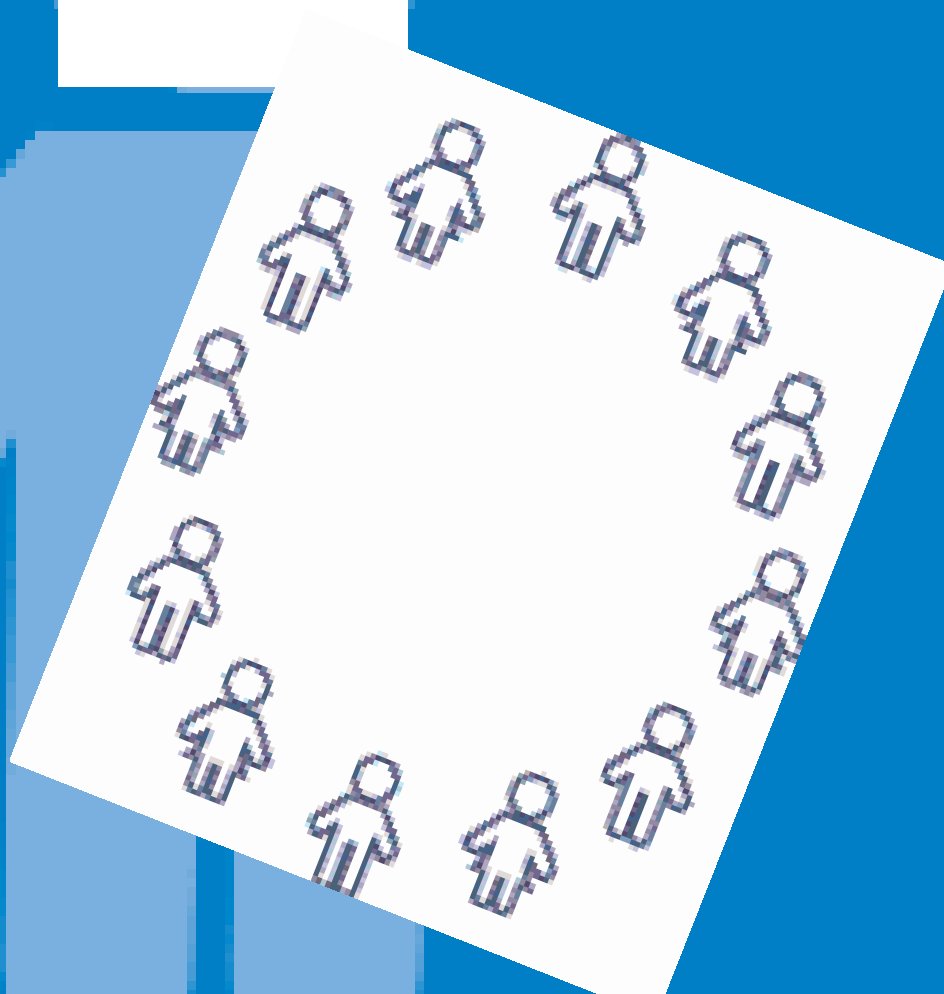
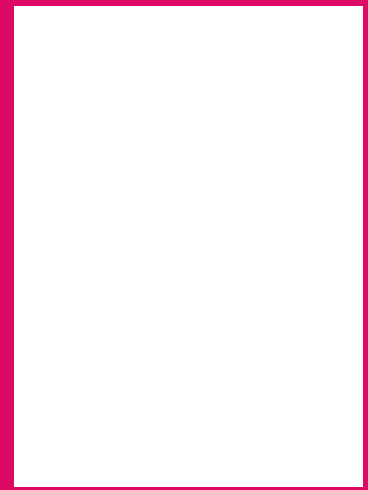
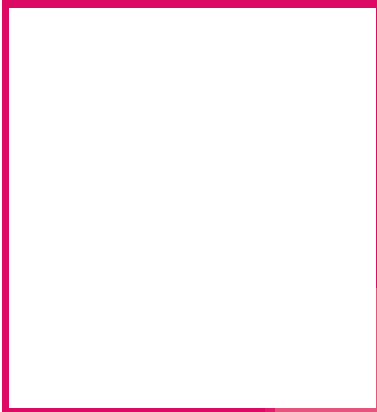


AUSTRALASIAN ACADEMY OF PAEDIATRIC DENTISTRY (INC.)



STANDARDS OF CARE





CONTENTS

2.1	GUIDELINES FOR THE ELECTIVE USE OF CONSCIOUS SEDATION, DEEP SEDATION AND GENERAL ANAESTHESIA IN PAEDIATRIC DENTAL PATIENTS15	SPACE MAINTENANCE.....21
	GUIDELINES FOR THE ELECTIVE USE OF CONSCIOUS SEDATION15	DIAGNOSIS AND PREVENTION OF CROWDING21
	Conscious sedation1521
	Deep sedation15	SPACE REGAINING IN A COMPROMISED POSTERIOR SEGMENT21
	General anaesthesia.....15	ANTERIOR AND POSTERIOR CROSSBITES22
	GENERAL CONSIDERATIONS15	CLASS II MALOCCLUSION23
	Goals of sedation and general anaesthesia15	CLASS III MALOCCLUSION.....23
	Indications for sedation and general anaesthesia.....15	
	Local anaesthesia considerations during sedation16	2.4 GUIDELINES FOR BEHAVIOUR MANAGEMENT 23
	Facilities and equipment16	INTRODUCTION.....23
	APPENDIX I16	OVERVIEW24
	American Society of Anaesthesiologists classification (Modified)16	INFORMED CONSENT24
	APPENDIX 2.....16	SUMMARY.....25
2.2	GUIDELINES FOR DENTAL HEALTH OF THE ADOLESCENT16	COMMUNICATIVE MANAGEMENT25
	DENTAL CARIES17	Introduction.....25
	MANAGEMENT OF CARIES – PRIMARY PREVENTION.....17	Voice control25
	Fluoride17	Nonverbal communication25
	Oral hygiene17	Tell-show-do25
	Diet management17	Positive reinforcement25
	Sealants17	Distraction26
	Professional care18	Parental presence/absence26
	PERIODONTAL DISEASES.....18	TREATMENT IMMOBILISATION.....26
	OCCLUSAL PROBLEMS.....18	NITROUS OXIDE/OXYGEN INHALATION SEDATION26
	MALOCCLUSION.....18	CONSCIOUS SEDATION27
	THIRD MOLARS18	GENERAL ANAESTHESIA27
	TEMPOROMANDIBULAR JOINT PROBLEMS ..19	REFERENCES28
	CONGENITALLY MISSING TEETH19	
	SPECIAL CONSIDERATIONS IN MANAGEMENT OF ORAL PROBLEMS IN ADOLESCENCE.....19	2.5 GUIDELINES FOR PULP THERAPY FOR PRIMARY AND YOUNG PERMANENT TEETH29
2.3	GUIDELINES FOR MANAGEMENT OF THE DEVELOPING DENTITION IN PAEDIATRIC DENTISTRY19	MEDICAL HISTORY29
	INTRODUCTION.....19	DENTAL FACTORS29
	MANAGEMENT OF ORAL HABITS20	PULP TREATMENT OPTIONS29
		CHOICE OF PULP TREATMENT30
		CHOICE OF MEDICAMENTS FOR PULP THERAPY30
		COMMENTS.....30
		2.6 GUIDELINES FOR PAEDIATRIC RESTORATIVE DENTISTRY31
		INTRODUCTION.....31

