

# The problem of child dental care\*

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**I**N the United Kingdom facilities available for child dental care are among the best provided by any country. This, however, is all that is comforting about our present situation.

The sheer quantity of dental treatment required by our child population is so great that we cannot adequately cope. What is more, unless we have universal fluoridation within the next five or ten years and unless we rapidly speed up the training and utilization of dental auxiliaries, our ability to cope with the problem of child dental health is unlikely to improve during the next 30 years. There are many facets of child dental care but overwhelmingly our problems are concerned with treating the ravages of dental decay and correcting misfitting or irregular teeth. These two treatment problems are very different and are best considered separately.

## The problem of dental decay

Dental decay is not akin to the 'one off' diseases or to those for which there is a natural process of repair. Neither is it akin to any of the chronic metabolic disorders. It is in many ways unique in that it affects one site on a tooth at a time.

In most people this is a continual process, which begins almost as soon as the deciduous teeth appear. Wave after wave of attacks occur up to about the age of 35 years, when the impetus is almost spent. In our community, not all teeth succumb. There appears to be an individual ceiling of attack which usually is reached by 35 years and sometimes earlier.

On average only 25 teeth out of the total of 52 (that is 32 permanent and 20 deciduous teeth) ever succumb. The burden of this attack, however, falls heavily on the very young. In the average individual, almost half of the 25 teeth ever likely to decay throughout life have decayed by 12 years of age and about 75 per cent of them have suffered attack before the age of 15 years. These figures are for the average child; some suffer infinitely more than this. In my clinic it is not uncommon to find children with all their deciduous teeth decayed by three years, or children of 12 years with 21 decayed teeth. The problem is easy to define. In a large proportion of children the burden of treatment needed is beyond their emotional capacity. Indeed it is often beyond the emotional capacity of the parents.

The speed with which some teeth succumb is a continuous source of dismay and concern to many parents. For example, the first teeth of the permanent series are the first permanent molars of which there are four; these teeth erupt at about six years of age. Within 12 months of their appearance half of them have decayed; by 12 years of age 90 per cent have succumbed. The four second permanent molars which erupt at 12 years of age have this same pattern of rapid and intensive attack.

On top of this agonizing burden, each of these eight molar teeth is usually attacked more than once; at the same time other teeth of the permanent series are being attacked.

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The picture which I wish to convey is one of a continual series of caries attacks which occur from about two years of age throughout childhood and up to school leaving age.

To cope with each successive crop of cavities it is desirable to see a child every six months from two years to 16 years of age. On this basis the minimum number of inspections throughout this period is 28. Usually at least 20 other visits for treatment are necessary; this gives an average of at least three visits a year throughout childhood. If other treatment is needed, such as orthodontic treatment or if the child suffers trauma to the front teeth, a further burden of treatment is imposed. But it is rare for continuous treatment to run smoothly. Childhood illnesses, domestic problems of all kinds, the demands of schooling, apathy and positive resistance to treatment all contribute to the difficulties of providing continuous child dental care even if adequate treatment facilities are available. Throughout the country our treatment facilities are certainly not uniform. For instance, the National Health Service dentist:population ratio varies from 1:9,000 in Breconshire to 1:2,500 in the London area; the average for England and Wales is 1:4,600. There is a similar patchy distribution of the school dental service. In those areas where treatment facilities are good the record is reasonably good: in such areas at school leaving age about 60 per cent of all decayed permanent teeth are filled and on average only two teeth per child have been lost. But this only happens in those areas well provided with dentists: in those areas where the treatment facilities are relatively low, and there are many of these areas, the record is correspondingly less impressive. In all communities, however, the deciduous teeth are virtually neglected.

#### *Handicapped children*

So far I have considered the general problem of treating children, but there is a certain group of children for whom special treatment is needed and for whom special services are rarely provided. I am referring to those children who come under the general heading of handicapped. In this category are those who are spastics, those who are educationally sub-normal and those who for a variety of reasons are emotionally disturbed. Also within this category are included those with heart diseases, those with haemophilia and those who are broadly classified as delicate. At a national level we have no special priority services for these children and what treatment is given usually consists of extracting teeth as and when required. Mercifully their numbers are relatively small. In England and Wales at the present time, about 17,000 physically handicapped and delicate children are in special schools and about 7,000 are cared for at home. But the total group of handicapped children in the United Kingdom who need special dental care has been estimated at about 80,000. Whereas this constitutes just less than one per cent of the total school child population, individual and administrative problems concerned with the treatment of these patients are considerable. Satisfactory treatment can only be given under a general anaesthetic. Approximately only two or three of these children can be treated per session and hospitalization is often necessary. Dental fitness in these children, as in healthy children, is a transient phase and to provide a continuous form of treatment often demands repeated anaesthetics which, for many of them, is not advisable. The problem of the handicapped child is just a special aspect of the total problem, which, putting it simply, is too much disease at too early an age.

