



Practical help and information
on nutrition and development

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EARLY NUTRITION FOR LATER HEALTH

A report from the Infant & Toddler Forum
Study Day, London 2008

**Addressing key issues on the nutritional requirements
and eating behaviour of one to three year olds**

Supported by an educational grant from Danone UK.

INTRODUCTION

It is never too early to begin promoting a healthy diet. The younger children learn how to eat healthily, the more likely they are to adopt a balanced diet in adult life. Early nutritional guidance may therefore be a key public health strategy in preventing obesity, thereby reducing a child's risk of developing a range of chronic conditions such as cardiovascular disease, diabetes and cancer in later life.

This was the message offered to health visitors, nursery nurses and other health professionals attending this year's Infant & Toddler Forum (ITF) Study Days in London and Leicester. Now in their fourth year, the ITF Study Days have become essential diary dates for health and childcare professionals seeking up-to-date evidence-based information on nutrition during the early years.

This year's talks drew on a number of recent government initiatives – The Healthy Weight, Healthy Lives Cross Government Strategy on tackling obesity¹, Child Health Promotion Programme and the Children's Plan², all of which have recognised the important role that health visitors, and other child and healthcare professionals (HCPs) have in guiding parents in how to feed their children.

To fill this role HCPs need up-to-date information. However, even though the toddler years are a crucial time when dietary habits and preferences are developed, there is very little easily available information on the subject and this has led to much confusion for parents and carers.

It was the aim of this year's Study Days to highlight some key areas where nutritional habits can have a considerable impact on health. Presented by a multidisciplinary group of experts with first-hand experience in child nutrition, growth and development, the presentations were designed to offer practical guidance on how to advise parents on feeding their children through the toddler years.



Professor Lawrence Weaver
Chair, Infant & Toddler Forum

STUDY DAY SPEAKERS ACROSS THE TWO EVENTS

Dipti Aistrop, Health visitor and specialist health visitor for mental health of young children, nurse representative Sheffield PCT

Jackie Blissett, Senior Lecturer in Psychology, University of Birmingham

Elaine Farrell, Paediatric Dietitian, Nutrition & Dietetic Services Manager at Colchester University NHS Foundation Trust and North East Essex PCT

Dr Gillian Harris, Senior Lecturer in Applied Developmental Psychology, University of Birmingham and Consultant Paediatric Clinical Psychologist, The Children's Hospital, Birmingham

Dr Alex Richardson, Founder Director of Food and Behaviour Research, Visiting Research Scientist at Universities of Oxford and Bristol. Based at Oxford University's Dept of Physiology, Anatomy and Genetics

Dr Atul Singhal, Honorary Consultant Paediatrician, Whittington Hospital and Great Ormond Street Hospital, Deputy Director, MRC Childhood Nutrition Research Centre and Reader in Paediatric Nutrition at the Institute of Child Health (ICH), London

Dr Carina Venter, Senior Dietitian, PhD, The David Hide Asthma and Allergy Research Centre, Portsmouth

Professor Lawrence Weaver, Samson Gemmell Professor of Child Health, University of Glasgow, Consultant Paediatrician

Professor Richard Welbury, Chair of Paediatric Dentistry, University of Glasgow

WHAT THE DELEGATES SAID

*'Great variation of speakers-
glad oral health highlighted'*

Oral Health Promoter, West Kent
Primary Care Dental Service

*'Excellent for teaching
one-to-one with parents'*

Community Nursery Nurse, Teddington Clinic
Richmond & Twickenham PCT

*'All extremely useful and
crucial for own development'*

Childhood Obesity Prevention Assistant Practitioner
(under 5's), Kensington & Chelsea PCT

*'Excellent very informative and
good tools to use'*

Community Nursery Nurse, Skidmore Way Clinic

*'I always find these study days
inspirational and I want to rush
back to work and change the
world!!'*

Health & Family Support Manager, Children's Centre

*'Very glad to have discovered
the Forum, impressed by what
I have seen so far'*

Parent Involvement Worker, Sharrow Surestart

*'Excellent resources, easy to
download factsheets, excellent
study day'*

Community Nutrition Assistant, Children's Centre –
Newark & Sherwood

THE MARCH OF TIME

The link between wealth and health was once graphically illustrated in an ingenious study conducted in the Victorian graveyards of Glasgow³. This showed that the length of a person's life in the mid 1800s was directly proportional to the height of their gravestone. In other words those who could afford a large gravestone, lived longer.

