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PREVENTION AND CONTROL
OF DENTAL CARIES
IN CHILDREN

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A Thesis submitted in
partial requirement for the
Diploma of Public Health (Dentistry)

Department of Preventive Dentistry
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University of Sydney
1970
This thesis is dedicated to children in whose hands lies the future.
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F. I. Haque
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INTRODUCTION

Until recent years, the noteworthy achievements in dentistry were considered to be some fine and elaborate techniques and procedures concerned primarily with the cure of conditions of disease already present, and the repair of the damage suffered by the tissues due to the disease or otherwise. There did not seem to be any far-sighted approach to prevention and eradication of the conditions predisposing to disease.

However, recent developments appear to be changing the entire complexion of dental practice. Whereas, previously, dentistry was just an art, it is now becoming a science too.

According to Bernier, far-sighted dentists contemplate a day when all diseases will be largely eliminated and the hand-piece and forceps will merely be "incidental symbols of the profession". But even now, there are such sceptical members of the profession who consider devoted concern to prevention of dental disease an unrealistic goal. (1)

Even before all modern methods of treatment and
prevention of disease were known, man was conscious of safeguarding his health. The fear of death and love for life have always motivated man to such measures as would safeguard him against disease, preserve health, give him greater strength and prolong his life.

In the primitive races, the witch doctor has been expected to ward off all evil which includes diseases. They have all sorts of ritual dances and taboos either for curative or preventive purposes.

In the more civilized people, who have some concept of God, religion forms a strong motivating force which guides the manners and customs of its followers. The dogma thus introduced take such deep roots that even after thousands of years, they are adhered to though the philosophy behind them is either confused, misunderstood and even exaggerated in some cases. For example, the sacredness of the cow in the Indian Hindu religion was due to its health-giving milk and was inspired at a time when cows were slaughtered indiscriminately as offerings to idols. But today, even its dung and urine are attributed to health-giving and purifying properties and in many Hindu homes the kitchen is given a daily cow-dung wash.

Islam, the last of the religions prescribed by
the Lord Almighty for the human race shows a particular concern about personal and communal hygiene for preservation of health and prevention of disease. The Islamic dictates have three different sources:

(i) The Holy Quran which is the Word of God Almighty as revealed to the Holy Prophet Mohammad (May the peace and blessings of God be upon him). He had the words written down in original, without any comment, explanation or modification. The text is as original as it was 1344 years ago when the religion of Islam began.

(ii) The saying of the Holy Prophet himself preserved in the form of books called the Books of Hadith, and

(iii) The doing of the Holy Prophet that are referred to as "Sunna" and are preserved both in the form of books and also traditions. He demonstrated by his practices every word of what he preached.

I would like to give a few quotations in Arabic from the Holy Quran with their translations and a few of the sayings of the Holy Prophet Mohammad (May the peace and blessings of the Lord be upon him) which relate to oral hygiene, personal cleanliness and communal hygiene. From the Holy Quran:

Transcription
InnAllahe yuhibbul tawwābina wa yuhibbul mutataharina

Translation
Indeed, Allah loves those who turn to Him and He loves those who keep themselves clean.
(Chapter 2, Verse 223).

2. Chapter 68, Verses 5 and 6.

Transcription
Wa thyabake watabia. Warujza fahir

Translation
And your dress be clean,
And uncleanliness do thou shun

3. Chapter 2, Verse 169

Transcription
Kuloo mimma fil arde halālan tayyiban.
Translation

Eat from what is good, health-giving and pure in this earth.


\[
	ext{كَرِّمَتْ عَلَى الْمَيَيْنَةِ وَالْمَيْدَةِ وَلَحْمَ النَّزِيرِ}
\text{What better things than water and milk and the blood of the}
\[
	ext{مَا أَحْلَّ إِلاَّ الْحَنْدَةَ وَالْمَسْحُورَةَ وَالطَّيِّبَةَ}
\text{best things to drink? Water and milk and the blood of the}
\[
	ext{وَالمَتَنَكَّرَةَ وَالْمُتَقَدِّسَةَ وَالْمُؤَمِّنَةَ}
\text{shiny and the consecrated and the pure}
\[
	ext{وَمَا كَلَّ السِّبْعَ الَّذِيَ أَنْصَرَهُمُ}
\text{and the seven who have been supported}
\[
	ext{أَلَّا يُبَشِّرُونَ}.
\text{and blessed.}
\]

Transcription

Hurremat a'laikumul maitata wa lahmul khinzira wa ma ohilla leghairillahe bihe wal munkhanegato wal manquzato wal mutaraddiyato wan-natihato wamasy-akalaas sabae illa ma zakki'tum.

Translation

Forbidden to you is the flesh of an animal which dies of itself, and blood and the flesh of swine, and that on which is invoked the name of one other than Allah; and that which has been strangled; and that beaten to death; and that killed by a fall; and that which has been gored to death; and that of which a wild animal has eaten, except that which you have properly slaughtered.
5. Chapter 7, Verse 32.

\[
\text{بابيّةَ أَبِيُّ ادَّمَ خُذُواَ زِينَتَكُمْ عَنْدَ مِسْجِدٍ وَكَلْرَاء}
\text{كَاشْرِبُواُ فَلَا تَشْرَبُواُ إِنّهُ لاَ يَجِبُّ الْمُشْرِقِينَهُ}
\]

Transcription
Yahbani Adam khuzu zinatukum inda kulle masjidin wakulu washrabu. Innaha la yuhib bal musrefein.

Translation
O children of Adam, take care about your cleanliness and adornment at every place of congregation, and eat and drink with restraint. Surely He does not love those who exceed the limits.


\[
\text{يَا أَيِّهَ الْمُؤْمِنِينَ اْسْتَرْطَبُواْ إِلَىَّ الصَّلَاةِ فَاغْسِلُواْ}
\text{وَجَعِفْطُواْ أَيْمَاكُمْ إِلَىَّ المَرَاضِيِّ وَاْسْتَوْهُواْ بِرَوْسُلَنَا}
\text{وَأَنْجِلُواْ إِلَىَّ الْعَبَيْنِ وَأَنْحَأْ مَنْ بَنَىَ فَاطَّرُواْ}
\]

Transcription
Ya-aiyyohal-lazina amanoo wa iza qumtum il us-salate faghsalu wdu-hakum wa aizekum junaban fattaharu.

Translation
O ye who believe, when you stand up for prayer
wash your faces, and your hands up to the elbows, and pass your wet hands over your heads and wash your feet to the ankles. And if you be unclean, purify yourselves by bathing.

I would like to mention a few of the sayings of the Holy Prophet Mohammad (May the peace and blessings of the Lord Almighty be on him) and what has been said of him by some of his contemporaries from the Hadith. These narrations mostly relate to the cleanliness of the teeth.

1. The Holy Prophet said: "There are two great blessings of the Lord, the value of which man is liable to ignore, one is health and the second, time for leisure". (In Bukhari by Ibne Abbas).

2. "Staying neat and clean is also a part of religion." (In Muslim by Asghari).

3. "Save yourself from doing two accursed deeds; spreading filth and rubbish on the streets and in the shady places where people sit, rest and relax". (In Muslim by Abuhorerah).

4. "Mosques and public places are made so that the Glory of God be sung in them and His Word, the Holy Quran be recited in them. These are not
meant for people to answer their calls of nature or for throwing around rubbish". (In Muslim by Anas).

5. "Ten things should be part of human nature.
   i) Trimming the moustache, ii) growing the beard, iii) cleaning the teeth with "Miswak", iv) washing the nose with water from inside, v) cutting the nails, vi) keeping the fingers clean, vii) removing hair from the armpits, viii) removing hair from the perineum and ix) washing with water after urination and defaecation". The narrator who was the wife of the Holy Prophet, has said that she is not sure of the tenth one but she writes that probably it was gum massage (In Muslim by Aishe).

6. "If you heard that there is an epidemic in some place, do not enter that place. And if you find that there is an epidemic where you are, do not leave that place". (In Muslim and Bukhari by Osama Bin Laid).

7. "Keep your utensils covered". (In Muslim by Jabbæ).

8. "The houses should be made in such a manner that there is plenty of light and air". (Ismail M. Al-Fazal 19/56 8th Nov. 1931.)

9. "Standing water should not be polluted, and he who does it should be punished". (Same ref. as for No.8).
10. "Stray dogs or rats should be destroyed". (Ref. same as for No. 8).

11. "Those who keep their houses, do not let their drains remain dirty, wash their clothes, use tooth-picks and Miswak (Toothbrush) to clean their teeth, keep their bodies clean and avoid stinks and smells usually do not suffer any dangerous diseases." (Khazamatuk-Urfaan).

Miswak was the toothbrush of those days. It was either a green stick from trees like acacia or a fresh or dried root, usually from a quarter to half an inch in thickness. It was shredded at one end by chewing and thus acted like a brush. The tannic acid and other juices from the miswak probably had a medicinal effect.

There has been considerable discussion recorded on the manner of brushing as well with the miswak. Some insist that the movement should be vertical while others advocate a horizontal stroke, and yet there are others who suggest that it should be "from the gums towards the edges of the teeth. (In Neelul-ul-Antae, vol. one, page 103).

The foregoing paragraphs go to show that concepts of oral cleanliness, personal hygiene and
public health were present and always have been present for centuries. The modern age with its modern methods and equipment has given and is still giving these concepts a scientific aspect. Talking of treatment, from times immemorial, the only scientific cure people could think of for their teeth was extraction. Later, there were methods for treatment and now there are methods for prevention.

This thesis is devoted to the control and prevention of dental caries in children in particular. My aim would be to try as far as possible to give a brief and precise account of methods of control and prevention for children. I shall also have to discuss handling of a child and dental health education which are apparently important aspects of prevention.

Preventive dentistry has also been referred to by other names, Public Health Dentistry and Social Dentistry. It largely deals with the problems of groups and populations and since the thesis is devoted to children, it will be children who will form the group of population for describing the various aspects of patient care.
Section 1.1  Philosophy and Meaning of Prevention

True prevention can be defined as keeping the teeth and their supporting structures completely free of dental decay.

A series of actions is required for ensuring the proper care of oral health of a patient. If this series of actions is properly co-ordinated into a plan designed to reach a single goal, namely optimal oral health, it would act as a basis for a philosophy of preventive dentistry. This philosophy of preventive dentistry certainly gives meaning to the practice of dentistry particularly to pedodontics. As previously mentioned in the introduction, it brings to the forefront the science of dentistry without detracting from the art involved in dentistry.