PIT AND FISSURE SEALANTS	31	Susceptible patients	38
PREVENTIVE RESIN RESTORATIONS	31	Patients with conditions not requiring prophylaxis	38
RESTORATION OF THE PRIMARY AND PERMANENT DENTITIONS	31	CLASSIFICATION OF PROCEDURES	38
REFERENCES	32	Procedures that require prophylaxis	38
2.7 GUIDELINES FOR TEMPOROMANDIBULAR JOINT DISORDERS IN CHILDREN AND ADOLESCENTS32		Procedures that do not require prophylaxis	38
DISORDERS OF THE		Relative risk of procedures	38
TEMPOROMANDIBULAR JOINT	32	RECOMMENDATIONS FOR USE OF PROTOCOLS FOR ANTIBIOTIC PROPHYLAXIS38	
Congenital oculo-auriculo vertebral disorder	32	REFERENCES	39
Robin sequence	32	2.10 MANAGEMENT OF PAEDIATRIC DENTAL PATIENTS RECEIVING CHEMOTHERAPY AND/OR RADIATION	39
Congenital subluxation of the TMJs.....	32	CHEMOTHERAPY	39
Neonatal septic arthritis	32	RADIOTHERAPY	39
Congenital hemifacial (unilateral) hypoplasia.....	32	BONE MARROW TRANSPLANTATION	39
Hemihyperplasia	32	DENTAL MANAGEMENT	39
Unilateral condylar hyperplasia	33	Initial admission, diagnosis and screening	39
Hemifacial atrophy (Romberg syndrome)	33	Immediate dental care	40
Osteochondroma of the condyle	33	Follow-up dental care	40
Mandibular condylosis	33	HAEMATOLOGICAL GUIDELINES	40
Massive Osteolysis (“phantom bone” or Gorham’s disease)	33	2.11 PERIODONTAL DISEASES OF CHILDREN AND ADOLESCENTS	41
Traumatic injury	33	INTRODUCTION.....	41
Juvenile chronic arthritis (JCA) involving the temporomandibular joint.....	33	GINGIVITIS	41
Temporomandibular Disorder (TMD).....	33	CHRONIC PERIODONTITIS	41
BIBLIOGRAPHY.	34	AGGRESSIVE PERIODONTITIS	41
APPENDIX 1	34	NECROTIZING ULCERATIVE PERIODONTAL DISEASES.....	41
Development of the temporomandibular joint.	34	FIGURE 1	42
APPENDIX 2.....	35	SYSTEMIC DISEASES FORMS OF PERIODONTITIS	43
Additional notes on the diagnosis and management of Juvenile chronic arthritis.....	35	SUMMARY	43
APPENDIX 3.....	35	REFERENCES	43
Additional notes on the diagnosis and management of Temporomandibular disorder.	35	2.12 GUIDELINES FOR PERIODONTAL THERAPY	43
2.8 GUIDELINES FOR PRESCRIBING DENTAL RADIOGRAPHS	36	INTRODUCTION.....	43
Guidelines for prescribing dental radiographs - table. 37		GOALS OF PERIODONTICS	43
2.9 ANTIBIOTIC CHEMOPROPHYLAXIS FOR PAEDIATRIC DENTAL PATIENTS AT RISK	36	DIAGNOSIS AND TREATMENT OF PERIODONTAL DISEASES.....	43
GUIDELINES FOR CLINICIANS	36	TREATMENT OUTCOMES.....	44
History	36		
Other considerations.....	36		
CLASSIFICATION OF PATIENTS.....	36		
Highly susceptible patients	36		

INTRODUCTION

The Australasian Academy of Paediatric Dentistry (Inc.) held its inaugural meeting in Perth, Western Australia, in May 1993, under the Chairmanship of the first President, Dr Roger K Hall, OAM. At this meeting the Constitution of the Academy was approved and adopted.

Article 2 of the Constitution lists the objectives of the Academy as follows:

- 1) The Academy shall be the symbol of excellence in practice, education and research in paediatric dentistry.
- 2) The Academy, shall be the official representative of the specialty of paediatric dentistry when liaison is required with other dental organisations, allied health professions and government and private agencies concerned with the dental health of the public.
- 3) The Academy shall involve itself actively in the development and implementation of national programs of dental health for children.
- 4) The Academy shall foster the development and promulgation of sound tenets for paediatric dental practice and research accompanied by constant critical evaluation and review.
- 5) The Academy shall strive constantly to enhance the quality of graduate training in paediatric dentistry.
- 6) The Academy shall participate actively in the development and delivery of programs of continuing education in the field of paediatric dentistry for the Academy per se, and for the dental profession as a whole.
- 7) The Academy shall be alert to its responsibility to the community and the profession in the prevention and control of oral disease.

In order for these objectives to be attained, it soon became clear the Academy needed to develop “Standards of Care” for the infants, children and adolescents of the region.

Cognisant of the fact that various other paediatric dental organisations around the globe had already developed their own guidelines, it was decided by the membership that these existing guidelines be modified, adapted and added to, in order to more closely reflect the requirements of our region.

The Australasian Academy of Paediatric Dentistry (Inc.) wishes to formally acknowledge the enormous contribution of the American Academy of Paediatric Dentistry (AAPD) and the British Society of Paediatric Dentistry (BSPD) for allowing the use of their guidelines in the preparation of this document.

Particularly, the Academy recognises the support of Dr John Bogert, former Executive Director (AAPD), Dr John Rutsauskas, current Executive Director (AAPD), Dr Paul Kennedy, past President (AAPD) and Dr Richard Welbury, past President (BSPD).

The Australasian Academy of Paediatric Dentistry (Inc) also acknowledges all other organisations and individuals who have contributed to this document, most of which have been further acknowledged within the text.

Dr Roger K Hall, OAM - President
Australasian Academy of Paediatric Dentistry (Inc.) 1993 - 1996

Dr Richard P Widmer - President
Australasian Academy of Paediatric Dentistry (Inc.) 1996-1999

Dr Peter J Gregory - President
Australasian Academy of Paediatric Dentistry (Inc.) 1999 - 2002

ABOUT THESE GUIDELINES

- 1) These guidelines are published by The Australasian Academy of Paediatric Dentistry (Inc.). This is the first edition and will be revised on a regular basis.
- 2) This work is copyright. It may be reproduced in whole or in part for study and training purposes subject to the inclusion of acknowledgement of the source. No commercial usage or sale is permitted, without the expressed written permission of the Academy.
- 3) These guidelines are a general guide to appropriate clinical dental practice, to be followed only subject to the clinicians judgement in each individual case. The guidelines are designed to provide information to assist decision making and are based on the best information available at the date of completion (November 2002).
- 4) Any trade names used in these guidelines are for identification purposes only. Their use does not imply endorsement of any particular brand of drug, medicament or equipment.