Consultant psychologist Dr Gillian Harris used this example in her introduction to the study day to emphasise the long-standing relationship between socioeconomic status and health.

However, Dr Harris pointed out that the relationship between nutrition and income has recently undergone a significant change.

"Historically poverty has been associated with under-nutrition," she said. "For instance during the Boer war one third of recruits were too undernourished to be allowed on active service. After the First World War there was concern about malnutrition among poor children and subsidised school meals were first brought in."

In the 1930s free school milk was introduced.

"So the problem was of under-nutrition and obesity was associated with affluence."

Over the past 30 years, however, there has been a change in emphasis, said Dr Harris. Children have become less active and energy-rich, easy-to-prepare food has become cheaper and more readily available.

"So what we have today are parents who don't know how to cook and children who are underactive. The computer and television age in developed countries has led to a burgeoning obesity crisis, not in the rich but in the poor."

Breaking this cycle will require multi-agency intervention right across all ages, said Dr Harris. However, dietary advice during the first few years of life is particularly important.

"Food preferences are set up in the first few years of life so we need to get the intervention in during the first few years of life," she said.

Dr Harris explained that there is a "developmental agenda for feeding" during which the newborn child and young infant gradually develops tastes and food preferences that can last for the rest of his or her life.

*"At birth there is an innate preference for a sweet taste. Then between three to five months there is a window of acceptance for new tastes."*⁴

This is the ideal time to start introducing new, healthy food choices, said Dr Harris.

"Preference is a function of exposure and is based on taste and smell."

Between six to 12 months young children start to become more sensitive to the introduction of solid textures and between one to two years they start to recognise food by appearance. This can lead to the rejection of new foods and some previously accepted foods.

Dr Harris presented evidence from the Avon Longitudinal Study of Pregnancy and Childhood (ALSPAC) suggesting that the time at which solid food is introduced into the toddler diet plays a crucial role in the child's later food preferences and whether or not they experience any feeding difficulties^{5,6}.

How introduction of solid foods can affect subsequent feeding difficulties⁵

Age of introduction	Feeding difficulties at 15 months
<6 months	29.1%
6-9 months	38.6%
>10 months	52.3%

“Using the ALSPAC database we found that children introduced to lumpy solids after the age of nine months had more feeding problems at seven years (food refusal and food fussiness). But perhaps more interestingly we also found there was a difference in the foods accepted by these children,” said Dr Harris.

These results emphasise the important influence of early feeding practices on later nutrition and therefore later health (see box), she stressed.

Importance of early feeding – key points

- Exposure before six months predicts consumption of fruit and vegetables at seven years
- Weaning and early feeding practices will contribute to later childhood diet and possibly childhood obesity
- The earlier children are introduced to healthy foods the more likely they are to accept it
- The older they are introduced to lumpy foods the less likely they are to like fruit and vegetables

“Children who were introduced to lumpy solids after nine months of age ate fewer of all ten categories of fruit and vegetables than did children introduced to lumpy solids before this age,” said Dr Harris. *“Children introduced to lumpy solids before the age of six months ate more green vegetables, tomatoes and citrus fruits than did children introduced after six months.”*

POLICIES, TARGETS AND STRATEGIES TO HALT THE TREND OF OBESITY

Few could fault the political commitment the government has shown towards combating the child obesity crisis. However, the key question is whether the deluge of reports, initiatives, strategies and big money programmes has made any demonstrable difference on the children themselves, their parents and the health and childcare professionals who advise them.

Health visitor Dipti Aistrop listed some of the many government initiatives that are attempting to stem the rising tide of childhood obesity. These include:

- The Healthy Schools Programme – a joint initiative between the departments of health and children, schools and families
- Healthy Start – replaced the welfare food scheme and implemented nationally in 2006
- Family Nurse Partnership Programme – a £30 million nurse-led home visiting programme aimed at vulnerable young parents
- Child Health Promotion Programme – a good commissioning tool to promote health and wellbeing from pregnancy through to five years old
- Children’s Plan – an £850 million ten year strategy aimed at the years from 0 to 19
- Healthy Weight Healthy Lives – a £372 million cross-government strategy that aims to make the UK the first major nation to reverse the rising tide of obesity
- Child Health Strategy – focus on school meals, and education on healthy eating.

“Look at the amount of money the government is putting into this,” stressed Ms Aistrop.

“Of course the question is how much is filtering down to where it really matters.”

Moreover, it is very difficult to answer this question, she said, as currently very little of the money is being spent on evaluating the effect of the various programmes.