As Bernier has rightly put it:

In assessing the oral health problem of a patient, the dentist need only ask this question of himself, "What will be the total oral health status ten years from now, after I have finished the multiple procedures that must be performed now?" If one considers the insertion of a restoration, the replacement of missing teeth or the extraction of a tooth as an individual accomplishment — an end in itself — then the total health of the patient is not being served. This means that the
operator is concerned with the reparative procedure itself, and not in the long-range effect in preventing disease. (1)

This would go to show then, that our actions would not follow some analysis of the real problem. Whether the analysis be superficial or deep and penetrating, its intent would be to rationalise the actions we perform. This would be one way to develop and maintain a philosophy or a definite and genuine reason for our actions.

Bibby in his article "Do we tell the truth about preventing caries?" has very humorously mentioned that to many dentists the "Triad of Oral Hygiene, Proper Diet and Regular Visits to the Dentist has almost achieved the status of a Holy Trinity which will keep away the Devil of Dental Decay from those who believe in and follow it". Each of the above, that is, visits to the dentist, faithful toothbrushing and proper diet, serves a useful purpose. But none of these is known to completely prevent dental decay. There has as yet been little research done and no promotion from organisations with greater resources than at the command of dental associations and their commercial dentifrice manufacturers which could publicize alternate
ideas.

Nevertheless, neglect of these measures which form at best a part of prevention of dental decay could negate much of the benefit resulting from the use of fluorides. (2)

Section 1.2 Attitudes of the Dental Profession.

It has been observed that the reaction of the dental profession to this new philosophy of preventive dentistry is of a varied nature.

Those practitioners who have a very established practice, would find it difficult to make changes in the format of their existing practice. Nevertheless, there are quite a few who are sincerely making the effort and are succeeding.

However, there are still others in the profession who do not even attempt to make an effort for change in their dental practice. Their method of practice seems to be a tradition to them which they feel they are almost incapable of giving up. The long-standing practices feel it is too late in the day for change in their format. It is this core of the professional practitioners that need to be convinced if preventive
practice is to become a meaningful reality.

Of equal importance are the recent graduates who are convinced by this philosophy only if the members of the dental faculty who teach them are not only thoroughly convinced but believe in it and practise it. Because it is in the school of dentistry that the student receives the right philosophy of dental practice, it is essential that the institution must have its entire teaching efforts permeated with the concept of prevention. It is then only that the student will realise and appreciate the true value of prevention.

The conscientious dentist however, to the best of his abilities, endeavours to provide a good professional service. He has the oral health of his patient in mind and genuinely values it. He therefore makes sincere efforts to encourage good dental practices and good oral hygiene in his patients. The pedodontist goes a step further by giving all the necessary instructions for good dental health of his child patients to their parents as well, in order to emphasise its importance and value. But he is then quite understandably astonished and puzzled when he has to contemplate the apathy of the great bulk of the population to their oral health problems. Though this
problem is of a complex nature, and he recognises its complexities and the variety of factors influencing the general situation, he naturally feels that the problem is a manageable one if some direct action is taken towards it. Most dentists even assert with a degree of confidence a number of separate and dominant factors as casual despite their recognition of the complex nature of the problems.

Often there are certain positive experiences in the history of child patients or their parents, that influence them against the dentist and dental care. Many children, on their first visit to the dentist, have not received appropriate care influencing them negatively to dental care and treatment. Other histories indicate that they have read or seen legendary comics or movies of dentists, or they may have experienced pain on their first visit. The dentist has often to face such a situation. Here many dentists who have a true, mental perspective of prevention and thoroughly practise it in all its aspects, may find it easier to solve the problems of their patients. They impart sufficient dental education to both their child and adult patients to ensure good oral health. But there may be others who think that
dental health education is not so much a part of their concern as of other external agencies, like the school, home, department of education and whatever governmental authorities that are invoked and should undertake the task of disseminating dental health education.

However insurmountable the problems and no matter what is done, a minority of the population is always prepared to seek dental care and achieve good dental health. If the dentist incorporates preventive measures into his practice, perfects his techniques and renders a good dental service, the dentally fit persons in the course of time would certainly be able to influence others who avoid dental treatment. In other words, a dentist should always aim to satisfy his patients who would prove a good advertisement for him.

Section 1.3 Philosophy of Prevention and its Application.

In spite of the fact that a philosophy or reason for action may be necessary, there is always a firm need for its implementation to be practical and feasible. The philosophy of prevention of dental decay therefore calls for an implementation or practical application of the philosophy. Treatment planning is the first
stage of this implementation.

  Bernier (1) has suggested three phases for treatment planning. They are: 1) Urgent, 2) Prophylaxis and Anti-Caries Therapy and 3) Counselling in Self-Care.

1) Urgent - It is always advisable to give a thought to decide what is to be performed urgently for the patient. Any emergency treatment or treatment deemed necessary to prevent the early development of an emergency condition should be performed first and should always be given top priority. If pain exists, it must be controlled by any method deemed desirable by the dentist. As far as possible, the dentist will and should always endeavour to save the tooth. In a child, premature extractions of deciduous teeth may later call for orthodontic problems.

  Considerable flexibility must be inherent in developing a plan for dental treatment.

2) Prophylaxis and Anti-Caries Therapy - Where there is no urgency for any surgical procedures, a periodic dental prophylaxis should be considered an important therapeutic measure for all children. The application of stannous fluoride coupled with complete dental prophylaxis should be carried out at this time.
Very often pulp therapy or root treatment for an exposed deciduous or permanent tooth may be necessary. This should as far as possible not be avoided as every attempt to save the teeth should be made. If however a permanent tooth is about to erupt and its deciduous precursor is exposed and the child is in pain, the dentist should not hesitate to extract the tooth. When faced with an acutely or chronically non-vital abscessed deciduous tooth, adequate antibiotics should be administered to the child before any interference with pulp therapy or root canal treatment.

3) Counselling in Self-Care — This is a phase which needs continuous attention throughout the entire course of treatment as there has almost always been evidence of inadequacy of self-care. This inadequacy in self-care is usually due to lack of proper instructions and motivation, and obviously emphasises the need for early instruction and motivation for improvement. This must begin with the first visit and continue throughout the period of patient care, and into recall periods. It should be a complete educational programme in oral health, carefully and diligently carried through for the patient. The parents of the child patient should always be part and parcel of this programme.

The instructions for oral hygiene should include
the use of disclosing wafers which apart from assessing the child's accomplishment would no doubt fascinate him.
PART TWO

INCORPORATION OF PREVENTIVE DENTISTRY IN A PEDODONTIC OFFICE PRACTICE
Section 2.1 Examination and Diagnosis

The incorporation of preventive dentistry into a pedodontic office practice involves not only examination, diagnostic procedures, dental prophylaxis and prevention treatment, but other subtle features too, which are essential for receiving a child patient into a preventive clinic. Care must be taken at the first visit particularly because it is at this visit that the child retains lasting impressions of a dental office and the dentist. Other subtle features also consist of the set-up of the clinic and waiting room which also promote towards forming a good impression on the child's mind.

To make a child patient comfortable and welcome, the very sight of the whole set-up must be most appealing to the child. A children's corner or a little alcove should be considered for a pedodontist's reception room. Two or three chairs and a table of a child's size would make the child-patient feel comfortable and quite at home. If sufficient room is available, a few toys, a little rocking chair or a hobby horse may be placed in the children's corner. Any decor familiar to a child, for example, Mother Goose or Snow-White and the Seven Dwarfs or Walt Disney's characters on the walls would
further reinforce the feeling of comfort for the child. Little story books can be placed in an accessible place. Also small pamphlets with coloured pictures and easy-to-read literature in preventive dentistry, for example, types of food a child should eat, importance of oral hygiene and methods of brushing, "swish and swallow" and something about fluorides should be provided for the child patient and his parents to see during their waiting time.

Before seating the child for examination of his dental tissues, it is advisable to greet the child by his first name and crack a joke or two with him about something which may be familiar to him. This would draw the child closer to his dentist who would start winning the child's confidence at the very outset. (3)

Regular routine examination which should be very thorough and complete with a recording done on an examination chart should be carried out.

The importance of both visual and radiographic examinations is well appreciated by the pedodontist or the general practitioner attending to children. For arriving at a correct estimate of a carious condition or even for determining the presence of dental caries both these methods of examination form an essential means for diagnosis. But regardless of how well these
procedures are carried out, we still cannot determine in most cases the "why" of the problem. Most patients are highly susceptible to dental caries and are very concerned about their problem. For children with rampant caries, it is essential to carry out certain caries-activity tests. Children with active caries conditions or histories of high caries who are to receive some sort of fixed or removable appliances for orthodontic treatment or those who do not respond to routine office education and home-care treatment also need these tests.

Multiple caries activity testing is significantly more diagnostic than the use of any single test. If not carried out as a routine procedure, it is absolutely essential for cases where caries activity testing is definitely indicated. Each case usually presents certain challenging and undeterminable problems before testing is begun. But there is one great advantage amongst others, that in virtually all cases who have caries activity testing, patient education efforts have been strengthened as these are highly motivating experiences and carry dramatic lasting effects. Response to suggested home-care and recall programmes is keenly observed.

Suggested tests include disclosing Wafer test,
glucose clearance test, modified breath test, Snyder test, lactobacillary plate count determination, Green Test and salivary flow determination.

These tests according to Mercer form "a well-coordinated programme of office caries activity testing with maximum simplicity of procedure and minimum involvement of time and expense. (4)

Section 2.2 Topical Fluoride Therapy

After a complete examination, both visual and radiographic, has been carried out for the child and the caries activity testing done if indicated, and a diagnosis obtained and recorded, thought then should be given to the planning of treatment.

Treatment can only be planned on the basis of diagnosis and knowledge of what type of care the patient would require. If urgent treatment is required, for example, elimination of pain if present, should be first attempted to completely satisfy the patient and to give him relief of his foremost complaint. After urgent treatment is completed, regular treatment, both preventive and operative for thorough dental prophylaxis may be commenced.

When an accurate determination of the caries condition of the child patient has been made, not only
should the caries condition be treated, but a complete procedure of dental prophylaxis be carried out. Before sending off the patient, the application of a prophylactic paste like Zirconium fluoride paste followed by topical application of stannous fluoride 10% does ensure substantial caries prevention.