ORAL HEALTH POLICIES

1.1 ORAL HEALTH FOR CHILDREN AND ADOLESCENTS

Oral health is an essential and integral element of general health and well-being.

Dental caries, periodontal disease and other oral conditions are impairments that can limit substantially a child's growth and development and an individual's participation in major life activities. A person should be considered dentally compromised if pain, infection, or lack of functional dentition:

- 1) restricts consumption of a diet adequate to support growth and energy needs,
- 2) delays or otherwise alters growth and development, or
- 3) inhibits performance of any major life activity, including work, learning, communication, and recreation.

It is imperative to emphasise the importance of including oral health programmes as essential and integral elements of total health care. Comprehensive health care cannot be achieved unless oral care is a strong priority in all health service programmes. The Australasian Academy of Paediatric Dentistry (Inc.) emphasises the importance of a preventive programme and the other services that would provide all treatment necessary to restore, maintain and optimise the oral health of children and adolescents.

1.2 EMERGENCY ORAL CARE FOR CHILDREN

INTRODUCTION

The child suffering from acute oral trauma, pain, bleeding, or infection often presents special challenges to treating practitioners. Often the skills, techniques, or procedures unique to the paediatric dentist should be called upon to deal most effectively with the emergency situation for the child or special patient. Therefore, attention should be given by members of the Australasian Academy of Paediatric Dentistry (Inc.) to ensure that emergency paediatric dental care is available at all times.

RECOMMENDATION

Paediatric dentists are encouraged to develop cooperative arrangements whereby emergency oral care for children and adolescents may be obtained at all times.

1.3 FLUORIDE

The Australasian Academy of Paediatric Dentistry (Inc.) supports the use of fluoride as an effective method of reducing the risk of dental caries in children and

adolescents. Epidemiological data strongly indicates that significant dental caries reductions occur in communities with optimum levels of fluoride in the drinking water. The Academy endorses and encourages the adjustment of the fluoride content of community water supplies to the optimum levels where possible. The Academy also supports the appropriate use of fluorides in other vehicles including drops and tablets, toothpaste, mouthwashes, professional preventive treatments and dental restorative materials. It strongly recommends that local guidelines for appropriate use be followed, particularly noting recommendations for the period during the time of tooth development. The need for, and cost of dental treatment can be reduced considerably in young people when fluorides are used as part of a complete preventive programme which should also include dietary, oral hygiene and other preventive measures.

RECOMMENDATIONS

The Academy encourages continued research on the effect and use of fluoride on the dental health of children and adolescents. It encourages continuing development of effective methods of fluoride use.

SYSTEMIC FLUORIDES

The Australasian Academy of Paediatric Dentistry (Inc.) supports the appropriate use of systemic fluorides when the local water supply is not fluoridated. Before prescribing systemic fluorides for any child or adolescent, the current use of other fluorides should be determined using a fluoride inventory. An appropriate clinical assessment of the individual's dental caries risk should also be established. The Academy advises that the local endorsed recommendations should be followed. In Australia these can be obtained from The Australian Dental Association "The Practical Guides". In New Zealand these can be obtained from the Ministry of Health.

TOPICAL FLUORIDES

The Australasian Academy of Paediatric Dentistry (Inc.) supports and encourages the appropriate use of topical fluoride products including toothpastes, mouthwashes, gels and rinses. The Academy advises that current local recommendations for use should be followed to avoid inappropriate ingestion of these products during the development of teeth.

GUIDELINES

- 1) Dental Practitioners should be aware of the current fluoride products available on prescription and/or over-the-counter. They should encourage patients in the appropriate use of fluoride to optimise prevention of dental caries. It is important to note

that commercial recommendations in Australia and New Zealand do not always match the recommended use as published by The Australian Dental Association “The Practical Guides” or the New Zealand Ministry of Health.

- 2) Dental practitioners should note the current scientific understanding of how fluoride alters the process of dental caries and use this knowledge in their use of fluoride products. References are attached.

A fluoride inventory is an appropriate way to determine a patient’s use of fluoride. This should be recorded prior to prescribing fluoride use for patients. A suggested inventory follows.

FLUORIDE INVENTORY

INFANT

Is baby breast-fed totally or partly?
 Is infant formula used? (milk or soy based)
 What is the water source at home? (reticulated, tank, bottled, bore)
 What is the fluoride content of the water?
 Are baby foods used? (home made, commercial)
 Are there cultural feeding practices that may contribute fluoride to the diet?

2-6 YEARS

What is the water source at home? (reticulated, tank, bottled, bore)
 What is the fluoride content of the water?
 Are foods mainly home-prepared or commercially prepared
 What kind of toothpaste is used?
 What is the fluoride concentration in the toothpaste?
 Are fluoride supplements used? (type and concentration)
 Has fluoride been applied professionally? (type and frequency)
 What medications are used? (pharmaceutical, homeopathic)
 Are there cultural feeding practices that may contribute fluoride to the diet?

GENERAL QUESTIONS

Is the drinking water filtered at the tap? (what kind of filter)
 What fluoride products are currently used?
 What is the caries risk and what fluorides should be used with that risk?

REFERENCES

FDI World Dental Federation. Position Statement on Fluorides and dental Caries. FDI World 1995; 7-10, 1995.

Murray JJ. Efficacy of preventive agents for dental caries. Systemic fluorides: water fluoridation. Caries Research 1993; 27: 2-8.

Stephen KW. Systemic fluorides: drops and tablets. Caries Research 1993; 27: 9-15.

Künzel W, Systemic use of fluoride – other methods: salt, sugar, milk etc. Caries Research 1993; 27: 16-22.

König KG. Role of fluoride toothpastes in a caries-preventive strategy. Caries Research 1993; 27: 23-28.

Wei SHY, Yiu CKY. Evaluation of the use of topical fluoride gel. Caries Research 1993; 27: 29-34.

Petersson LG. Fluoride mouthrinses and fluoride varnishes. Caries Research 1993; 27: 35-42.

Toumba KJ, Curzon MEJ. Slow release fluoride. Caries Research 1993; 27: 43-46.

1.4 EARLY CHILDHOOD CARIES

A young child who is able to frequently suckle during day and nocturnal sleep times, fluids containing fermentable carbohydrates such as fruit juices, nursing formulae, bovine and human milk or frequently uses a ‘sweetened’ pacifier, in the presence of cariogenic bacteria and dependent on a number of complex factors, may be at risk of significant dental disease. Further, inappropriate bottle nursing of children past the requirements for nutrition may promote early childhood caries which has a characteristic pattern. This is dependent on the child’s susceptibility, the nature of the nursing fluid, the frequency and duration of the nursing pattern and the absence of appropriate oral hygiene measures.