“There is a huge amount of financial resources being put into it but at the moment we are really struggling with the lack of evaluation and audit,” said Ms Aistrop.

“Evaluation is generally haphazard or non-existent.”

Another concern is that any initiative that focuses on difficult to reach groups can help some but leave others even further disenfranchised.

“A real worry with all of this is that we are only going to engage with those who are receptive to it and that will worsen the health inequalities,” said Ms Aistrop.

Nevertheless she urged the audience to familiarise themselves with the various initiatives and use them both to improve their practice and to lobby commissioners for better resources.

Health visitors, in particular, are ideally placed to make a significant impact on the obesity epidemic, she said.

“We all know that if you target families at risk early enough, you are more likely to reduce the risk of overweight. There’s a lot of evidence that parents are more receptive to lifestyle advice in the early stages - when they are pregnant or have young children - and this is the time when health visitors are able to make a significant difference.”

Ms Aistrop illustrated the importance of this advice by using the interactive voting system to show how parents were often unaware of their children’s inactivity⁷ (see box):

Interactive voting:

Q: “How much activity does NICE recommend per day for children?”

A: Over 50 per cent of the audience gave the correct answer - 60 minutes.

Q: “How much activity do parents think their six to seven year old children get each day?”

A: Only 15 per cent of the audience gave the correct answer - 140 minutes.

Q: “How much activity did these children actually get each day?”

A: 66 per cent of the audience gave the correct answer – 24 minutes.

Ms Aistrop pointed out that despite the apparent commitment at strategic level to combat obesity, there remains a number of practical barriers to implementing the policies.

For instance there is a danger that the extra workload could overwhelm an already overstretched and under-resourced health visitor service.

“A lot of health visitors have gone away from GP practices and now have huge caseloads,” said Ms Aistrop. *“So there’s a capacity problem. But if that is the case then we need to be lobbying for better resources. We need to be lobbying the commissioners.”*

Ms Aistrop stressed that childhood obesity cannot be tackled by any single agency on its own. Multi-agency intervention is needed, she said, involving health, education and childcare professionals.

“You can’t just focus on one service, you’ve got to look at the whole system.”

“All agencies need to be looking at their role,” said Ms Aistrop. *“Working in partnership works very well. But we need to make sure this doesn’t just become rhetoric, and to do that we need a lot more resources for the front line services.”*

CHILDHOOD OBESITY: CAUSES AND CONSEQUENCES

Frontline child and healthcare practitioners have a key role in helping the UK to achieve its target of reversing the childhood obesity epidemic, consultant paediatrician Dr Atul Singhal told the meeting.

"It is very difficult for children to lose weight so we should try to prevent obesity in the first place, using both public health approaches and individual approaches."

In doing this, HCPs will not only be helping to combat childhood obesity, but also help to prevent a major epidemic of obesity related problems, such as diabetes, cancer and heart disease in adults, he said.

"One in three obese three to five year olds will become obese adults," said Dr Singhal.

"Childhood obesity doubles the risk of later cardiovascular disease. If you are a fat toddler you are likely to become a fat adult. If you are obese as a child then you are ten per cent more likely to die of cardiovascular disease (CVD)."

"We have a major role in affecting the health of the next generation and (primary) prevention of cardiovascular disease should begin in childhood," said Dr Singhal.

Unfortunately, identifying children at risk of becoming obese is not as easy as it might appear, said Dr Singhal.

"It's not easy to diagnose obesity and it's particularly difficult in children. There's a huge variation in body shape and body size among children, so the simple BMI cut-off figures that we use in adults do not apply."

For this reason specially adjusted BMI centile charts have been produced for use in children.

Dr Singhal said a BMI calculation should be made for any child whose:

- weight is two centiles above his or her centile for height on a normal child growth centile chart
- weight is above the 98th centile
- weight is crossing centiles upwards
- parents express concern

Unfortunately many health visitors are currently uncertain on how to use BMI calculations, said Dr Singhal. A recent ITF survey of 160 health visitors and nurses in England and Scotland revealed that 48 per cent did not feel confident in measuring BMI.

Dr Singhal urged the audience to visit the ITF's Open Book on Growth (www.infantandtoddlerforum.org) where detailed instruction is available on how and when to monitor children's growth, when to refer and how to deal with parents' concerns.



Addressing the childhood obesity epidemic will require both public health measures – education on diet and exercise, policies to improve school buildings, catering and curriculum and to encourage children to walk or cycle to school – and measures aimed at the individual child, said Dr Singhal. It is particularly important to encourage new mothers to breastfeed their children, he added.