Brudevold in his article, "Caries Control by Topical Treatments and by the use of fluoride dentifrices" has observed that stannous fluoride has a claim of superiority over sodium fluoride "but even in regard to this fluoride it has become increasingly evident that there is no cation effect and that fluoride and not stannous tin is the effective component"(5) Brudevold et al., 1966);

After the original observations of Bibby, Knutson and others, that applications of sodium fluoride reduced caries, it was thought that the anti-caries action of fluoride could be augmented by cationic agents. This hypothesis led to the use of such fluorides as stannous fluoride by Howet et al., in 1955, lead fluoride by Galagan and Knutson in 1947, and zirconium fluoride by Fjaestad-Sager et al., in 1961. It was hypothesised that the relatively insoluble precipitates formed in the enamel by these cations would add to the protection against caries afforded by fluoride.
According to Brudevold, the validity of this concept is now questioned by several investigators. Again, Brudevold mentions that though exhaustive studies on the effect of fluorides like lead fluoride, iron fluoride and zirconium fluoride have not been done, the findings clearly indicate that these fluorides are not more effective than sodium fluoride. Only in the case of stannous fluoride, he says as mentioned earlier has a claim of superiority been made, though at the same time he has even refuted the effect of the cation.\(^{(5)}\)

As stannous fluoride does have a superiority over sodium fluoride, it is routinely used for all topical administrations and in most fluoride dentifrices.

After a complete dental prophylaxis is done for the child, a prophy paste like the zirconium fluoride paste is applied on all the surfaces of the teeth. Children would love it as it has a very pleasant flavour and a sweetish taste. This paste is followed by a topical application of stannous fluoride 10\% - The child is instructed not to take anything by mouth for the next thirty minutes.

Periodic topical applications of stannous fluorides give substantial prevention of caries. Even incipient caries can be arrested by stannous fluoride which causes a dark brown staining of the subsurface
decalcification. This staining becomes lighter in colour in due course which explains for another topical application. By far the maximum uptake of fluoride is considered to be its topical application to the teeth.\(^{(29)}\)

Muhler has suggested a multiple fluoride therapy which seems to be an ideal form of preventive treatment for dental caries. He believes that the combined use of three agents containing fluoride: a prophylactic paste, a solution and a dentifrice would give a higher percentage of reduction in caries incidence\(^{(6)}\). Of course, as mentioned the first two, the prophylactic paste and solution (SnF\(_2\) 10\%) are applied by the dentist but the use of a fluoride dentifrice is part of home care and advised during direct patient education.

Section 2.3 Patient Education

Patient education is the core of a total preventive programme for a pedodontic office. Opportunities for education are available at every practice and procedure of preventive dentistry. Motivation of the patient to assume positive and responsible attitudes towards establishing good oral and dental health should be the primary objective of patient education. This primary objective is easily
accomplished if the dentist can provide for his patients satisfying and pleasant experiences.

Mercer(4) has pointed out that patients exposed to caries activity testing and diet counselling experience the best in preventive dentistry procedures and are more likely to show a favourable response to education in a manner parallelizing the scope of their experiences. Similarly, he has said that patients who have undergone a dental office audio-visual education may be expected to react in relation to their educational experiences.

If efforts to establish good relations with patients are made, and sincere attitudes of concern, understanding and friendliness are demonstrated by the dentist, not forgetting his professional work at its best, goals of patient education can be accomplished easily.

The pedodontist or general practitioner attending to children is often criticised for his insistence on discipline during treatment procedures. But all parents are not critical, they understand that children are even otherwise more difficult to handle and treat than adults, and certainly appreciate that discipline on the part of the child goes a long way for better treatment and easy handling. This goes to show that
these parents do exert a similar discipline at home. But there are others who would be only relieved to hand over and leave the child to the dentist to manage. Most children are good patients, respond well to patient education, and often are a pleasant relief in a busy, demanding schedule in general practice. (7)

Many of the problems in patient education of a child and his handling and treatment procedures may be parent-oriented. But many may be even due to lack of interest on the part of the dentist. And Seyler very rightly has mentioned in an editorial of the journal of dentistry for children that "the development and encouragement of parental cooperation in our efforts is only the facet of our programme albeit a very important one." (7) For a dentist must be interested in and be able to provide proper dental care in all of its ordinary and normal areas of preventive dentistry.

Methods of patient education can be divided into two categories:
1. Direct Education, and
2. Indirect Education.

Under direct education, would be discussed briefly three aspects:
(1) Nutritional Counselling
(2) Use of Fluoride Dentifrices
(3) Oral Hygiene.

Indirect education will be discussed briefly with a mention of the modern methods and equipment used for it.

2.3.1 Direct Education

This is considered by most dentists as the most effective form of patient education. Tremendous advantages are gained by face-to-face and eye-to-eye contact than by other forms of communication.

The dentist is entirely responsible for direct education of his patients. If any instructions or education are imparted by the auxiliaries, it should be in coordination with the dentist's instructions to be really authentic.

Most important and effective means of direct education are the caries activity testing which has been mentioned previously and diet counselling which will be discussed under "Nutritional Counselling". Besides these, other direct patient education opportunities, such as instruction in toothbrushing technique, or demonstrating the use of dental irrigators are invaluable means for relating office treatment and experience to the patient's home-care programme. Visual aids, models and photographs are of great general help
in providing understanding and clarity to the dentist's communications. The patient's own radiographs, study models and photographs as well as histories of other work accomplished by the dentist are among the most important visual aids.

Direct patient education depends upon the teaching ability of the dentist. It is accomplished more easily and successfully if the dentist possesses the basic skill for teaching. He should be able to instruct and motivate his patients to carry out his instructions. According to Bernier, (1) the basic concepts of education and motivation must be taught to the dental student for him to have the necessary tools for patient education. (1) This should be part of his dental curriculum. As the philosophy of prevention is becoming more and more prominent in most institutions, dental health education is also becoming a part of their curriculum.

A programme for the direct method of patient education should be preferably prepared in advance for the patient. The areas in which the patient needs education assistance should not only be considered as a separate entity but in relation and in coordination with the treatment procedure. Every effort should be made to see to this latter aspect of the programmed education.
Random patient education by the dentist or his assistants at chair-side or during "in-between" moments, as Mercer has put it should be constructive. The entire office team should be conscious of its role of providing a continuous office atmosphere of learning and motivation in order to enhance the patient's understanding of good dental health.

2.3.1(a) Nutritional Counselling

Nutritional counselling is a difficult and delicate aspect of patient education. Eating habits have always been personal and intimate subjects to discuss with patients. With children, it would be interesting for them if their eating habits were discussed with them by their dentist. Complete denial of sweets, for example toffees, chocolates and lollies would, in cases with low caries prevalence or no caries, be unfair to them particularly if they possess good oral hygiene habits too. However, in children with a high caries prevalence or high susceptibility to caries, or those with rampant caries, strict dietary measures imposed with utmost tact and care would certainly prove very beneficial in a preventive programme. If regular diet charts are prepared for them and they are made to strictly adhere to instructions given, the danger of
any further caries can be averted.

It is useful to consult with the child and parent and in all such interviews, a positive and constructive form of approach would be the most effective form of persuasion. If the patient is not able to accept any major changes made by his dentist, he should be at least encouraged and recommended a progressive revision of his food habits. Cooperation by parents forms a very important facet of nutritional counselling. However, if proper foundations of trust and confidence are established with the patient, the dentist can expect his patients to accept his suggestions regarding a diet revision and change. And if these suggestions are accepted when given from time to time, nutritional counselling can result in a loyal and lasting relationship between the child and his dentist.

A diet survey sheet, as mentioned earlier is essential for accentuating the meaning of the programme to the patient and could even provide a basis for recommendations. Moreover, a follow-up survey at the time of recall after a month or two would be easier with the survey and would even direct the attention of the patient further towards his food habits. As with the initial survey, sitting down with the patient and reviewing the chart would be an excellent idea to provide
further emphasis. At this time, any further problems or questions which arise could also be discussed.

Effective nutritional counselling would need a lot of time and energy. But if the dentist does wish his instructions to be properly understood by his patients, it is imperative for him to devote some time to this programme. For children, it would be better to carry out this programme not only by verbal instruction but by demonstrating some coloured pictures illustrating the various types of foods essential for good teeth. So it would be difficult and challenging but worth the challenge if continued counselling is done to achieve a successful outcome coupled with efforts to make the programme as interesting and picturesque as possible. Pamphlets with coloured illustrations should be plentiful in the office for children even to take home with them as they are leaving the office. This would not only make them happy, but more cooperative and understanding.

According to Gillings (8) recommendations regarding diet should be:

1. Avoid foods containing sugar, if not.....
2. Avoid sticky, sweetened foods, if not.....
3. Avoid between-meal snacks of sticky sweetened foods. Eat them ONLY at regular meal times.
4. Clean your teeth IMMEDIATELY after eating sticky,
sweetened foods, OR rinse your mouth vigorously with water or any suitable beverage if tooth cleaning is impractical.

5. Use fluoridated water or fluoride tablets."

These recommendations seem to be more practical for children in particular.

Suitable foods at between-meal snacks recommended by Gillings are:

- fresh fruits and vegetables
- meats and fish
- milk
- cheese
- plain white or whole meal bread and butter WITHOUT sweetened spreads.

It has been observed that dental caries increase when consumption of sweet foods is frequently introduced and decreases when such consumption is stopped. This constitutes convincing evidence that sugar increases dental caries activity in man. Also, when sugar is consumed in solution at meals very little or no carious activity can be observed. Sugar exerts its caries promoting effect locally on the teeth. These conclusions have been the results of the findings of the Lipsholm Study which was done in Sweden in a six-year period.(8)

The dentist must therefore make his patient
realise that prevention of dental caries depends not only on techniques in the surgery and community preventive measures like fluoridation, but also on preventive measures carried out by the patient himself. To carry out his preventive programme, the patient must be given the right knowledge and motivation. Only the dentist can effectively motivate his patients to adopt better dietary patterns and give him the most recent and reliable information available.

2.3.1(b) Use of Fluoride Dentifrices

The use of a fluoride dentifrice has already been mentioned in regard to multiple fluoride therapy suggested by Muhler and his co-workers.

The efficacy of fluoride dentifrices as a method of controlling dental caries have been demonstrated by various studies done in several countries. Several investigators, for example Finn and Jameson, Brudevold and Chilton, apart from several others, have observed the caries experiences of subjects using a fluoride dentifrice and those using a fluoride-free dentifrice. In comparing the results they found that the subjects using the test dentifrice had less caries than those occurring in the groups using the fluoride-free dentifrice. (9)
During tooth development, maximum protection against tooth decay can be achieved if optimal amounts of fluoride are contained in the water. The trace element becomes irreversibly fixed as fluorapatite in the mineralising tissues. And since fluorapatite is far more caries resistant than hydroxyapatite the tooth gets its maximum protection. Besides drinking water which is fluoridated and receiving topical applications of stannous fluoride, the patient should be instructed to use a fluoride dentifrice. Certainly the use of fluoride dentifrices contributes to the cumulative benefits by the other preventive measures such as dietary control, water fluoridation and regular dental care. (9)

2.3.1(c) Oral Hygiene

The value of oral hygiene in the form of tooth brushing has been underestimated in children. In general, children do not brush their teeth effectively enough to remove the destructive elements from caries susceptible areas. They do not brush even frequently or rather regularly, that is after every meal.