#### *Fluoridation*

The tragedy is that for about 30 years we have had the knowledge to resolve this problem, if not completely, to a very large degree. We know how to reduce the volume of dental decay in childhood by about 50 per cent both in normal and in handicapped children. The method is cheap, it is safe, it demands no effort on the part of the individual; its efficacy is guaranteed. I am referring to the addition of fluoride to drinking water. If 15 years ago all piped water supplies in the United Kingdom had been fluoridated, school

leavers this year would, on average, have suffered only seven decayed teeth instead of the present number of 15. Further, the number of attacks per attacked tooth would be very much less and the need for restorative treatment would have been reduced by almost 60 per cent.

The problems associated with the implementation of fluoridation are well known. Some of those who oppose fluoridation state that there are other equally effective methods of preventing dental decay; among these methods are included the use of fluoride toothpaste, of fluoride rinses, fluoride tablets and the adding of fluoride to milk. The effectiveness of these methods just cannot be compared with that of adding fluoride to drinking water. We have no other proven method of effectively preventing dental decay on such a large scale, and it is because of this that the problem of child dental care is so intimately involved with the problem of fluoridation.

Effective though fluoridation may be, it does not prevent all types of decay to an equal degree. The biting surfaces of molars and premolars are fissured surfaces and these are the surfaces most frequently attacked by dental decay. The other surfaces are smooth surfaces which are less frequently attacked. Fluoridation prevents caries on fissured surfaces by about 30 per cent and on smooth surfaces by about 80 per cent.

#### *A seal for fissured surfaces*

If we had some other method by which attacks at fissured surfaces could be further reduced we could make visits to the dentist for fillings a relatively rare event. For some time considerable research has been directed to finding a material which would stick to the tooth and which would block out or seal the crevices of fissured surfaces. By this means clinical dental caries would be prevented at these sites.

Considerable optimism has been aroused by the recent development in the United States of such a material. Recent reports of trials have been highly encouraging and it would appear that biennial applications give almost 90 per cent protection. Each application involves little more than ten minutes of surgery time. The process is painless and simple.

It is difficult to assess the full benefits of new technological developments of this kind, but if the findings of recent reports can be further substantiated then it would appear that we are at long last moving towards a situation in which the problem of dental decay in children is very largely solved. I have calculated that this new technique, if successful as claimed, together with water fluoridation would mean that throughout the lifetime of an average child, only three or four teeth would ever need to be filled, compared with 17 at present. Further, most of these three or four teeth escaping the preventive net would be attacked only once.

#### *Dental auxiliaries*

Child dental health is unlikely to improve over the next 30 years unless we have universal fluoridation within the next five to ten years and unless we speed up the training of dental auxiliaries.

About 50 years ago the dental profession in New Zealand realized its inability to provide an adequate dental service for children, particularly those living in the small isolated towns scattered all over the country. The New Zealanders solved this problem by training girls of 18 years to fill and extract teeth in children. The course of training was two years. They were called dental nurses. That they are still being trained and that 90 per cent of all New Zealand children currently receive treatment at the hands of dental nurses is abundant proof of their success.

We have a similar problem in this country. As we are unable to produce enough dental surgeons and because of the gradually increasing population we shall, in the

year 2,000 A.D. have a dentist:population ratio which at best will be only fractionally better than it is today or as it was in 1932. If the demand for dental treatment increases as it is most certain to do, both absolutely and proportionally, our dental services will soon be stretched beyond capacity. This will have dire effects on the provision of dental care for children.

In this country 12 years ago we began, on an experimental basis, a training scheme similar to that operating in New Zealand. The experiment was a success and we now produce 50–60 dental auxiliaries each year. The dental auxiliary qualifies after two years of training and following registration with the Registrar of the General Dental Council she can practice under the supervision of a dental surgeon either in a hospital or in the school dental service. A dental auxiliary is allowed to carry out simple fillings and to extract deciduous teeth. In my opinion she has a vital role to play in the provision of child dental care. Even now 80 per cent of all restorative treatments needed by normal children are well within the capacity of the dental auxiliary. If we did not have the potential weapons of fluoridation and occlusal sealants we would need a substantial number of dental auxiliaries to assist us in providing an adequate dental service for children. Now that we possess these potential weapons the problem is much easier but we still need auxiliaries. The technique of applying occlusal sealants and the restoration of what few simple cavities would occur do not require the skill and knowledge of a dental surgeon trained over a period of five years. These functions are well within the capacity of our present day dental auxiliary and these are the functions for which she is specially trained.