“There are at least 27 studies showing that breastfeeding decreases obesity in later life. The benefits of breastfeeding could be related to slower growth. If you grow too quickly in infancy you are at increased risk of obesity in later life. It is estimated that 30 per cent of the risk of obesity can be explained by early growth.”

Recommendations for carers and parents include:

- eat regularly as a family and not in front of the TV
- encourage active play with children
- watch less TV
- involve the whole family in activities
- play sport

“The key priorities for frontline healthcare staff are to use the BMI centile charts, try to address the multiple components of obesity, address lifestyle issues and do this within the family and social setting.”

FOOD AND BEHAVIOUR

Poor nutrition can not only affect children’s physical health, it may also impair their mental development.

Dr Alex Richardson, senior research fellow at Oxford University’s department of physiology, anatomy and genetics, told the meeting that problems with behaviour and learning and conditions such as dyslexia, dyspraxia, hyperactivity and autism could all be related to childhood diet and nutrition.

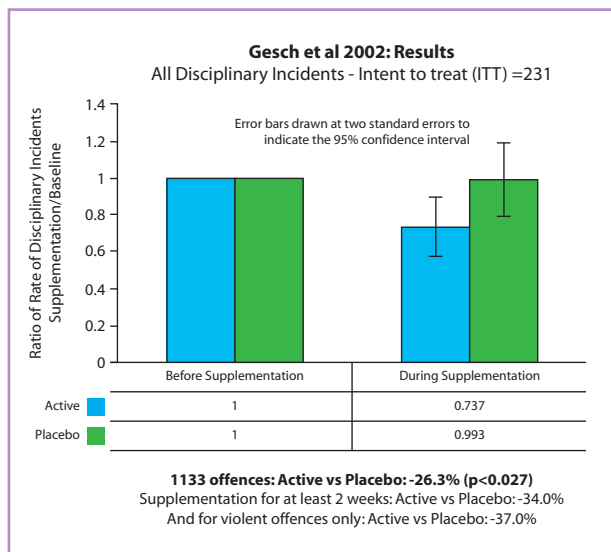
“Appropriate nutrition is essential for growth and development, building, maintaining, fuelling and repairing every cell in every part of the brain and body,” said Dr Richardson. *“Yet we still have psychiatrists who will say that diet has nothing to do with behaviour. That’s nonsense. Food and diet is fundamental.”*

Dr Richardson presented the results of a study conducted in a high security young offenders’

institution in which 231 young offenders were given either a multivitamin and fatty acid supplement or a placebo⁸.

“The results were nothing short of striking,” said Dr Richardson.

Over two weeks the number of disciplinary incidents involving prisoners given the supplements was 34 per cent lower than those given the placebo. For violent offences the reduction was by 37 per cent.



Dr Richardson expressed concern that relatively recent changes in the childhood diet could ignite a sharp rise in behavioural problems.

She presented data showing that between 1983 and 1997 there was a 64 per cent rise in the consumption of high-sugar drinks by children. Between 1998 and 2002 there was a 68 per cent rise in spending on crisps, chocolate, gum and cigarettes on the way to school.

A Consumers Association report in 2003 compiled food diaries for 246 primary and secondary school pupils. This showed their diets were high in saturated fat, sugar and salt and low in many vital nutrients including zinc, iron, protein, calcium, folate and vitamins A and C. The most commonly eaten foods were crisps, chips and chocolate bars. The least favourite were fruit and vegetables.

Dr Richardson also presented figures showing alarming deficiencies in the dietary provision of vitamin A, zinc and iron.

“One in ten of our children are not getting enough vitamin A. With zinc there is the same problem. Nearly half of our teenage girls are not getting enough iron. This is shocking and terrifying. And we call ourselves a developed country.”

To make matters worse, said Dr Richardson, the food industry has begun introducing a wide variety of additives into food that either have no nutritional value or are directly harmful. Recent additions include:

- pesticides and other synthetic chemicals from agricultural and industrial pollution
- antibiotics and growth hormones
- preservatives (e.g. salt, sugar, sodium benzoate)
- flavourings (e.g. salt, sugar, MSG etc)
- colourings (e.g. azodyes like tartrazine)
- sweeteners (e.g. aspartame)
- texture modifying agents (e.g. modified starches, trans fats)

There is growing evidence that many of these food additives can have an adverse effect on children’s behaviour, said Dr Richardson.