Brushing the teeth in the morning and at night before retiring more or less serves just cosmetic
purposes. But if children were made to brush immediately after the evening meal and after lunch too if possible or given an apple or carrot or any other detergent fruit or vegetable, the standard of oral hygiene thus achieved would be valued more. This also depends upon the age of the child. If the child is very young, toothbrushing should be done by the mother. If the child is old enough to brush himself and has just started to do so himself, his brushing should be supervised by the mother to such a time when he can be left on his own to brush effectively. As suggested in nutritional counselling, between-meal snacks should be either avoided or given in a form which does not adhere to the surfaces of the teeth. Sweet, sticky and adhesive eatables should not be given unless the child is made to clean his teeth immediately afterwards, or rinse his mouth vigorously with water or any other beverage to ensure clearance plus avoid formation of plaque.

It is imperative for the dentist to teach methods of brushing the teeth to his child patients in the presence of their mothers as children do not use their toothbrushes effectively. An average child would require at least four practice visits before he can actually master manipulation of his toothbrush correctly. Habits of oral hygiene should be encouraged, rather than
enforced during childhood as they are difficult to acquire later. It is definitely the dentist's responsibility to instruct the child in correct toothbrushing methods at an early age as possible depending on when the child is brought to him. It is for him to urge the whole family to set a good example.

In a very young child who cannot manipulate his toothbrush, the mother should be instructed to offer the child a detergent fruit (apple or orange) or some detergent vegetable (carrot) at the end of each meal or between meals. Ideally speaking, the mother herself should brush the child's teeth.

For mentally handicapped children or children with little or no neuro-muscular coordination, the electric toothbrush can be used for more efficient brushing than the hand toothbrush. A few studies have been done to compare the effects of an electric toothbrush with a manual toothbrush. It has been found that an electric toothbrush results not only in better oral hygiene but a smaller incidence of caries, not forgetting its value in prevention of periodontal disease.

Instructions in toothbrushing to children can best be given by demonstrating with a toothbrush on a plastic model in occlusion or in the child's own mouth
by making him hold a mirror before him. Using either the manual or electric toothbrush the order of brushing the teeth surfaces should preferably be identical. The buccal surfaces of the maxillary molars and premolars of the left side could be brushed first followed by their lingual surfaces on the same side. The corresponding right side should be done after this. Finally the palatal surfaces of the maxillary six anteriors followed by their labial surfaces. The mandibular teeth should then follow the same order.

The brush head without any dentifrice may be placed at the cervix of the crown of the teeth and the brush bristles overlap the marginal and papillary gingivae. The stroke should begin firmly but gently, and carried over the surface of the teeth and gingiva and terminate at the occlusal or incisal edges of the teeth. To begin with the rotatory method may be used and then vertical in order to carefully try and remove debris between the teeth. The occlusal surfaces should be brushed by the scrubbing method. The child is then made and helped to brush his teeth himself first without any dentifrice and then with a little dentifrice on the brush.

To determine the effectiveness of toothbrushing, disclosing wafers or the erytheosine tablet may be chewed by the child. The child is then made to rinse
out his mouth with water. The areas of the teeth with debris left behind have an affinity to the dye. The child is then asked to brush without the dentifrice those areas with the dye. When all the teeth are brushed clean, a double check can be made with a second tablet. Bibby has argued in an article in the Journal of Dentistry for Children about whether it would be correct to say that brushing the teeth will prevent decay. He observes that one should not be against toothbrushing to question its value in preventing decay. There is no doubt or no question that it makes an important contribution to the prevention of periodontal disease. "In any event," he writes, "man and maid alike know that it improves kissability, thus it will never be abandoned." But is there sufficient evidence that it prevents decay "to justify making it the cornerstone of our preventive teaching and dental educational programmes?" There are really few such claims which are supported by statistical evidence. It is too frequently overlooked that better habits of oral hygiene generally accompanied by other efforts to preserve teeth other than toothbrushing contribute to oral cleanliness. Yet it is also evident that good oral hygiene in the form of effective toothbrushing is not the major determinant of dental caries activity by the observation of decay-
free teeth in unbrushed and dirty mouths. However, according to Bibby, five studies have reported caries reduction as high as 40% for patients following improved methods of toothbrushing.

It should be noted that the most significant benefits of toothbrushing are seen immediately after eating, which in many situations forms a somewhat impractical routine of oral hygiene. Again, according to Bibby, in an equal number of other studies, no benefit or more caries has been observed as associated with frequency of toothbrushing.

As regards electric toothbrushing, Bibby has mentioned preliminary evidence in a one year study comparison of children using similar routines of tooth-brushing. This has shown that there has been 20% less caries in the users of Broxodent electric brush (11). Interproximal cleaning of the teeth may be done by dental silk floss or wool or inter-dental sticks which are specially prepared for this purpose. In spite of very efficient toothbrushing methods, interproximal plaque are apt to be left behind. Hence the necessity of carrying out interproximal cleaning with silk floss or inter-dens or even with wool. This method of interproximal cleaning particularly with wool or interdends not only cleans the interproximal spaces and surfaces
of the teeth but also stimulates the gingivae.

Effective toothbrushing therefore requires definite instructions and supervision. According to Tota and Vincent "a recommended procedure of toothbrushing which is effective in cleansing all the tooth surfaces also should massage the gingiva. If a programme of instruction is devised to promote and teach effective toothbrushing, and if the subjects of such a programme show evidence of ability effectively to brush their teeth, then the basis for measuring the therapeutic effect of toothbrushing may be established."(10)
2.3.2 Indirect Education

Indirect patient education is almost as important an indispensable part of patient education of the total office preventive and education programmes as direct education.

In most dental offices in the U.S.A. it is said that because of shortage of time at the disposal of the dentist for complete direct education, patients receive most of their dental health education from slides, tape-recordings, posters, dental literature in the form of pamphlets etc. These various methods provide a highly effective means of audio-visual instruction though indirect education is considered basically just a supplemental education to the direct method.

In a pedodontic clinic or even a general practitioner's clinic where children are treated, the idea of having a children's corner is an excellent one. The child is not only happy because the familiar and appealing environment provided for him but feels welcome, quite at home and very comfortable. These feelings make him more responsive to any type of education, direct or indirect. A children's corner, in other words, promotes indirect education of the child.

With new processes for dental treatment, new
methods of prevention and concepts of mouth hygiene changing dental health is continually becoming a more and more extensive subject. Opportunities for educating a patient therefore never end. The patient too is often curious and interested to know what is going on in his mouth and how it will affect his general health, and what should he expect in future.

Several devices have been introduced for indirect education of the patient mostly electronic in nature. Some of them are the automatic film strip projectors, tape-recorders, electromatic slide viewers, automatic slide projectors with push-button sound synchronising, and apart from these there are also the photographic slides, dental literature in the form of magazines, journals and pamphlets for reading in the waiting room and some pamphlets for the patient to carry home. Automatic filmstrip projectors are one of the very effective method of providing indirect dental office education. These projectors are primarily used to employ professionally prepared filmstrip programmes and consist of projector plus sound contained within a single unit. They may contain fifty to one hundred slides on a single strip of a 35mm film, the sound track and picture being in complete synchronisation and taking only a few seconds to prepare a programme for a viewer. They provide factual
and instructive information in a manner that is pleasing
and interesting to the patient and fairly fascinating to
children. (4)

Tape-recordings are also very effective in the
sense that they can record the dentist's own indirect
patient education programming. Programmes could be made
further automatic by the use of an automatic slide
projector and push-button sound synchronising. The
electromatic slide viewer has been introduced only since
a few years and is not only inexpensive but very simple
to operate. (4)

In settling for his best efforts to educate his
patients, the dentist can have at his disposal the use
of tape recording and/or professional slide film
programming both of which are a very fascinating and
rewarding experience.

Pamphlets too are of utmost importance for
indirect education of the patient. They should as far
as possible be used very discriminatingly and only with
a properly oriented patient. They should be issued
for a specific purpose and to serve a specific need.
It is necessary that the dentist has read and studied
the pamphlet before issuing it to this patient. As
far as possible only one pamphlet at a time should be
given so that the patient can consume just what is
required of him at that particular visit.

These procedures combined with direct education practices provide an effective, interesting, varied and highly successful contribution to the dental health of the patient through preventive dentistry.\(^4\)

In stressing the role of dental health education in the entire office programme, the education programme must be outlined for the patient in advance to show the patient, that a well-coordinated programme of treatment and prevention is provided for him.

Section 2.4 Recall

A recall programme is not only an important aspect of a preventive programme but reflects a total preventive dentistry programme.

The significance of this statement is shown by the fact that definite routine procedures are carried out at a recall appointment. Thorough examination both clinical and radiographic, prophylaxis and multiple topical stannous fluoride treatment should be performed for all patients. Time should be given to direct and indirect patient education in matters of diet, oral hygiene and home-care. To emphasise certain aspects, audio-visual education should be utilised.
Often, to check for thoroughness of diet and home-care, the dentist has to perform certain selective caries activity tests. This is imperative in the case of children who have been treated for rampant caries. Oral hygiene too can be checked by means of disclosing wafers before doing any prophylaxis for the child.

Recall appointments for children should be kept as short as possible. Operative procedures if required may be deferred to subsequent appointments if extensive. However, radiographs can be taken and it may be advisable in certain cases to examine the wet radiographs while the patient waits or while his diet chart is being surveyed. Efficiency and quickness on the part of auxiliaries would help make the sitting as short as possible. In other cases, the patient can be disposed of after radiographs are taken and prophylaxis with a prophylactic paste such as the zircate paste and topical application of SnF$_2$ 10% is done. Written reports may be sent to the parents of the children with the treatment if indicated advised. This may further be discussed on the telephone by the assistant if any relevant explanation is required.

If good relations have been established between the child and the pedodontist, the child will welcome being recalled and will look forward to the day of his appointment. The importance of recall should be
explained and emphasised at the initial visits. If treat-
ment and attendance to the child has been haphazard in
any way, he may not like the idea of being recalled.
Hence the importance of establishing good relations at
the time of initial care and treatment and the putting
forth of the dentist's best skill and professional
workmanship.