The risk of early childhood caries also exists for susceptible children who are breastfed. The aetiology related to frequent and extended nursing times results in exposure of susceptible tooth surfaces to metabolic by-products of cariogenic bacteria. The Australasian Academy of Paediatric Dentistry (Inc.) recognises early childhood caries in breastfed infants is a complex issue and includes medical and social issues. The Australasian Academy of Paediatric Dentistry (Inc.) does not suggest the risk of dental disease contraindicates breastfeeding of susceptible children.

RECOMMENDATIONS

- 1) Children should not be put to sleep with a bottle containing any fluid other than water. Ad libitum nocturnal breastfeeding should be modified in conjunction with nutritional and medical advice to decrease the frequency of exposures.
- 2) Parents should be encouraged to commence the introduction of a drinking cup when the child is physically able. Weaning from bottle-feeding should start as soon as possible depending on the development of the child and his/her nutritional requirements.
- 3) It is inappropriate to introduce anything in a nursing bottle other than water, human and bovine milk or nursing formulae. Consumption of flavoured milk, fruit juices, fruit drinks, vitamin C supplement drinks, soft drinks and cordials from a bottle should be avoided. Non-nursing fluids when offered, should be from a cup. Consumption of sport drinks by a child should also be avoided unless on medical advice.
- 4) Parents should be encouraged to carry out appropriate oral hygiene measures on eruption of the first primary tooth.
- 5) Early well child oral health examinations are encouraged following the eruption of the first primary tooth and no later than 12 months of age, to provide parents with correct dietary and oral hygiene

advice to prevent dental disease.

1.5 BREASTFEEDING

Human breastmilk is recognised as the ideal diet for infants. Breastmilk contains all the nutritional requirements for an infant's first six months of life and is recognised to be supportive to the nutritional, immune and emotional development of the child into the second year. The significant importance of frequent intake of colostrum for the newborn is conclusive. As primary care givers to the infant population, the Australasian Academy of Paediatric Dentistry (Inc.) recognises the significant advantages of breastfeeding and its integral part in the reproduction process. In doing so, the Australasian Academy of Paediatric Dentistry (Inc.) supports the position on breastfeeding of various authorities including the World Health Organisation and UNICEF.

As for susceptible bottle fed infants, early childhood caries remains a risk for susceptible breastfed infants. The aetiology of the dental caries is a complex interaction of susceptible dental surfaces, frequent and prolonged feeding patterns, pathogenic bacteria and fermentable carbohydrates. The influence of the child's immune development, the level of maternal milk immunoproteins, the time of inoculation and the pathogenicity of cariogenic bacteria are also recognised.

Prevention of early childhood caries should be promoted with early Well Child Oral Health Examinations encouraged following the eruption of the first primary tooth and no later than 12 months of age. The aim is to provide parents with correct dietary and oral hygiene advice to prevent dental and periodontal disease. Where a child is seen to be at risk, dietary patterns may, in conjunction with the child's medical and nutritional practitioners, be modified to decrease the frequency of exposure yet maintain optimal nutritional requirements.

Breastfeeding remains an emotive issue. The Australasian Academy of Paediatric Dentistry (Inc.) supports the need for further scientific research on the oral and systemic effects of breastfeeding and human breast milk. The beneficial effects of breastfeeding on orofacial growth and oral neuromuscular function is also recognised as an area requiring further investigation.

1.6 DIETARY GUIDELINES FOR ORAL HEALTH

INTRODUCTION

Dental caries and its sequelae are among the most ubiquitous health problems facing Australasian children. Several studies have identified frequent ingestion of refined carbohydrates and prolonged contact of these substances with teeth as particular risk factors in the development of dental caries. Recent research has been directed towards the identification of "high risk" versus "low risk" foods, but this promising area of research has yet to be sufficiently elucidated. In keeping with its responsibility to the public and the profession in the

matter of the prevention and control of oral diseases, the Australasian Academy of Paediatric Dentistry (Inc.) makes the following recommendations:

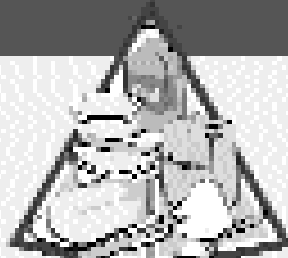
RECOMMENDATIONS

- 1) Dentists should educate the public about the known association between frequent consumption of refined carbohydrates and dental caries.
- 2) Dentists should educate the public about the known association between frequent consumption of acidic foods, beverages and medicines (including supplements) with tooth erosion.
- 3) School health education programs and food services should be encouraged to promote balanced diets low in both caries-risk and erosive potential.
- 4) When prescribing or dispensing medications it is preferred that non-sugar medicine is prescribed (if available) and that proper oral care advice is given.
- 5) Research, education and appropriate legislation/regulation to promote diverse and balanced diets should be supported.
- 6) The Australasian Academy of Paediatric Dentistry (Inc.) endorses the Dietary Guidelines for Australians as published in 1995 by the Commonwealth of Australia, and endorsed by the National Health and Medical Research Council (as listed below). In light of these guidelines, paediatric dentists should encourage the public to monitor the presence and relative amounts of carbohydrates in

Healthy Eating Pyramid

Eat in small amounts

Oil, Margarine,
Reduced-fat spreads, Butter, Sugar



Eat moderately

Lean meats, Eggs, Fish,
Chicken, Turkey, Milk,
Yogurt, Cheese



Eat Most

Vegetables,
Dried peas, Beans
and Lentils,
Cereals,
Breads,
Fruit,
Nuts



Optimal health through food variety and physical activity

foods, as indicated by ingredients and listed on food labels. The Healthy Eating Pyramid, a guide to daily food choices, can be used in patient/parent education (as shown previous page).

DIETARY GUIDELINES

- 1) Enjoy a wide variety of nutritious foods.
- 2) Eat plenty of bread and cereals (preferably wholegrain), vegetables (including legumes) and fruits.
- 3) Eat a diet low in fat and, in particular, low in saturated fat.
- 4) Maintain a healthy body weight by balancing physical activity and food intake.
- 5) If you drink alcohol, limit your intake.
- 6) Eat only a moderate amount of sugars and foods containing added sugars.
- 7) Choose low-salt foods and use salt sparingly.
- 8) Encourage and support breast-feeding.

There are also two additional guidelines on specific nutrients

- 9) Eat foods containing calcium. This is particularly important for girls and women.
- 10) Eat foods containing iron. This applies particularly to girls, women, vegetarians and athletes.

THE HEALTHY EATING PYRAMID

This simple model originally developed in 1982 and most recently amended in 1999 by The Australian Nutrition Foundation Inc., can be used to put these guidelines into action. The recommended number of servings per day from each portion of the model is as follows: milk, yoghurt, cheese: 2-3 servings; lean meat, eggs, fish, chicken (without skin): 2-3 servings; vegetables, dried peas, beans and lentils, fruits, nuts: 5-9 servings; bread, cereals (including whole grain cereals and wholemeal bread, rice and pasta): 5-11 servings. See previous page.