She presented results of a meta-analysis of trials on artificial food colourings (AFC) and hyperactivity⁹ which showed that these food colourings did have adverse effects on children’s behaviour.

“On average, the benefits of removing AFC from the diet were around 0.3 - 0.5 the size of the usual benefits from medication,” said Dr Richardson. *“So drugs are not the answer in ADHD.”*

Depression also shows a strong association with diet, with the omega 3 fatty acids (found in fish and seafood) appearing to offer a degree of protection.

Indeed the American Psychiatric Association currently recommends that all adults should eat fish at least two times a week¹⁰. Patients with mood, impulse control or psychotic disorders should consume 1g/day of the omega 3 fatty acids EPA and DHA.

Dr Richardson expressed concern that the continued emphasis on low fat diets could be sending the wrong message on the diet necessary for brain development.

“The human brain is 60 per cent fat, and it matters what kind,” she said. *“Dietary advice has not been taking this into account. Everybody has absorbed the message that a low fat diet is good. But not if it means high sugar and low nutrients it isn’t.”*

Dr Richardson said it is particularly important that our diet strikes the right balance between the two essential fatty acids omega 3 and omega 6. Both are essential, she stressed, but modern diets tend to be too high in omega 6 and too low in omega 3.

For those wishing to strike a better balance between omega 3 and omega 6 in their diets, Dr Richardson recommended a few simple dietary changes:

- eat more fish and seafood, green vegetables, nuts, seeds
- eat less meat, dairy products, refined vegetable oil

“Omega 3 fatty acids from fish oils are absolutely essential to the visual system,” said Dr Richardson. *“Omega 3 deficiency is associated with poor night vision and other problems with visual, spatial and attentional processing.”*

Omega 3 can also reduce inflammation, reduce blood clotting and relax blood vessels, she said.

There is also evidence that supplementation with omega 3 can help children with behavioural and learning problems.

Dr Richardson presented the results of a study of 41 children aged eight to 11¹¹. All had specific reading difficulties and scored above population averages on parent ratings of ADHD symptoms.

The children were randomly allocated to receive highly unsaturated fatty acids (HUFA)

supplementation or placebo for 12 weeks. After 12 weeks cognitive problems and general behaviour problems were significantly lower for the group treated with HUFA than for the placebo group.

Other studies have shown a beneficial effect of fatty acid supplements in children with inattention, hyperactivity and disruptive behaviours¹², and with developmental coordination disorder¹³.

“The take home message is that no primary school child is able to make informed choices and children’s current food choices do affect the way their brains develop and function,” said Dr Richardson. *“So the issues are not just about obesity and poor physical health. Nutrition affects mental health and performance throughout life, so it’s worth getting the basics right.”*

“Getting the fats right is the single most important thing we can do for nutrition today.”

THE PSYCHOLOGY OF EATING: THE EARLY YEARS

While most interventions to combat obesity focus on the environmental causes – lack of exercise, poor diet – there are a number of psychological approaches that can be effective in breaking the cycle of behaviour that can result in overweight parents bringing up overweight children.

Psychology lecturer Dr Jackie Blissett from the University of Birmingham told the meeting that there are a huge number of factors that can interact in a very complex way to cause obesity¹⁴.

However, she said there are three key influences on children that guided the way they felt about their weight – their family, the media, and their peers.

Of these, the family is by far the most important. Parents, for instance, influence their children’s diet from the moment they are born.

“Breast feeding is important as it introduces the infant to a much broader range of tastes than formula alone,” said Dr Blissett. *“Weaning is also a very important time for setting eating behaviours.”*

Parents’ own eating habits also have a huge influence over how their children are likely to eat in later life.

“Often the parents aren’t great models of healthy eating and if the parents aren’t eating appropriately then the children won’t either,” said Dr Blissett.

Parental practices such as making children ‘clear their plate’, or using food as a reward for good behaviour or for eating something healthy, can also reinforce an unhealthy psychological approach to eating.

“Using sweet food as a reward for eating their vegetables just doesn’t work,” said Dr Blissett. *“All it does is increase the preference for the reward foods. Why is broccoli never the reward? From a very young age, children know exactly what we are trying to do by using these strategies.”*

“These practices stop children listening to their internal signals of hunger and fullness and instead they start responding to external cues for when to start and stop eating.”

Using food to regulate children’s emotions – for example, giving sweets to comfort a crying child – can also cause problems for the future, said Dr Blissett.

