representing
Food Standard Agency in Scotland)

Elizabeth Peat

Oral Health Improvement Manager,
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Helen Yewdall

National Maternal and Infant Nutrition
Coordinator, Scottish Government,
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