1.7 SPORTS DRINKS

The Australasian Academy of Paediatric Dentistry (Inc.) recognises the risks posed to dental health of indiscriminate use of sports drinks in children and adolescents, however, it is likely that this risk is no greater than that posed by other soft drinks or cordials. The Australasian Academy of Paediatric Dentistry (Inc.) would strongly recommend that dentists, dieticians and other healthcare workers promote water as the drink of choice for all children and adolescents on a daily basis.

1.8 CHILD ABUSE AND NEGLECT

Child abuse may be defined as those acts of omission or commission that deprive a child of the opportunity to fully develop his/her unique potential as a person either physically, socially or emotionally. The first step in preventing child abuse and neglect is recognition and reporting. Dentists who treat children are in a strategic position to recognise and report mistreated children. The laws governing the notification of suspected child abuse and neglect vary across Australasia. It is important that dentists who treat children understand the local laws and directives applicable to child abuse and neglect in their region and that they deal effectively with suspected cases of child abuse and neglect.

DEFINITION OF DENTAL NEGLECT

Dental caries, periodontal diseases and other oral conditions, if left untreated, can lead to pain, infection and loss of function. These undesirable outcomes can adversely affect learning, communication, nutrition and other activities necessary for normal growth and development. Dental neglect is wilful failure of parent or guardian to seek and follow through with treatment necessary to ensure a level of oral health essential for adequate function and freedom from pain and infection. This applies to oral conditions that are obvious to a lay person or where they have been made aware of it by a member of the dental/medical team and where they are not faced with any barriers to access of dental care (economic, intellectual or geographic).

1.9 INFANT ORAL HEALTH CARE

The infant oral health care visit should be seen as the foundation on which a lifetime of preventive education and dental care can be built, in order to help assure optimal oral health into childhood. Oral examination, anticipatory guidance including preventive education, and appropriate therapeutic intervention for the infant can enhance the opportunity for a lifetime of freedom from preventable oral disease.

RECOMMENDATIONS

- 1) A postnatal initial oral evaluation visit should follow the eruption of the first primary tooth.
- 2) At the infant oral evaluation visit, the dentist should:
 - a) Record a thorough medical and dental history, covering the prenatal, perinatal, and postnatal periods
 - b) Complete a thorough oral examination
 - c) Assess the patient's risk of developing oral and dental disease, and determine an appropriate interval for periodic re-evaluation based on that assessment
 - d) Discuss and provide anticipatory guidance regarding dental and oral development, fluoride status, non-nutritive oral habits, injury prevention, oral hygiene and effects of diet on

the dentition.

- 3) Dentists who perform such services for infants should be prepared to provide therapy when indicated, or should refer the patient to an appropriately trained individual for necessary treatment.

1.10 THE ROLE OF PROPHYLAXIS IN PAEDIATRIC DENTISTRY

There are several indications for a dental prophylaxis, including:

- 1) Removal of plaque from teeth
- 2) Removal of extrinsic stains from teeth
- 3) Polishing teeth after removal of calculus
- 4) Facilitation of a thorough clinical oral examination
- 5) Education and introduction of the child to dental procedures.

Traditionally, the dental prophylaxis has included tooth polishing with a rubber cup. This is a procedure whereby a dental polishing paste is applied to tooth surfaces with a rotary rubber cup or rotary bristle brush. Based on research findings regarding the potential of a rubber cup/pumice prophylaxis to remove fluoride-rich enamel, the toothbrush prophylaxis has gained acceptance for use during initial or recall examination visits. In this procedure, plaque is removed from tooth surfaces using a toothbrush and dental floss. Part of the rationale for the toothbrush prophylaxis is to conserve the fluoride-rich enamel surface while enhancing the uptake of fluoride.

RECOMMENDATIONS

- 1) The dental prophylaxis should be used as part of a comprehensive preventive program designed to improve children's ability to maintain their personal oral health. The use of dental prophylaxis should be considered as an educational tool to allay patient fears regarding the manipulation of oral tissues.
- 2) A patient-appropriate dental prophylaxis should be performed when indicated, in conjunction with oral hygiene instruction, periodic oral examination visits and other indicated preventive care.

1.11 MINIMISING HEALTH HAZARDS ASSOCIATED WITH THE USE OF NITROUS OXIDE/OXYGEN ANALGESIA

INTRODUCTION

Current epidemiologic studies conclude that there are increased general health problems and reproductive difficulties among dental personnel chronically exposed to unscavenged nitrous oxide/oxygen. The mechanisms by

which these toxic effects are produced are unclear but ample evidence exists to warrant caution in the use of nitrous oxide/oxygen. Accordingly, the Australasian Academy of Paediatric Dentistry (Inc.) recommends that dentists and dental auxiliaries minimise the exposure to ambient nitrous oxide by maintaining the lowest practical levels in the dental environment.

RECOMMENDATIONS

- 1) Up-to-date scavenging systems must be used when nitrous oxide/oxygen is employed
- 2) Exhaust systems that adequately vent scavenged air and gases to the outside of the building should be employed
- 3) Careful, regular surveillance and maintenance of the nitrous oxide/oxygen delivery equipment should be practiced
- 4) Nitrous oxide/oxygen discharge from the oral cavity of the patient should be minimised during dental procedures
- 5) Use of devices to monitor ambient nitrous oxide should be considered in light of evolving equipment technology
- 6) An additional means of rapid air exchange in operatories where nitrous oxide/oxygen is employed should be considered.

1.12 INFECTION CONTROL GUIDELINES

The Australasian Academy of Paediatric Dentistry (Inc.) endorses the guidelines for infection control published in 1996 by the NHMRC in Australia entitled "Infection control in the health care setting". These guidelines are endorsed by the Australian Dental Association and can be accessed at www.nhmrc.gov.au.

In New Zealand, the Australasian Academy of Paediatric Dentistry (Inc.) endorses the NZDA Code of Practice entitled "Control of Cross Infection in Dental Practice (Approved 1995).

1.13 IMMUNISATION OF CHILDREN

For more than 200 years, since Edward Jenner first demonstrated that vaccination offered protection against smallpox, the use of vaccines has continued to reduce the burden of many bacterial and viral diseases. Smallpox has been eradicated, and poliomyelitis is close to global eradication.

As with most health care interventions, vaccination is not entirely risk-free, yet the currently available vaccines are safer than the risks of the diseases they prevent. The introduction of acellular pertussis-containing vaccines has significantly reduced the numbers of children affected by the common minor, but often distressing, side effects of vaccination. As a result of successful vaccination programs, deaths from tetanus, diphtheria, Haemophilus influenzae type b and measles are now extremely rare in Australia and New Zealand. Nevertheless, pertussis, measles and rubella still cause a great deal of disease and disability in Australia and New Zealand

Vaccinating a child not only protects that child, but other children as well, by increasing the general level of immunity and minimising the spread of infection. It is vital that health care professionals take every available opportunity to promote vaccination of children and adults. It is also important that the public be made aware of the proven power of immunisation to save lives and prevent serious illness.