“Most parents do this to a certain degree and it’s not a problem. But if it’s done all the time then this may set up significant problems in later years because it teaches children to respond to negative emotion by eating.”

Parental attitudes to dieting are also highly influential, said Dr Blissett. Some 77 per cent of eight to 13 year olds first hear about dieting from a family member and comments by a father about weight appear to be particularly important.

“The message they are receiving about dieting is not the message we want to be getting across,” said Dr Blissett. *“For children who are slightly overweight, we want to be talking about staying weight stable and allowing normal growth to get children back in the healthy range. Parents have a profoundly important role in preventing weight problems at both ends of the spectrum.”*

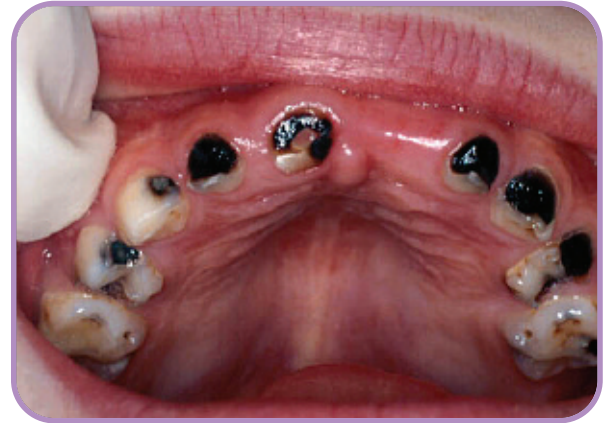
Peer pressure appears to have only a minor influence on weight concerns and dieting behaviour in childhood when compared to family influences, said Dr Blissett. However overweight children do report greater physical activity when in the presence of peers.

It is also the case that the media may influence children’s weight through the promotion of sedentary behaviour, food advertising and the fact that many children ‘graze’ by eating less healthy snacks while viewing television.

Dr Blissett said the best way to encourage a healthy lifestyle for young children is to target their whole family environment. This involves the promotion of an ‘authoritative feeding style’ in which the parent models healthy eating behaviour and decides what goes on the plate, but the child decides what and how much to eat.

“Parent and family factors are the critical determinants of healthy eating and healthy attitudes,” said Dr Blissett.

EARLY NUTRITION AND DENTAL HEALTH



Dental decay in young children is often regarded as of little importance to the child’s overall health. They are only baby teeth after all. But toothache can cause considerable distress and discomfort to a young child causing sleepless nights and absence from school. If the tooth has to be removed, then the experience can scar the child for life.

Prof Welbury told the meeting that 44 per cent of children in the UK have dental decay by the time they are five years old. In fewer than ten per cent of cases is the decay actually treated. In Scotland 16 per cent of children have had a tooth extracted by the age of five. By the age of eight this figure has risen to 48 per cent. In most cases these teeth will be extracted under general anaesthetic (GA).

“23 per cent of all general anaesthetics in Scotland in children are for the treatment of dental decay,” said Prof Welbury. *“In Glasgow 60-80 children per week have a GA for extraction of teeth and in about 50 per cent of children their parents will have had a GA at a similar age for the same reason.”*

"The experience of a GA for extraction of teeth is often deeply traumatic for the child and it may result in them being terrified of dental treatment for life" said Prof Welbury.

Yet much of this distress was totally avoidable, he stressed. *"You can prevent caries. It's not rocket science."*

While there are many factors that govern who is more likely to develop dental decay – socioeconomic status, attitudes and behaviours toward dental treatment, level of parental education and levels of fluoride in the water – there are three preventative factors that can easily be addressed by everyone to prevent dental decay: plaque, fluoride and diet.

"Plaque is the soft collection of micro organisms and food debris that collects around the teeth and concentrates the acids from sugary snacks and foods. It can be removed by good brushing."

"Teeth become susceptible to decay when the enamel is softened. The enamel can be strengthened by using fluoridated toothpaste."

"The diet provides the fermentable carbohydrates that are metabolised to organic acids which then cause demineralisation or softening of the enamel. This process can be prevented by reducing the frequency and amount of sugar intake."

There are two micro organisms that have been mainly implicated in the development of dental caries, said Prof Welbury – *Streptococcus mutans* and *Lactobaccillus*.

These colonise the mouth soon after the teeth erupt and are usually transmitted to the infant from the mother.

"So the next time you see a child throw their dummy on the floor and the mother picks it up and puts it in her mouth to clean it before giving it back to the child, think of Streptococcus mutans."