#### *School dental services*

In the school dental service we have a structure well suited for the delivery of a dental service of the kind which these developments would permit. But the days of the school dental service as we know it are numbered. The present government and the previous Labour government have made a decision to remove all treatment services from local authorities. We do not know what kind of service will replace the school dental service. I suggest that it could be replaced by a child dental health service financed and controlled separately from the general practitioner service. This service could provide all the specialist and general treatment services needed for children although, of course, parents would still have the option to take their children to a general practitioner.

I have outlined a scheme whereby the problem of dental decay in children could be solved. But there is still the problem of treating those children with misfitting or malaligned teeth—the problem of malocclusion.

#### **The problem of malocclusion**

Correcting irregular or misfitting teeth is called orthodontic treatment. The optimal age for starting this form of treatment is 11 years: most treatments can be completed within two years.

The form of treatment usually involves the extraction of some permanent teeth and fitting an appliance which may either be removable or it may be cemented to the teeth themselves and hence it is not removable.

About 70 per cent of 11 year old children need orthodontic treatment of one kind or another but half of them can be treated by the judicious extraction of teeth. Thus about 35 per cent of 11 year old children need what we call appliance therapy. Of those who need treatment the demand rate is not high; it is in the order of 27 per cent. In the London area the demand rate varies between 37 and 41 per cent: in Leeds and Newcastle it is about 17 per cent. Only one in eight of children receiving orthodontic treatment are treated by the school dental service.

### *Timing the treatment*

Since 1956 the demand rate has doubled and there is every indication that the demand rate will continue to increase. This form of treatment, however, demands considerable co-operation and patience on the part of the child and much encouragement from parents and teachers. Not all children can submit themselves to the discipline required or to the temporary disfigurement which some appliances impose. Out of every six children wearing orthodontic appliances, one fails to continue with treatment.

Usually we cannot start earlier than 11 years because insufficient growth and development has taken place, but if we can and if we do start orthodontic treatment at an earlier age we simply extend the duration of treatment. To delay beginning treatment beyond the age of 11 years often leads to complications. Most of the demand for orthodontic treatment comes from homes of Social Classes I and II and most of the children in this group are at schools where they are studying for their 'O' level examinations. At ages of 14 years and above, parents, teachers and children themselves are reluctant to have the educational routine disturbed: at this critical phase in a young child's life continuous orthodontic appointments, every 4–6 weeks at the minimum, are not welcome. In addition, children of 14 years are generally highly self conscious and for many of them the wearing of an orthodontic appliance is a social embarrassment. These are the reasons why the optimal age for orthodontic treatment is about 11 years.

Unfortunately, the vast majority of malaligned teeth cannot be prevented and the volume of treatment needed is a constant proportion of the child population. At one time it was thought that fluoridation through its ability to diminish premature loss of deciduous teeth would substantially reduce the need for orthodontic treatment. We now know that this is not so. In a non-fluoride area the extraction of teeth for orthodontic reasons is often dictated by the extent of decay and not by the criteria of clinical judgement: this often complicates and prolongs orthodontic treatment. This situation is largely eliminated in a fluoride community. The problem of orthodontic treatment is, different from that created by dental decay. Nevertheless it is another burden of dental treatment imposed upon many a young child.

### *Children with cleft palates*

Within the group of children needing orthodontic treatment there is a sub-group which requires very special care. This sub-group consists of children with cleft palates and hare lips. Early surgery and early orthodontic measures can prevent and minimize some of the abnormal developments which would otherwise occur in these children. Early closure of the lip and a reconstruction of the palate is routine. This treatment can be facilitated by pre-surgical orthodontic treatment and here the assistance of an orthodontist is important. But a complete reconstruction is not always possible and children with clefts usually have complications which eventually require skilled orthodontic treatment. This kind of abnormality cannot be prevented, but the added burden of dental decay in these children can be vastly reduced by the measures I have stated.

### **Conclusions**

I am hopeful that the old prejudices against fluoridation will gradually disappear, and that by the mid-1980s—perhaps earlier—the bogey of dental decay in children will have largely disappeared. We shall then be in a better position to provide an orthodontic service to meet the anticipated increase in demand.

For many years the problem of child dental care has been a major public health problem. It still is. But now we have the knowledge and the techniques to improve beyond all recognition the dental health of the child population of this country. How speedily we move to this end depends on how quickly the community can rid itself of prejudices against fluoridation, on the speed with which we can train and accept more auxiliaries, and on how swiftly we can establish a service of excellence designed specifically for children.