The routine immunisation of children has been extraordinarily successful in the prevention and eradication of several potentially devastating communicable diseases. The Australasian Academy of Paediatric Dentistry (Inc.), in its efforts to promote optimal health for children, endorses the current recommendations on childhood immunisations of the NHMRC in The Australian Immunisation Handbook 7th Edition and the New Zealand Ministry of Health found on the website www.imac.auckland.ac.nz.

1.14 HOSPITALISATION FOR DENTAL CARE OF INFANTS AND CHILDREN

INTRODUCTION

Paediatric dentists often are asked to treat patients who present special challenges relating to their age, behaviour, medical status, developmental disabilities, intellectual limitations, or special treatment needs (such as protection of their developing psyche and medical support necessary for the treatment of other pathologically compromising conditions). To effectively address these challenges and meet these treatment needs, paediatric dentists have developed and employ a variety of management techniques, including accessing anaesthesia services and/or the provision of dental care in a hospital setting with or without general anaesthesia. Hospital dentistry is an integral part of the curriculum of all accredited

advanced paediatric dental training programs and paediatric dentists are, by virtue of training and experience, qualified to recognise the indications for such an approach and to render such care.

RECOMMENDATIONS

- 1) The Australasian Academy of Paediatric Dentistry (Inc.) affirms that indications exist for the treatment of selected patients with or without general anaesthesia in a hospital setting, and that paediatric dentists are qualified by training and experience to recognise these indications and provide this care.
- 2) The Australasian Academy of Paediatric Dentistry (Inc.) shall work with all concerned medical and dental colleagues and organisations to remove barriers to hospital dental care of patients best treated in that setting.

1.15 PREVENTION OF SPORTS-RELATED INJURIES

The Australasian Academy of Paediatric Dentistry (Inc.) is concerned about the prevalence of sports-related injuries in our nation's children and adolescents. The increased competitiveness in sports has resulted in an alarming number of dental and facial injuries which, combined, represent a high percentage of the total injury experienced in sports.

RECOMMENDATIONS

- 1) A properly fitted sports mouthguard be recommended for all children and adolescents participating in organised and unorganised contact, collision sports and leisure activities.
- 2) The Academy supports mandates by sporting bodies for the use of athletic mouthguards in any sporting activity containing the risk of orofacial injury.
- 3) A dentist with expertise in dental and facial injuries be consulted prior to the start of a season to recommend procedures for dealing with sports-related injuries, such as avulsed teeth.

The Australasian Academy of Paediatric Dentistry (Inc.) recognises that there are three types of mouthguards that are available. These are stock or preformed (ready-to-wear), mouth formed (boil and bite), and custom fitted. Without question the custom fitted appliance which is made by a dentist is the preferred option. When this is not available the mouth formed mouthguard is preferable to the stock or preformed mouthguard. Any mouthguard that is used will only be effective if it is properly fitted and properly worn.

In the area of public education, Academy members are urged to play an active role in encouraging and assisting state and local youth sports organisations to become more active in the use of protective equipment, not only to prevent sports injuries but also to reduce health care costs.

Members of the Academy are encouraged to keep

abreast of developments in sports dentistry and medicine and to play an active role in those areas which require expertise and in which dentistry has already demonstrated effective action.

The Academy also encourages research toward the continuing development of a comfortable, effective, and cost effective sports mouthguard to facilitate more widespread use of this proven protective device.

1.16 PERIODICITY OF EXAMINATION, PREVENTIVE DENTAL SERVICES AND ORAL TREATMENT FOR CHILDREN

BIRTH – 12 MONTHS

- 1) The first oral examination should follow the eruption of the first primary tooth and no later than 12 months of age.
- 2) Complete the clinical oral exam following the eruption of the first tooth and perform appropriate diagnostic tests to assess oral growth and development and/or pathology
- 3) Provide oral hygiene counselling for parents, guardians and caregivers
- 4) Remove supra- and subgingival stains or deposits as indicated
- 5) Assess the child's total fluoride exposure status and make recommendations regarding use of systemic supplementation if appropriate
- 6) Assess appropriateness of feeding practices
- 7) Provide dietary counselling related to oral health
- 8) Provide injury prevention counselling for orofacial trauma (play objects, pacifiers, car seats, etc.)
- 9) Provide counselling for oral habits (digit, pacifiers, etc.)
- 10) Provide diagnosis and required treatment for any oral diseases or injuries
- 11) Provide anticipatory guidance for parent/guardian.

12-24 MONTHS

- 1) Repeat Birth -12 month procedures every six months or as indicated by individual patient's needs/susceptibility to disease
- 2) Re-assess the total fluoride exposure and give proper parental counselling
- 3) Assess the child's caries risk status in order to determine the frequency of review
- 4) Provide injury prevention counselling for orofacial trauma (learning to walk, run, etc.).

2-6 YEARS

- 1) Annual re-assessment of child's caries risk status and re-evaluation of frequency of review
- 2) Provide age-appropriate oral hygiene instruction
- 3) Complete radiographic assessment of pathology

and/or abnormal growth and development (including bitewings), should be taken as soon as possible in line with other AAPD Guidelines, as indicated for individual patient's needs

- 4) Early instruction with prophylaxis of the teeth and appropriate fluoride treatment every six months or as indicated by individual patient's needs
- 5) Provide pit and fissure sealants for primary and permanent teeth as indicated by individual patient's needs
- 6) Provide counselling and services (mouth guards) as needed for orofacial trauma prevention
- 7) Provide assessment/treatment or referral of developing malocclusion as indicated by individual patient's needs
- 8) Treat any oral diseases/habits/injuries as indicated.

6-12 YEARS

- 1) Regular reviews at appropriate time intervals in order to continually reassess disease risk status
- 2) Provide counselling and services (mouth guards) as needed for orofacial trauma prevention
- 3) Identify substance abuse and refer for appropriate counselling
- 4) Provide assessment/treatment or referral of developing malocclusion as indicated by individual patient's needs
- 5) Treat any oral diseases/habits/injuries as indicated

12+ YEARS

- 1) Regular reviews at appropriate time intervals in order to continually reassess disease risk status
- 2) Provide counselling and services (mouth guards) as needed for orofacial trauma prevention
- 3) Provide assessment/treatment or referral of developing malocclusion as indicated by individual patient's needs
- 4) Treat any oral diseases/habits/injuries as indicated.

1.17 STATEMENT ON ADOLESCENT ORAL HEALTH

Adolescence is a period of life marked by dramatic physiologic and emotional change. Today's adolescent faces a variety of health and behavioural challenges related to the impact of maturation, an evolving role in society and a developing sense of self. Adolescents have significant oral health concerns as well. The incidence of dental caries increases during adolescence, particularly amongst the poor and disadvantaged. Similarly this group has more missing permanent teeth, significant periodontal disease and untreated malocclusions.

Developmental and behavioural changes affect oral health. Rapid facial growth and the transition from mixed to adult dentition make this a period of significant occlusal change. The eruption of the adult dentition establishes the periodontal structures, which can only last a lifetime with

lifetime care. An important developmental task of adolescence is the assumption of responsibility for personal and professional oral health care.