The ideal way to recall a patient would be to
schedule the appointment in advance. At the end of the
initial treatment before the patient leaves and at the
time when the importance of a recall and check-up has
been explained and emphasised, would be the best time
to make an advance appointment. The child should,
of course, be assured that he will be reminded about
his appointment by mailing a card to him a week before
and it would be confirmed by telephone a few days later.
For this method of recall it would be advisable to
have a recall card filing system. The cards should
be checked by the receptionist or assistant or secretary
(whoever the dentist has employed and designated for
his secretarial work) at the beginning of every month
and appointment cards mailed out to remind the patient
about his recall appointment.

Another method would be to file the examination
charts making a note on them of the advance appointment
after initial work has been completed in a separate drawer, checked up by the assistant at the beginning of the month and a reminder mailed. This would save the trouble of having 2 separate sets of cards, one for examination and treatment and the other for recall.

A third method of recalling a patient would be just by telephone. A note of just a tentative appointment for example "check-up due 6 weeks later" can be made on the examination and treatment chart. The patient is explained the importance of a recall and informed that he would be contacted by telephone about his appointment and its confirmation if it can be availed.

Whatever the method for recall, it is very important the patient knows the importance of a recall. The recall appointment should be as short and made as effective as possible to justify its importance.
PART THREE

INCORPORATION OF PREVENTIVE DENTISTRY INTO COMMUNITY PRACTICE
Part 3.

Preventive Dentistry being closely related to Dental Public Health, its incorporation into community practice becomes not only essential but it forms one of the most important aspects of community dentistry. Community dentistry concerns the health of the public, may be in groups of population which may consist of groups of families, groups of children, groups of industrialists or businessmen and so on.

Since the subject of this thesis is "Prevention and Control of Dental Caries in Children", subjects have in the previous pages and in the pages to proceed to be discussed in relation to children in particular. The title has been restricted to children not only because the study of pedodontics but because children form an integral part of the family, of society and of the total population in whose hands the future lies.

In dealing with community practice for children, community preventive services shall be briefly described under which will follow fluoridation, preventive pedodontics and school dental services.

Before completion of this part a brief mention of dental manpower resources will be made followed by a discussion on the thesis and summary and conclusions of the thesis.
Section 3.1  Community Preventive Services

Community practice has to be sponsored and financed by the Government. If preventive services on a community level are to be started, they should not be started without the entire cooperation of the Department of Public Health and the State or Federal Government.

The recipients of such programmes expect and should receive the same type of dental care as is received by private patients. Comprehensive service to the recipients should be the main object of the initial programmes that are set up. If sufficient funds are not available, comprehensive care should be geared in such a manner as to provide for just a minimal group, rather than setting up priorities and selected categories of treatment, such as emergency treatment, removal of infection, restoration of first molars etc.

Maintenance care should be provided for all children who enter such programmes. The programmes should be designed to provide maintenance care. It would be a waste of time and money to restore a child's dentition on a one-shot basis unless there be continuous maintenance care till such time as parent or child is able to assume his responsibility of their
dental health. Emphasis on prevention rather than restoration should be made.

Communities should be encouraged to fluoridate their water supplies by providing them with incentives of other communities whose water supplies have already been fluoridated. If trends are needed for fluoridation, again such incentives to provide funds should be given. The use of topical fluorides should be a part of the programme. Also, where communities have not yet accepted fluoridation or their water supply is not being fluoridated due to certain governmental hindrances or where piped water is not available, administration of fluoride tablets should be advised and encouraged along with topical fluoride applications, prophylaxis and the use of a fluoride toothpaste.

The programme should be so designed that dental health care can be provided in the school, home and in the dental office.

Private sectors should be encouraged in the programme – they may purchase dental care either from their own resources or buy a dental insurance.

For such national dental health programmes for children, dental advisory committees or a dental body corporate should be formed, which can meet at regular intervals and look into any problems arising and also
try and improve the services. Dental services should be of the highest order and standards. These bodies or committees which are formed can act as intermediaries between the government and the dentist.

Dental health programmes for children should be approached by both the profession and government with caution. Any headlong involvement may be nebulous and even lack professional advice, though its objectives may be noteworthy. This would only bring about a failure of the very initial efforts. Professional assistance must be sought from the public health service of the state. The success however of such programmes depends on the whole-hearted efforts of support and cooperation of the profession.

3.1.1 Fluoridation

Water fluoridation has been the most significant and useful discovery in the field of dental health in this modern age.

Englander et al., in 1964, have maintained that caries prevalence can be reduced by as much as 50 to 60% in some age groups, and that these benefits due to fluoridation are maintained until at least middle age (12).

Dental caries though not a dangerous disease is certainly responsible for many of the human miseries and
pain, especially in children. Fluoridation may appear as an interim measure as far as the solution to the problem of dental caries is concerned. Severity of the disease is reduced considerably, caries occurring in fluoride areas appear to be of a lower progression which allows longer periods of interval between treatments and the urgency for restoration too is considerably reduced. But complete prevention is not achieved by fluoridation alone. Other preventive measures combined with fluoridation can almost completely prevent this menacing disease which is the most common dental ailment in children.

Water fluoridation was started in the United States about twenty-five years ago, and today millions of people in many countries of the world are now using fluoridated water. It was not until 1942 when an extensive series of well-conducted investigations by Trendley Dean and his co-workers over a period of ten years that a publication of an epidemiological study culminated. This epidemiological study was a survey of the caries experience of white children 12 to 14 years old in twenty-one towns in the middle west of North America. Children in towns containing 1 p.p.m. of fluoride in the water supply had 60% less caries than those living in areas with little or no fluoride.
An almost maximal reduction occurred at this level in mean caries experience in these communities, although there was never any disfiguring in the enamel seen apart from slight hypoplasia. Since that time, these observations have been confirmed in other countries as well, though the level of fluoride in water varies with various climatic conditions which definitely affect the amount of fluoride ingested. (13)

The results of investigators are too numerous. But they do justify the value of providing optimal levels of fluoride in water for children during the period when their permanent dentition is calcifying and maturating for reducing the occurrence of caries prevalence. Some investigators claim that as a result of the reduction in caries prevalence, there is a reduction in the incidence and severity of malocclusion and periodontal disease in fluoride areas, as those compared with non-fluoridated areas. (14)

Fluoridation has had a considerable effect on dental practice - though its impact has been barely felt. James (1961) reported "41% of a group of children 11 to 13 years old dentally fit in high fluoride areas as opposed to approximately 12% in other districts of East England which were low in fluoride though the number of dentists per head of the
population and the number of children per school dental officer was similar in all areas. Twice as many fillings were necessary in the low fluoride area as in the high, and over ten times as many extractions." Treatment requirements would therefore be halved and the dentist can attend to twice as many patients in areas where fluoride in the water supply occurs at optimal levels. (12)

All the foregoing statements show that dental caries should be, or at least should hope to be before long, only a matter for history.

As regards the economic aspects of fluoridation, a quotation of James is self-explanatory and reading it one can conclude how insignificant the costs of fluoridation are per head.

Fluoridation is not for the diseased tooth, it is not for medication, mass or otherwise - it is for the purpose of providing an essential constituent for the growing tooth in the growing child. Its use reduces disease and promotes health - at a cost of about 10d. per person per year. (15)

**Alternative Methods of Fluoride Ingestion**

By far the most effective substitute for fluoridation has been considered to be the use of fluoride tablets. In places where fluoridation has not been accepted or piped, water is not available. According
to Gedalia, the administration of 1 mgm. of fluoride in the form of a tablet to a child "produces a cariostatic effect comparable to that seen in children who have used a community water supply containing 1 ppm fluoride from birth." (16) He further suggests the stoppage of supplemental fluoride after the second permanent molars have erupted. However, the use of fluoride tablets for children requires the complete cooperation of mothers, school teachers and pediatricians attending to those children.

There have been suggestions of adding fluoride to salt or flour or bread, but the idea of giving a child 1 mgm. of fluoride in the form of a tablet seems more practical because one knows the amount of intake. There are children in places with a fluoridated water supply, who have been observed to drink less water than is required of them for receiving an optimal amount of fluoride. In such cases \( \frac{5}{6} \) to 1 mgm. of fluoride proportionately to the amount of water drunk by the child could compensate for the deficiency.

The use of tablets by a pregnant woman is said to ensure a cario-static effectiveness in the deciduous dentition of the foetus. But according to Gedalia, available data do not yet provide a complete answer to the cariostatic effectiveness of both prenatal and
post-natal fluoride intake. (16)

Saunders (17) suggests fluoride vitamin preparations for children as mothers are more accustomed to giving vitamins to their children regularly over a few years. He claims that fluoride in the vitamin fluoride tablet has exactly the same effect as an ordinary fluoride tablet. This proposition seems further justifiable by Hennon who concluded from recent studies that vitamin fluoride supplements do show promising results. At present, in the U.S.A., vitamin fluoride tablets are not being advocated.

Ingestion of fluoride has been considered essential for a period of at least eight to ten years for a child. Therefore a failure of most methods of ingestion is usually due to lack of motivation on the part of the dentist and the parent.

In a ten year study of a community dental health programme from 1948 to 1958 in Western Australia, Jordon et al. had found a reduction of 28 percent in dental caries in deciduous teeth of children 3 to 5 years old, a 34 percent reduction in caries in the permanent teeth of children 6 to 12 years old, and a fourteen percent reduction in children 3 to 17 years old. Beyond these are improvements in filled-tooth ratios and several intangible benefits such as good health and dietary
habits for the children to carry on to adult life. Though the cost of the programme was greater and the caries reductions smaller than those expected for water fluoridation in the same community, yet it was concluded that the latter is by no means a substitution for such a programme. (22)

Section 3.1.2 Preventive Pedodontics

The close association of pedodontics with community preventive services has not only been recognised but valued due mostly to the advantage of conducting epidemiological studies in the field of preventive dentistry. A large supply of dentally unselected population groups readily available for examination is an essential and important prerequisite for an epidemiological study in preventive dentistry. The only source is the school which goes to show the close relationship between pedodontics and epidemiology.