Giving new mothers chewing gum impregnated with antimicrobial xylitol can significantly reduce the carriage of *Streptococcus mutans* in the mothers' mouth, he said, and delay the development of caries in their children¹⁵.

Parents should be advised to start brushing their children's teeth as soon as the first teeth erupt, said Prof Welbury.

"Brush daily with a smear of paste containing 1000ppm of fluoride up to the age of two and then use a pea-sized amount of 1500ppm paste," said Prof Welbury.

Children should be supervised until the age of eight and always told to 'spit don't rinse'.

"By having a good gargle you are actually removing the benefit of the fluoridated toothpaste," said Prof Welbury.

Teeth should be brushed twice a day – once after breakfast and last thing at night, after which no drinks or food should be given. A child should go to bed having just had their teeth brushed.

"All children should be registered with a dentist from the moment their teeth erupt. Dental practices should accept children on this basis"

Dietary advice should be to choose foods with a low added sugar content.

"Foods with added sugars should be eaten only at meal times," said Prof Welbury. *"Drinks should be taken from a cup or glass, not from a bottle."*

Prof Welbury advised avoiding all baby juices and drinks constituted from fruit concentrates. 'Anything ending in ose' on the labelling was potentially damaging to teeth. Sugar free (SF) medicines should always be dispensed for children where an SF formulation exists. If an SF preparation is not available then the teeth should be cleaned immediately after a sugared preparation is given.

"There's no evidence that milk as part of a normal diet is harmful but there's some evidence that prolonged exposure to milk at night can produce decay, so only water should be drunk at night after the age of one."

Snacks should be chosen carefully, said Prof Welbury.

"Pre-school children often have small appetites and need regular meals with snacks in between. These snacks should be nutritious but low in added sugars to prevent tooth decay," said Prof Welbury.

"If you have three snacks a day and they are all sugar then you are going to get decay, there's no question about it."

Snacks to avoid include:

- soft drinks
- sweets
- chocolate
- chocolate and cream-filled biscuits
- sugary pastries
- sugary desserts
- highly sweetened cereals
- sugary sticky yogurts



Recommended snacks include:

- mouth-sized chunks of fruit
- raw vegetables
- toast
- mini-sandwiches
- pitta bread
- bread sticks
- oatcakes
- natural yogurt or fromage frais
- muffins
- low sugar breakfast cereal

Prof Welbury stressed that if these measures are used it is perfectly possible to 'break the cycle' of dental decay.



He presented evidence from a study in Sweden in which preventative measures offered to antenatal women and young infants and children had increased the percentage of three year olds who were free of caries from 51 per cent to 94 per cent and the proportion of caries free five year olds from 27 per cent to 72 per cent¹⁶. In 12 year olds the number of decayed or filled tooth surfaces decreased from six to one. In all age groups caries were reduced by 75 to 90 per cent.

Scotland is now attempting something similar with tooth brushing schemes and healthy eating initiatives with daily fruit and water as opposed to other drinks in all nurseries, said Prof Welbury.

HOW TO ADVISE ON HEALTHY EATING FOR TODDLERS

You have offered the parents the latest evidence-based guidance, dispensed all the appropriate leaflets and taken the child's necessary measurements. Now comes the dreaded question.

"So, what exactly should I be feeding my child?"

For frontline practitioners it is a question that can be almost impossible to answer.

Toddlers come in many sizes and grow at widely different rates. There are no national guidelines regarding specific portion sizes and data from the National Diet and Nutrition Survey shows that toddlers have a hugely varied intake.

Nevertheless, Elaine Farrell, nutrition and dietetic services manager at Colchester Hospital University Foundation NHS Trust, grasped the nettle and offered the meeting some simple, practical advice.

"It's quite difficult to give specific advice because toddlers vary in size. So you have to tailor your advice to particular families and children. You also have to remember that two year olds will grow 22 per cent of their body weight in a year. Three year olds grow 18 per cent. These are massive periods of growth so these children are programmed to eat."