The Australasian Academy of Paediatric Dentistry (Inc.) recognises the dynamic and pivotal nature of adolescence and its critical role in determining an individual's future oral health. Care of the adolescent is both the culmination of the paediatric dental health care continuum and the gateway to an adult lifetime of oral health.

Adolescents have important and unique oral health needs. The AAPD (Inc.) recommends regular professional care, fluoride therapy, sealants and dietary counselling. Of particular importance is the continuity of care of the adolescent through this period or appropriate referral for management of special needs. Such a comprehensive oral health programme can help assure that the adolescent dental patient enters adulthood with a dentition free of disease, a high dental self-esteem and well prepared for a lifetime of oral health.

2.1 GUIDELINES FOR THE ELECTIVE USE OF CONSCIOUS SEDATION, DEEP SEDATION AND GENERAL ANAESTHESIA IN PAEDIATRIC DENTAL PATIENTS

Some children and developmentally disabled patients will require conscious sedation, deep sedation or general anaesthesia in order to receive comprehensive dental care. Access to hospital based general anaesthesia may be limited for a variety of reasons, including restriction of coverage by certain insurance companies. Many paediatric dentists (and others who treat children) have sought to provide general anaesthesia in a hospital setting or other facilities.

GUIDELINES FOR THE ELECTIVE USE OF CONSCIOUS SEDATION

The following are all essential in order to minimise the risk for the patient:

- 1) Adequate facilities and equipment
- 2) Correct selection of pharmacological agents and dosages
- 3) Adequate monitoring and documentation
- 4) Patient selection and preoperative evaluation
- 5) Appropriately trained support personnel
- 6) Emergency medications, equipment and protocols.

CONSCIOUS SEDATION

Conscious sedation is a controlled, pharmacologically induced, minimally depressed level of consciousness that retains the patient's ability to maintain a patent airway independently and continuously and respond appropriately to physical stimulation and/or verbal command. The drugs, dosages, and techniques used should carry a margin of safety which is unlikely to render the child non-interactive and non-arousable.

DEEP SEDATION

Deep sedation is a controlled, pharmacologically-induced state of depressed consciousness from which the patient is not easily aroused and which may be accompanied by a partial loss of protective reflexes, including the ability to maintain a patent airway independently and/or respond purposefully to physical stimulation or verbal command.

GENERAL ANAESTHESIA

General anaesthesia is an induced state of unconsciousness accompanied by partial or complete loss of protective reflexes, including the ability to independently maintain an airway and respond purposefully to physical stimulation or verbal command.

Consequently, protection of the airway is required when providing treatment under general anaesthesia. Unless a specific contraindication is noted, nasal intubation is preferred for optimal access to the oral cavity.

GENERAL CONSIDERATIONS

GOALS OF SEDATION AND GENERAL ANAESTHESIA

The sedation of children for the delivery of oral health care is recognised as, and represents a unique clinical challenge. Consideration must be given to such factors as the patient's age and corresponding levels of cognitive and coping skills. Because of patient extremes in responsiveness and acceptability of treatment modalities, the intended goals and outcome of sedations will vary depending on a host of factors.

The goals of sedation in the paediatric dental patient are to

- 1) facilitate the provision of quality care
- 2) minimise the extremes of disruptive behaviour
- 3) promote a positive psychological response to treatment
- 4) promote patient welfare and safety
- 5) return the patient to a physiologic state in which safe discharge, as determined by recognised criteria, is possible. (See Appendix 2).

INDICATIONS FOR SEDATION AND GENERAL ANAESTHESIA

The Indications for conscious sedation include:

- 1) Preschool children who cannot understand or cooperate for definitive treatment
- 2) Patients requiring dental care who cannot cooperate due to lack of psychological or emotional maturity
- 3) Patients requiring dental treatment who cannot cooperate due to a cognitive, physical or medical disability
- 4) Patients who require dental care but are fearful and anxious and cannot cooperate for treatment

The indications for deep sedation and general anaesthesia in paediatric dental patients include:

- 1) Patients with certain physical, mental or medically compromising conditions
- 2) Patients with dental restorative or surgical needs for whom local anaesthesia is ineffective
- 3) The extremely uncooperative, fearful, anxious or physically resistant child or adolescent with substantial dental needs and no expectation that the behaviour will soon improve
- 4) Patients who have sustained extensive orofacial or dental trauma

- 5) Patients with dental needs who otherwise would not receive comprehensive dental care.

LOCAL ANAESTHESIA CONSIDERATIONS DURING SEDATION

All local anaesthetic agents can become cardiac and CNS depressants when administered in excessive doses. There is a potential interaction between local anaesthetic and sedatives used in paediatric dentistry, which can result in enhanced sedative effects and/or untoward events; therefore, particular attention should be paid to doses used in children. In order to avoid excessive doses for the sedated patient, a maximum recommended dose in mg/kg should be calculated. The dose administered should be recorded for each patient prior to administration for all sedatives and local anaesthetics.

FACILITIES AND EQUIPMENT

The practitioner who uses any type of sedative or local anaesthetic in the paediatric patient shall possess the appropriate training, skills and also have available the proper facilities, personnel, and equipment to manage any reasonable and foreseeable emergency that may arise. All newly installed facilities for delivering nitrous oxide and oxygen must be checked for proper gas delivery and fail-safe function prior to use. Where state law mandates equipment and facilities, such statutes shall supersede these guidelines.

The provision of deep sedation in children shall be performed by an anaesthetist or dentist with advanced training in deep sedation as mandated by the Australian & New Zealand College of Anaesthetists. In addition, general anaesthesia in children should only be performed by a registered anaesthetist or medical practitioner with the appropriate training and experience as mandated by the above mentioned College.

APPENDIX I

AMERICAN SOCIETY OF ANAESTHESIOLOGISTS CLASSIFICATION (MODIFIED)

- | | |
|------------|---|
| Class I. | A normal healthy patient with no organic, physiologic, biochemical or psychiatric disturbance or disease. |
| Class II. | A patient with mild-to-moderate systemic disturbance or disease. |
| Class III. | A patient with severe systemic disturbance or disease. |
| Class IV. | A patient with severe and life-threatening systemic disease or disorder. |
| Class V. | A moribund patient who is unlikely to survive without the planned procedure. |

APPENDIX 2

Appropriate emergency equipment should be available whenever sedative drugs, capable of causing cardiorespiratory and central nervous system depression, are administered.

The use of sedation in any form in Paediatric Dentistry

must be in accordance with the policy documents produced by the Australian and New Zealand College of Anaesthetists. Two main documents should be taken into account:

- 1) Sedation for Dental Procedures (Review Document P21) and,
- 2) Recommended Minimum Facilities for Safe Anaesthetic Practice in Dental Surgeries (Review Document T5).

Copies or reprints of any policy documents stated in these guidelines (and any other related policy documents) are available from the Registrar, Australian and New Zealand College of Anaesthetists, 630 St Kilda Road, Melbourne VIC 3004, or at the following website: <http://www.medeserv.com.au/anzca>

2.2 GUIDELINES FOR DENTAL HEALTH OF THE ADOLESCENT

Historically the adolescent has been perceived largely as a dental patient who experienced an increase in caries due to a greater intake of refined carbohydrates superimposed on unusually careless oral hygiene habits. Orthodontic management of malocclusion, if present, constituted the image of the delivery of special care for most adolescents.