Preventive pedodontic services can be carried out best in school dental clinics. Besides school dental clinics, children may be treated in public health centres which have dental clinics attached to them, mobile dental clinics and also at private clinics if other facilities are not available by special arrangement.
One of the important aspects of preventive pedodontics is the conservation of the primary, that is, the deciduous teeth. Caries of the primary anterior teeth is one of the most unaesthetic sights in children. Because of the importance of preserving these teeth for the first six to seven years of a child's life, mothers should be given definite instructions about feeding their babies and care of their mouths. The commonest causes are due to the nursing bottle or a pacifier. Many mothers are in the habit of giving a nursing bottle or a sweetened pacifier as an aid to sleep. In order to save a child from these horrid "buck teeth" or "milk-bottle teeth", preventive advice is absolutely essential. Failure to remove any of these causative factors like the sweetened pacifier from the child's mouth will mean but little gain to the child apart from purely the mechanical benefit of restoration of the teeth, whereas removal of these factors along with restoring the teeth would definitely ensure a primary arrest of the disease process. However, once the damage is done, adequate restorations of the teeth and stoppage of all causative factors must be carried out as early as possible to avoid the psychological trauma caused to the child by extractions, more so if inadequate general anaesthesia
has been administered. It also has an educative function and introduces the child to restorative techniques, at an early age. When the time arrives for restoring the permanent teeth, the child is not so unwilling as when he would have restorations for the first time, and will not feel the restorative procedure an unduly unpleasant ordeal.

The child will also be able to eat foods of a detergent and fibrous nature which may not only be good just for his general health and constitution only but have a definite cleansing effect on his teeth. Another advantage of adequate restorations would be the avoidance of any damage to the permanent teeth from local sepsis which may result in hypoplasia of the successional teeth, or food stagnation leading to caries of the adjacent teeth. For example, the mesial surface of the first permanent molar being adjacent to the distal surface of the second deciduous molar.

The loss at an early age of deciduous teeth presents orthodontic problems like malocclusion. A malocclusion which already exists may be further aggravated by early loss of primary teeth.\(^{20}\)

Parents play a very important role in promoting the dental health of their children. Interest must be stimulated in the parent by the pedodontist to achieve
sound dental health in a child. Instructions for home-care should begin at an early age. This depends upon when or rather at what age the child is brought to the dentist in normal conditions for a routine check-up or as an emergency case. The first visit in either case is a very important one from the point of view of educating not only the child but more so the parent. Precise home-care instructions should be given to the parent. Parents should be encouraged to set an example by practising what they preach to the child most religiously in order to provide an incentive to the child from his home environment. The child would also thus receive his initial acclimatisation to treatment. Therefore daily oral hygiene, and diet habits are the parents' responsibility. Parents would accept any advice given by the dentist in a tactful manner. But, often, it is necessary to give this advice repeatedly because many parents have a very busy life and tend to be forgetful.

The time when a mother is most susceptible to accepting any advice is when she is pregnant and is either visiting her dentist for her dental care and treatment or is attending a maternal-child health centre or visiting her doctor for prenatal care and advice. This is a very appropriate time to advise
her on the care of the teeth of her baby both prenatally and postnatally. The use of fluoride tablets during pregnancy has, according to some workers, a good effect on the deciduous teeth of the baby rendering them cariostatis. The continued administration of fluoride to the baby after birth further accentuates the cariostatic effect not only on the deciduous but also the future permanent teeth. It is believed now by many that the use of fluoride tablets in the absence or presence of fluoridated communal water renders the teeth cariostatic till middle age. However, as previously mentioned, some workers have advocated that the supplemental use of fluoride tablets up to the age of at least eight years has a similar beneficial effect.

However, attention to the needs of the young has been one of the most neglected aspects of the dental profession. This situation is normally the result of lack of competence on the part of the dentist in handling children which in its turn leads to difficult establishment of a co-operative relationship between the child and his dentist. Time spent by the dentist in the initial visits of the child to establish a pleasant and co-operative relationship with a child patient is always repaid later during both preventive and reparative steps of treatment. (21)
Nevertheless, in a general practice, the dentist is in an ideal position to treat and establish good relations with children as he is familiar with the family and has been treating its individual members from time to time, and can thus influence them about their child's dental health. In spite of these favourable factors, he does not frequently take advantage of them, although they can be of aid to him in carrying out his treatment and preventive procedures quickly and successfully. (21)

Section 3.1.3 School Dental Health Programmes

The administration of school dental health programmes which include a school dental service is one of the most important aspects and endeavours of public health dentistry. It definitely is one that occupies most time for most personnel and is usually conducted at the local or state level. School dental health programmes essentially fall into the broad field of school health. This theory of dental health being included in public health seems a pretty sound one, as it certainly would not be advisable to emphasise the importance of one programme to the exclusion of other
efforts of providing a complete health programme for a child's welfare. By the exclusion of such efforts of providing a complete health programme and isolating dental health, a public health-dentist would only lose the valuable support and cooperation of his colleagues in the fields of medicine, nursing and nutrition.

According to Dunning (22) there are three main categories to be recognised in the field of school health. All these three divisions are the concern of not only the entire public health department including dental personnel but also the educational team. But he further goes on to mention that if these divisions are recognised as separate entities, the problem of school health is seen more clearly. He has mentioned and described the three different categories, the definitions of which were agreed upon by the Committee on Terminology of the American Association for Health, Physical Education and Recreation as:

i) School Health Services;

ii) School Health Education;

iii) Healthful School Living.

i) "School Health Services" are established procedures to appraise the health status of pupils and school personnel. Appraisal as defined by C.C. Wilson is "the process of determining the total health status of
the child through such means as health histories, teacher and nurse observations, screening tests and medical, dental and psychological examinations. A close collaboration and planning by physicians and dentists with teachers and nurses is very essential in the early detection of physical defects in children, as teachers and nurses are more in contact with the children than physicians and dentists.

Following health appraisal comes health counselling of pupils and school personnel, encouragement of correction of defects which can be remedied, assistance in identification and education of handicapped children, help in prevention and control of disease and lastly providing emergency service for injury and sudden sickness. Facilities for referral programmes also should be available.

ii) "School Health Education" is described by Dunning as the process of "providing learning experiences for the purpose of influencing knowledge, attitudes, or conduct relating to individual and community health". This includes dental health education.

iii) "Healthful School Living" again according to Dunning's description is the "designation of a safe
and healthful environment, organisation of a healthful school day and the establishment of interpersonal relationships favourable to emotional, social and physical health". The dentist would be indirectly concerned with these aspects of healthful school living. His main concern would be the school lunch programme. In this his direct collaboration and cooperation with the school nutritionist would help establish good dietary habits with the diet consisting of four basic essentials from both the general and dental health point of view. The term "healthful school living" involves a large range of specific problems ranging right from the physical fitness of school personnel and children to the administration of the school lunch programme. The latter has been dealt with here as it directly concerns the school dentist. It is his duty to ensure that the four basic food groups are served to children, and excessive refined carbohydrates in the form of sticky sweets, toffees etc. are eliminated both during the meal and in the vending machines for between-meal snacks. (22)

School health programmes are best conducted by the combined efforts of both the education and public health departments.

School dental services may include for their
preliminary programmes, dental health education, palliative emergency treatment, preventive measures, case finding through dental examination and other means and referrals to a source of treatment. These preliminary services because of their involvement of prevention and team-work are peculiarly appropriate to a dental public health programme. As a matter of fact, school dental services are part of a dental public health programme in which treatment may or may not be given depending upon funds and facilities provided by the government through the department of public health. (22)

The aims and objectives of a school dental service in a community health programme should therefore be:

(1) Appreciation of the importance of a healthy mouth by every school child with the help of the dental personnel.

(2) With the help of the dentist, appreciation of the relationship of dental health with general health by every school child.

(3) Encouragement of observances of dental health practices inclusive of personal care, proper dietary and oral hygiene habits.

(4) Enlisting the aid of all groups and agencies which
are interested in the promotion of school health including school dental health.

(5) The correlation of dental health programmes with the total school health activities.

(6) Stimulation of the development of resources for providing dental care to all children and youths.

(7) Stimulating dentists to perform adequate health services for children.

Incremental care programmes would be very practical for school dental service beginning from the youngest age groups and gradually increasing every year, till the high school age. The advantage of having school dental nurses in school dental clinics has enabled New Zealand to have the highest dental care index second only to the Scandinavian countries. Children who enter this programme are given both preventive, prophylactic and complete restorative treatment by school dental nurses up to the age of 13. Follow-up programmes are also important aspects of a school dental programme. The importance of regular visits to the dentist, and recall appointments for further routine check-ups have been well recognised by the dental profession. "The regular visit system" according to Bibby\(^{(23)}\) "which dentistry has established is envied by all other health professions. However,
let us not expect more of these visits than they can yield. They save teeth, but unless they are made part of a more comprehensive programme of dietary advice or preventive therapy, they probably do not prevent the occurrence of any new dental decay. If the only purpose of recall visits is to give a standard prophylaxis without the use of fluorides then they should not be done in the name of caries prevention. Let us frankly call it early treatment!"(23) Success of school dental service does not only depend upon the skilful techniques of the dentist or the establishment of favourable interpersonal relationships between child and dentist and/or dentist and other professional colleagues, but on a forceful and dynamic leadership of the school administrator. His role in influencing his teaching staff to encourage every child to enter the school dental service programme and also for his teaching personnel and the rest of his staff to avail themselves of dental care services in the school dental clinic, is of very vital importance.

The services should consist of at least two examinations per year per child along with necessary care which should include polishing, topical fluoride applications, restoration of carious teeth and services
of specialists if necessary. In the last aspect of the services, namely referral to specialists, the underprivileged children cannot come into the picture unless special funds are provided for them by the government. In the absence of school dental clinics, the services can be provided in hospital dental clinics, public health centres, mobile dental clinics, and only where these clinic facilities are not available, in the offices of private practitioners as mentioned previously but by special arrangement.

The services may be provided by dental auxiliaries to prepare and fill cavities for children, to give preventive and prophylactic treatment and to undertake dental health education along with instructions to patients for self-care under the direct supervision of a dentist. Pedodontists can also be employed on a full-time basis to direct the work of the clinics and provide continuing supervision of the dental auxiliaries. The standard of work should be of a high calibre.

More emphasis should be given to a dynamic dental health education programme which could teach not only children but parents too, the importance of dental health and the responsibility of the individual in
maintaining his dental health. The primary aim should be to educate families in the prevention of dental disease and in the need to ensure that all children get regular dental care, from the age of two to three years either as private patients or through community preventive service programmes conducted by the government.

Again, the pre-school children may not be entitled to enter the school dental service programmes. But they can be approached for entering a dental public programme through the Baby Health Centres, nursery schools and kindergartens and day-care centres. School dental clinics are often available for service outside school hours and preschoolers could avail themselves of such opportunities.