A "normal healthy diet" for a toddler is higher in fat and lower in fibre than an older child's needs, said Ms Farrell. There should be a regular daily routine of meals and snacks with:

- three meals of toddler-sized portions
- two to three snacks per day
- six to eight drinks per day

The diet should include all of the five food groups:

- **bread, cereals and potatoes**
 - breakfast cereal
 - rice, pasta, couscous
 - potatoes, sweet potatoes, yam, plantain
 - bread
 - breadsticks, crackers, crisp bread
 - flour-based foods e.g. pancakes, chapatti
 - a mix of white and wholegrain
- **fruit and vegetables**
 - fresh, frozen, tinned and dried fruit
 - ideally, a variety of colours
 - cut up fruit
 - stir fry, bake or roast vegetables
 - add to pizzas, sauces and soups
- **milk, cheese and yogurt**
 - 120mls cup/beaker
 - pot yogurt/fromage frais or milk pudding
 - count cheese on pizza or in sandwiches
 - milk or yogurt on breakfast cereal
 - tofu
- **meat, fish and vegetarian alternatives**
 - meat
 - fish
 - eggs
 - nuts
 - pulses
- **foods high in fat and sugar**
 - oils, butter, margarine, cakes, biscuits, ice cream, sweets and sweetened drinks
 - give in addition to but not instead of other four food groups.

Ms Farrell stressed that parents should not worry if a child does not seem hungry at any specific meal.

"Parents often underestimate how much their child is eating. Remember the amounts toddlers eat will vary from day-to-day and meal-to-meal so you should judge intake over a period of a week or so rather than day-to-day. If a child is growing well then their diet is probably OK."

Finally Ms Farrell pointed out that concern over a child's eating habits should not be allowed to detract from the enjoyment of food.

"Food is not just about eating," she said. "There's a social side and family socialisation that's just as important as the taking in of food."

KEY LEARNING POINTS

- Young infants gradually develop tastes and food preferences that can last for the rest of their lives
- The earlier children are introduced to healthy foods the more likely they are to accept it
- The older they are introduced to lumpy foods the less likely they are to like fruit and vegetables
- Multi-agency intervention, involving health, education and childcare professionals, is required to tackle childhood obesity
- If you target families at risk early enough, you are more likely to reduce the risk of overweight
- Parents are more receptive to lifestyle advice in the early stages - when they are pregnant or have young children - and this is the time when health visitors are able to make a significant difference
- One in three obese three-to-five year olds will become obese adults
- If you are obese as a child then you are ten per cent more likely to die of cardiovascular disease
- If you grow too quickly in infancy you are at increased risk of obesity in later life
- There's a huge variation of body shape and size among children. For this reason specially adjusted BMI centile charts have been produced
- Omega 3 and omega 6 are the essential fatty acids. To strike a good balance between these in the toddler's diet:
 - eat more fish and seafood, green vegetables, nuts and seeds
 - eat less meat, dairy products, refined vegetable oil
- Studies have shown beneficial effect of fatty acid supplements in children with inattention, hyperactivity and disruptive behaviour
- Key influences that guide the way children feel about their weight are their family, the media, and their peers, the family is by far the most important
- Parents' own eating habits have a huge influence over how their children are likely to eat in later life
- Practices such as making children 'clear their plate', or using food as a reward for good behaviour, can also reinforce an unhealthy psychological approach to eating
- 44 per cent of children in the UK have dental decay by the time they are five years old
- Three preventative measures that can be addressed by everyone to prevent tooth decay are:
 - good brushing to remove plaque
 - use of fluoridated toothpaste to strengthen enamel
 - reducing the frequency and amount of sugar intake
- Brush teeth twice a day – once after breakfast and last thing at night, after which no drinks or food should be given
- A 'normal healthy diet' for a toddler is higher in fat and lower in fibre than an older child's needs
- There should be a regular daily routine of meals and snacks with:
 - three meals of toddler-sized portions
 - two to three snacks per day
 - six to eight drinks per day
- Remember the amounts toddlers eat will vary from day-to-day and meal-to-meal so you should judge intake over a period of a week or so.

All the Infant & Toddler Forum's educational resources are free to access or download from www.infantandtoddlerforum.org.

Factsheets:

Download / order Factsheets covering topics discussed here in more detail.

Toddler Dietary Assessment Charts:

Download charts to help record and assess what toddlers are eating and to know how closely this meets the recommendations for a toddler's daily and weekly intake.

Open Book On Growth:

Access 'Open Book On Growth', our new online educational resource designed to help healthcare professionals develop and update their skills and knowledge on child growth assessment as part of their continuing professional development.

General Information

- The Infant & Toddler Forum brings together representatives from paediatrics, neonatology, health visiting, dietetics and child psychology who share a common professional interest in infant and child health and nutrition
- A goal of the Forum is to improve the access of healthcare professionals to reliable, evidence-based nutritional information relevant to their practice, which will equip them to advise and support the parents of infants and young children
- The Forum is supported by an educational grant from Danone UK.

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