Orthodontic treatment can often become very embarrassing in the school dental services because of its high cost. Since "Interceptive Orthodontics" is a part of preventive dentistry, attempts for its inclusion for special selected cases under funds made available by the government should be made. In the U.S.A., this falls under the heading "dental rehabilitation" and funds are usually obtained from funds for the rehabilitation of crippled and handicapped children. If this is practised in other countries, it would help
the school dental service to become a more comprehensive programme.

With effective dental public health programmes a true assessment of the dental needs of the population is possible. The purpose of a dental public health programme is for an epidemiological study which would help assess not only the dental needs of the population, but would also help provide a fair estimate of the amount of manpower required and the financial implications involved as well.
Section 3.2 Dental Manpower Resources.

The ability of the dental profession today is potentially if not factually at stake due to shortage of dental manpower. Maldistribution of manpower, too, to a certain extent, is responsible for the ability of the profession to discharge its responsibilities satisfactorily and effectively. On the other hand, notwithstanding the increase in dental needs of a population, the genuine demands for treatment are not at par with the needs. In spite of this fact, there is a tendency in many countries of the world for accumulating the dental needs of their population due to a shortage of dentists and other dental personnel.

An outstanding example of a very high dental care ratio is found in New Zealand. In this country the dental needs of children have combated by the use of the so-called "school dental nurses" who, after two years of training, are employed in school dental clinics, and are allowed to perform routine restorative procedures with only minimal supervision by fully trained staff. Though this pattern of dental care for children has been bitterly criticised in the United States of America which claims to have the highest
standards of dentistry, yet the Americans have not been able to cope with the many-fold rise in their accumulated needs with the dental manpower they produce. Their dental hygienists are allowed to do only sealing and topical applications of fluoride, but in some states they are allowed only superficial scaling and are not permitted to go beyond the gingival margin. They are fairly well-trained for imparting dental health education, but doing fillings is not part of their training which may have compensated for the low filled-tooth ratios present in their children. By the limited training they receive, it is not possible to in any way decrease or satisfy the dental needs of that country. The programme for training school dental nurses in New Zealand was started in the early 1920s due to the sheer lack of trained dentists to provide care for children. Great Britain adopted the same programme as late as 1956 on an experimental basis, the reason for the programme being the same as it was for New Zealand. Again, Canada unable to meet the demand for care has also been forced to accept modifications in the nature of dental practice and the important role played by dental auxiliaries. The United States is only beginning to reconsider the role of auxiliaries. (25)

Dental manpower resources have been an interesting
study for a freshly graduating dentist. Some areas have a large distribution of dentists and others are less widely distributed. A graduating dentist usually looks for areas which have less wider distribution of dentists to ideally meet the demands for dental services and establish a good and flourishing practice. (26)

The fitting of dental health programmes would be a real problem for countries with a shortage of dental manpower. Besides school dental services and dental services for preschoolers being a part of dental public health programmes, there are also programmes for industrial workers, for the aged and for certain other categories. No doubt the most important endeavour in the field of public health dentistry and the one occupying most time for most personnel is the administration of the school dental health programme. (22) The consideration of manpower resources is therefore a very important aspect of a dental public health programme.

Therefore, the fitting of a dental health programme in a country like the U.S.A. according to Dunning (25) is far from a simple matter. For varying degrees of civilisation different levels of dental care can be planned and designed, "but if the United States - a world leader in dentistry is to be considered worthy of the highest level of care, need for such care
exceeds the ability of present manpower to meet it. Demand too, seems insufficient to lead the public to avail itself either of the full amount of needed dental treatment. How can the gap between dental care and disease be bridged? The answer is obviously in prevention. Demand may then prove easier to alter than manpower, but the attempt to alter demand for dental treatment has value now only, so far as increased efficiency in the use of existing manpower and in the financing of dental care permit small increases in the population segments served." Dunning further goes to stress that the best hope lies in a combined attack using water fluoridation, dietary amendments, oral hygiene habits, early detection and correction of dental defects, control of concomitant disease, in children dental caries being most prevalent we must not forget to include topical fluoride therapy everything we can think of - and then proceeding the rest of the way towards dental health by rendering comprehensive dental health care.\(^{(25)}\)

This is a true picture of the dental needs and demands and the lack of manpower the U.S. has been feeling today. But since prevention is being resorted to, there is hope for the country to face a marked reduction of its accumulated needs. The same could
apply to any other country where a shortage of manpower resources greatly threatens the ability of the dental profession to cope with the dental needs of its population.
Dental defects are extremely common in almost all children which is a sad fact, because in many parts of the world very little or nothing is done to remedy these defects, what to say of preventing them! Most children in their school lives at some time experience tooth decay, disease of the supporting tissues, or other deviations from normal dental health. The margin of safety for the teeth is very narrow compared with that of most other body structures. There is inadequate provision for self repair.

Carious involvement is one of the major problems of children's teeth. The damage caused speedily mounts through the entire period of childhood and early adult life. For this reason, preventive measures taken during early childhood are of particular value. In fact, recent observations have revealed, as suggested by Gedalia\(^16\) that the teeth of the unborn child can be protected if the mother is given fluoride in her diet (fluoride tablets) during the first few months of pregnancy. The fluorides enter the bloodstream of the infant via the placenta and affect the developing
teeth making them resistant.

The dental health of the school child is therefore a problem of service, instruction and treatment. No health programme may be considered complete unless it gives adequate consideration to each phase.

In dentistry for children, one deals mainly with prevention, at least that should be the ideal approach to running a dental practice for children. There is virtually no important phase of this field that is not preventive in its broad context. In this respect, working on children is a truly dedicated service, for prevention is the ultimate goal of all medical science.

Such prevention would certainly parallel the prevention of certain communicable diseases like the prevention of poliomyelitis by the Sabin vaccine.

Preventive Dentistry needs widespread practice among the public. Substantial pressure on both public and dental profession can encourage the practice of preventive dentistry. Dentistry alone cannot cope with this situation though as medicine, it has also made rapid advances. Both these sciences by their rapid advancement are now capable of conquering existing disease and can easily divert their attention to the practice of preventive measures. It is only
with the collaboration of the medical profession that the dental profession can ensure a widespread preventive practice, because good oral health is a part of the normal general health of the whole body. Both together can help stave off oral diseases from both the children and adults.

The ultimate achievement of knowledge concerning preventive dentistry is obviously the extent to which the patients benefit from its use. The ultimate gains of preventive dentistry are therefore a product of knowledge and communication of this knowledge through treatment, education and the acceptance of this information.

Confining preventive dentistry to any unique list of dental sources and dental procedures would therefore seem quite erroneous. Neither can prevention be limited to just certain areas as dental caries or periodontal disease. This goes to indicate that preventive dentistry obviously encompasses all phases of dental diseases and their treatment. Its concern with principles of extraction of teeth is as vital and important as with the need for preservation of teeth. Its concern with community opportunities for improving dental health is equally important as its concern with services performed singularly for patients. When disease exists, the involvement of preventive dentistry
with correction and prevention of complications are equally vital to the need to prevent any further disease. It resists the necessity of resorting to artificial dentures though it may be involved with techniques of denture construction. It is further concerned with human relations, motivations, management and utilisation of time to the best advantage of opportunities and to the benefits enjoyed by the patients. Its positive approach to dental practice energises understanding of daily treatment conditions and situations promoting goodwill of the patients and at the same time encouraging their maximum acceptance of the total oral and dental health problems. Besides providing challenge and enjoyment in the practice of dentistry, it provides utmost satisfaction which comes forth from extending one's best efforts towards providing good dental services. The results of preventive treatment for children can well be recognised and appreciated by the pedodontist or any general practitioner who is running a preventive practice for his child patients besides his adult patients.

Certain established preventive dentistry measures may be accepted by all dentists. Services like dental prophylaxis and the administration of topical fluoride are familiar but may be accepted only
in principle but not carried out routinely. On the other hand, in addition to these measures, the old procedures for prevention still may not receive the attention they deserve and may also be ignored in principle. Doubtless, these latter practices which deal with procedures like caries activity testing and diet counselling which are less familiar because they are less used and less understood, do negate the effects of other preventive measures if not practised. Procedures like these are of a less established precedence of use and hence the tendency to overlook the very real potential of contribution they make to the practice of preventive dentistry. These lesser used programmes, however, along with the new and dynamic aspects of familiar preventive measures do not only constitute the whole of an office programme, but also provide a challenge to positive and new approaches to modern dentistry. In all preventive dentistry is actually applying the knowledge and skills to the best possible use and advantage in the promotion, improvement and maintenance of dental health.

The literature regarding prevention and preventive measures, and the various clinical studies done, not only in the U.S.A. but other parts of the world, would well justify their use as a basis for pedodontic practice.
Every child attended to must have a complete preventive treatment besides any restorative and other treatments required. By preventive is not only meant the topical fluoride therapy but all aspects of prevention, namely, caries activity testing, oral hygiene and dietary advice, direct and indirect patient education, and multiple fluoride therapy and recall. Muhler's multiple fluoride therapy, that is, the combined use of a zirconium fluoride prophylactic paste, topical application of stannous fluoride (10%) and use of a fluoride dentifrice at home seems ideal and practicable. A recent development by Muhler (27) and his co-worker Stookey in the Indiana University is a new prophylactic paste which is manufactured under the name of "Zircate" which reportedly guards against dental decay for "as long as a year after only one application". It embodies more than twenty times the fluoride concentration of ordinary fluoride toothpastes. Muhler who also developed the first fluoride dentifrice under the name of "Crest" is a staunch supporter of fluoridating water supplies. The Times magazine which gave this as a news item labelling it as "Dentistry - And Now Brush-in", goes further by mentioning that Muhler thinks that fluoridation alone is not enough and that out of the 200 millions only
155 million people are served with community water. Of these only about 82 million drink water with natural or supplemented fluoride. He has compounded his new paste for the protection of 100% of the population, and particularly for the handicapped and pre-school children among whom dental care is the most neglected service. It further says that Muhler has not allowed this new paste to go on the market as its indiscriminate use would be damaging. More than 1.5 million persons have tested the paste and a 40-95% reduction in dental caries over a three-year period has been claimed depending on whether or not a treated person drinks fluoridated water regularly. This paste has also been recommended for the 400,000 combat troops in Viet-Nam who average only one brushing in 21 days and they have taken the treatment.

The role of fluorides in prevention of dental caries has been completely established to justify their use in preventive treatment. But fluorides alone or any other aspect of prevention alone cannot help prevent dental caries completely. It is the combination of all other preventive procedures along with the multiple fluoride therapy and fluoridation of water supplies that would enable the reduction of decay.

Another great advantage preventive practice would
have, is that the accumulated dental needs of a population due to lack of dental manpower will in the future bear hope of being satisfied when the overall caries prevalence will be greatly reduced.

Why then should the right of prevention of dental caries be denied to children?

Many people who would choose to have good teeth and good dental health are denied the right to make their own choice because their teeth have been neglected during the critical years of childhood and adolescence. What is needed is a generation of adults, parents, teachers and public health workers who will assume responsibility for seeing that the necessary preventive, educational and corrective services are available to the children until they reach an age where they can make their own decisions about the relative value of good dental health.
PART FIVE

SUMMARY AND CONCLUSIONS
PART 5. SUMMARY AND CONCLUSIONS

"Prevention and Control of Dental Caries in Children" has been discussed briefly under the various aspects of Preventive Dentistry.

In the first part after an introduction which consists of both dental and religious concepts relative to teeth, under the title of "Prevention", philosophy and meaning of prevention, attitudes of the dental profession and the application of the philosophy of prevention have been mentioned.

In the second part under "Incorporation of Preventive Dentistry in a Pedodontic Practice", various aspects of office practice have been discussed. These include, examination and diagnosis, topical fluoride therapy, patient education both direct and indirect and recall. Nutritional counselling, use of fluoride dentifrices and oral hygiene have been described under the direct form of patient education. In the section of recall, its importance and its various procedures have been mentioned.

In the third part which is discussed under "Incorporation of Preventive Dentistry into Community Practice", community preventive services in relation to fluoridation and alternative methods of fluoride
ingestion, preventive pedodontics and school dental services have been discussed. Also a brief mention of dental manpower resources has been made at the end of this section.

It is only during recent years that prevention has been considered a very important aspect of dentistry.

Those dentists who firmly believe in the concepts of prevention are so far-sighted according to Bernier(1) that they contemplate a day when the handpiece and forceps may be just "incidental symbols of the profession". Others who are not of the same opinion consider the prevention of dental disease "an unrealistic goal".

Before all modern methods of treatment and prevention came to be known, man had certain beliefs and concepts of his own regarding his dental health, his general health and public health. These concepts were ingrained in him due to certain old traditions which were mainly of religious origin.

The philosophy of prevention of dental disease consists of a series of actions which are so designed and well-coordinated as to act as a basis for a philosophy of preventive dentistry bringing to the forefront the scientific aspects of dentistry without disregarding the art involved.
All measures relating to prevention, for example, oral hygiene, proper diet, regular visits to the dentist would, if neglected, negate much of the effect resulting from the beneficial use of fluorides. (2)

The reaction of the dental profession to the practice of preventive dentistry is of a varied nature. These reactions depend on several factors, for example the present set-up the dentist has which he is reluctant to change because it is a very flourishing and established practice, the attitude of the children or their parents, the concepts held during student life by a dentist or an indifferent attitude by the dentist to consider that prevention and dental health education are not his job but the job of some other agencies.

Firm need for implementation of a philosophy is a must apart from the existence of the philosophy. The first stage of this implementation may be treatment planning.

Treatment planning as suggested by Bernier (1) would be in three phases: 1) Urgent, 2) Prophylaxis and Anti-Caries Therapy and 3) Counselling in Self Care.

Examination and diagnosis should consist of a very thorough routine examination of the teeth and oral tissues. Both clinical and radiographic examinations
should be carried out to establish correct diagnosis. Multiple caries activity testing helps in knowing the cause of the carious condition besides strengthening efforts for educating and motivating the patient.

Multiple fluoride therapy as suggested by Muhler (6) is the ideal form of preventive treatment, that is combination of application of fluoride prophylactic paste followed by topical application of stannous fluoride 10%, and thirdly the use of a fluoride dentifrice at home.

Patient education is the core of a total preventive programme. Motivation of the parent to assume positive and responsible attitudes towards establishing good oral health should be the primary object of patient education.

According to Mercer (4), patients experiencing caries activity testing and diet counselling show a more favourable response than those who do not.

Patient education, if conducted cautiously and tactfully can help establish lasting and good relations between patient and dentist.

For children, parental co-operation in encouraging to develop the dentist's efforts is a very important facet of the programme of patient education.
Patient education may be both direct and indirect. One is as important as the other.

Nutritional counselling, use of fluoride dentifrices and oral hygiene can come under patient education. Visual aids, models and photographs are all of great general help in providing understanding and clarity to what is to be communicated by the dentist. The patient's own radiographs, study models and photographs, and histories of other work accomplished are among the most important visual aids.

The teaching ability of the dentist has a great bearing on direct patient education.

The entire office team should be conscious of its role in educating the patient.

Nutritional counselling is a difficult aspect of patient education as eating habits are most intimate subjects of discussion.

Avoidance of foods containing sugar, or as far as possible they may be eaten during regular meal times.

The importance of cleaning the teeth immediately after eating something sweet and sticky should be stressed. Or, if that is impracticable, vigorous rinsing of the mouth with water or any suitable beverage may be encouraged.

The use of fluoridated water or fluoride tablets
may be recommended.

Suitable between-meal snacks which are not cariogenic may be suggested.

Prevention of dental caries does not depend only on surgical techniques or community measures like fluoridation but the patient's own efforts.

The use of fluoride dentifrices contributes to the cumulative benefits of other preventive measures such as dietary control, oral water fluoridation and regular dental care.(9)

Methods of brushing the teeth may be taught to the children in the presence of their parents.

If the child is very young, tooth brushing may be done by mother or attendant. When the child is older and can brush, his toothbrushing may be supervised till he reaches a responsible age.

Brushing after every meal should be encouraged, but it seems impractical. The use of detergent foods for school children after their lunch may be advised.

Interproximal cleansing with silk floss, wool or inter-dens to ensure better oral hygiene may be recommended. For mentally handicapped children, the use of an electric toothbrush seems to be of efficiency.

Indirect education is almost as important as
direct in a total office preventive programme.

Several devices in the form of electronic appliances or reading material, posters, pamphlets etc. prove useful for the indirect form of patient education. Recall programme reflects a total preventive dentistry programme.

Whatever the method of recall, whether by the card system, or by telephone or by both, the importance of recall must be stressed at the end of the initial treatment.

Recall appointments for children as with other appointments are preferably kept as short as possible for children.

Incorporation of preventive dentistry into community practice is essential because of its close relation with dental public health. Programmes should be so designed to provide maintenance care to children.

Communities should be encouraged to fluoridate their water supplies or such incentives should be provided for those communities who lack facilities for having the water supplies fluoridated.

Dental health care may be provided in the school, home or in the dental office.

Body corporates or advisory committees to act
as intermediary between dentist and government, and for looking into problems arising and improvements required would be beneficial if set up.

Help by the government and the dental profession is essential for the success of a dental health programme.

Water fluoridation is considered the most useful and significant discovery of modern times in the field of dental health.

Caries reduction of at least 50-60% in some age groups due to the benefits of fluoridation is maintained until at least middle age. (12) (Englander et al. 1964).

The level of fluoride in water varies with various climatic conditions which definitely affect the amount of fluoride ingested. (13)

An extensive series of well conducted investigations by Trendley Dean and his co-workers culminated in the publication of an epidemiological study. Children in towns containing 1 ppm fluoride in the water supply had 60% less caries than those living in areas with little or no fluoride. (13)

The ideal alternative method of ingestion of fluoride in the absence of fluoridated water is the use of fluoride tablets.

Ingestion of fluoride has been considered essential for a period of 8 to 10 years for a child. (22)
Ensuring caries resistance of the deciduous dentition of the unborn child is by giving the mother fluoride tablets during pregnancy.

The close association of pedodontics with community preventive services is mostly due to the advantage of conducting epidemiological studies.

Preventive pedodontic services can be carried out in school dental clinics, mobile dental clinics, clinics attached to public health-centres, and where these facilities are not available, in private clinics by special arrangement.

Conservation of primary teeth is one of the important aspects of preventive pedodontics. Precise instructions for feeding babies and care of their mouths should be given to mothers. Use of sweetened pacifiers or comforters may be discouraged.

Dietary advice regarding consumption of detergent of detergent foods should also be given.

The role of parents is very important in promoting the dental health of their children.

The first visit should be given careful attention, and should preferably be at an early age. Instructions for home care should begin at an early age.

Parents should set a good example about home—
care to their children by practising what they preach to them.

Tactful advice if given is always accepted by parents.

Prenatal and postnatal use of fluoride should be encouraged for rendering the deciduous dentition of the child caries resistant.

Attempts for establishing favourable relations with the child patient should always be made by the dentist to help him carry out preventive and curative procedures successfully.

Of the endeavours of public health dentistry, school dental services form one of the most outstanding aspects.

The inclusion of a school dental health service into the broad field of school health is a pretty sound programme.

According to Dunning\(^{(22)}\) school health can be classified into three main categories:

i) School Health Services

ii) School Health Education

iii) Healthful School Living

i) School health includes the dental health of the children and is attended to by doctors, dentists and
nurses. For early detection of any physical defects, the collaboration of physicians with dentists is essential.

Facilities for referral programmes should also be available.

ii) School health education includes dental health education.

iii) Healthful school living is the concern of the dentist as far as the lunch programme is concerned. Dentists should advise the school nutritionist which could help establish good dietary habits with the diet consisting of the four basic essentials from both the general and dental health point of view.

School health programmes are best conducted by the combined efforts of both the education and public health departments.

Incremental care programmes would be very practical for school dental services beginning from the youngest age groups and gradually increasing every year till the high school age.

Follow-up programmes are also important aspects of a school dental health programme.

Regular visit system established by the dental profession is envied by all other health professions.
Success of a school dental health service does not depend only on the skill of the dentist but on the dynamic leadership of the school administrator.

Services can be provided by trained dental auxiliaries under the supervision of a part-time or full-time dentist or pedodontist.

The standard of work should be very high.

Shortage of dental manpower resources can result in a potential inability of the dental profession to provide adequate services.

The answer to this great problem is Prevention and a reconsideration of the role of dental auxiliaries. A programme of prevention is needed not only as a means of serving today's children, but as a means of ensuring the health standards of tomorrow's individuals. Yet it does, in recompense, expose the possibility of achieving at last a goal, that of overcoming the backlog of unconquered dental disease and unmet treatment needs, by giving every child his chance for a lifetime of good health, and in that lies a great challenge and hope.
PART SIX

REFERENCES


10. Tota, P.D. and Vincent, S.J.