Until recently, the special needs of adolescents have been either ignored or spread haphazardly between paediatric, restorative, and community dentistry disciplines. However as caries rates in children have declined, increasing numbers of parents prefer to have their children followed by the paediatric dentist. It has become apparent for the care of some adolescents, that the skills of the paediatric dentist (primary preventive care and patient management) are not only essential, but in many cases are indispensable (space maintenance, minor orthodontics, care of traumatic injuries).

It is the Academy's position that because of the unique nature of adolescent dental problems, the long-term health of the permanent dentition is more likely to be assured if the dental needs of the adolescent are under the care of the paediatric dentist.

Recognition of the adolescent today as a patient with special needs is due, in part, to the following factors:

- 1) a caries rate that continues to accelerate during adolescence;
- 2) modern knowledge about the pivotal nature of adolescence in periodontal disease;
- 3) the greater awareness of the extent of both treatment and preventive needs for hard and soft tissues within this group;
- 4) the complexity of care for the adolescent with combined orthodontic and restorative care;
- 5) dental phobia.

These guidelines address disease entities within the adolescent population and propose general guidelines for

their management.

DENTAL CARIES

Dental caries continues to be the major dental infectious disease problem for the adolescent. The incidence of dental caries still proceeds during adolescence but a small percentage (10 to 15 percent) of individuals account for approximately 80 per cent of the disease. The remainder have a low prevalence of caries, mostly being confined to the pits and fissures. The increased proportion of those at low risk is attributed to the positive effects of the use of fluorides, professional care, patient education and oral hygiene.

Immature permanent teeth and a total increase in susceptible surfaces contribute to the increased risk of the minority. Factors such as diet, independence to seek care (or avoid it) and a low priority for total hygiene also contribute to the increase in caries prevalence in certain groups of adolescence.

MANAGEMENT OF CARIES – PRIMARY PREVENTION

FLUORIDE

Fluoridation has proven the most economical and effective caries preventive measure and continual exposure has lifelong benefits. The topical benefits of remineralisation and antimicrobial activity still can be obtained through water fluoridation, professionally applied and prescribed compounds and fluoride dentifrices.

Recommendations

The adolescent should receive maximum fluoride benefit.

- 1) Fluoride intake via optimal fluoridation of drinking water or professionally prescribed supplements is recommended. Fluoride supplementation should follow NHMRC guidelines or the New Zealand Ministry of Health Guidelines.
- 2) Fluoride toothpaste is recommended.
- 3) Topical fluoride supplementation via home-applied products should be a professional recommendation when indicated by an individual's dental caries pattern or caries risk status
- 4) Regular professionally applied fluoride treatments should be deemed necessary through adolescence as during the early childhood period and based on the individual patient's caries pattern and fluoride status of the drinking water

ORAL HYGIENE

Tooth brushing with fluoride-containing dentifrice and flossing can help prevent dental caries and periodontal disease

Recommendation

Adolescents should be educated and motivated to maintain personal oral hygiene through daily plaque removal. Frequency and pattern of tooth cleaning should be based on the individual's disease pattern and oral hygiene needs. Flossing should be a part of an oral

hygiene program. Professional removal of plaque and calculus is a highly recommended procedure for the adolescent.

DIET MANAGEMENT

The role of carbohydrates in caries initiation is unequivocal. The adolescent can benefit from a diet analysis and modification when caries is a problem. Most adolescents are growing and active and have high-energy requirements.

Recommendation

Diet analysis, along with professionally determined recommendations for general and dental health, should be a part of an adolescent's dental health management. A diet analysis and management should consider:

- 1) dental disease patterns
- 2) overall nutrient and energy needs
- 3) psychosocial aspects of adolescent nutrition
- 4) dietary carbohydrate intake
- 5) wellness considerations
- 6) awareness of the erosive nature of carbonated drinks and sports drinks.

SEALANTS

Pit and fissure sealants can be of significant benefit to those whose dental caries affects mainly pits and fissures. The pits and fissures of second molars in adolescents are highly prone to caries attack. Sealants are an effective decay-preventive technique that should be used on an individual basis according to risk.

Recommendation

Adolescents should have pit and fissure sealants available as a caries preventive technique. Sealants should be professionally deemed necessary and, according to current standards, applied using criteria such as the caries history, current risk status and tooth surface anatomy. Previously placed sealants should always be reassessed and reapplied if necessary.

PROFESSIONAL CARE

Professional intervention for dental caries may find existing disease in its early stages. The adolescent patient who has not been seen by a dentist for a year or more may have advanced caries or periodontal disease urgently in need of professional evaluation and extensive treatment.

Recommendations

- 1) A dentist who is thoroughly trained in the special needs of the adolescent should professionally evaluate the adolescent dental patient.
- 2) Initial periodic radiographic examination should be a part of a clinical evaluation. The type, number, and frequency of films should be professionally determined only after oral examination and history taking. Previously exposed radiographs should be available for comparison. Special attention should be

given to the physiological status of the adolescent, and the potential of gonadal or foetal x-ray exposure in pregnant patients.

- 3) Periodic recall examination should be at a frequency which provides the most cost-effective disease preventive benefit to the adolescent and consider the dynamics of the disease processes.

PERIODONTAL DISEASES

Adolescence appears to be a critical period in periodontal status for the human. Epidemiologic and immunologic data suggest that irreversible tissue damage from periodontal disease begins in late adolescence and early adulthood. Pubertal changes characteristically affect the periodontium of the young adolescent with an increase in inflammation, which is, in most cases, manageable through oral hygiene and regular professional care. The adolescent also is prone to a number of acute periodontal conditions, which require immediate and occasional long-term management, although this is only a small percentage of the population.

For classification and treatment guidelines refer to sections 2.11 Periodontal Diseases of Children and Adolescents and 2.12 Guidelines for Periodontal Therapy in Children and Adolescents.

OCCLUSAL PROBLEMS

Malocclusion remains a significant treatment need in the adolescent population. Both environmental and genetic aetiologic factors come into play. Although the genetic basis of much malocclusion makes it unpreventable, numerous treatment methods exist to treat the occlusal disharmonies, temporomandibular joint dysfunction, periodontal disease and disfiguration, which may be caused by malocclusion. With the area of occlusal problems are several tooth/jaw related disorders, which can affect the adolescent. Third molar malposition and temporomandibular disorders are not infrequent in adolescents and require special attention to avoid long-term problems. Congenitally missing teeth present complex problems for the adolescent and often require combined orthodontic and restorative care for satisfactory resolution.

MALOCCLUSION

Any tooth/jaw positional problems which present significant aesthetic, functional, physiologic, or emotional dysfunction are potential difficulties for the adolescent. These can include single or multiple tooth malpositions, tooth/jaw size discrepancies, and craniofacial disfigurements. Treatment of malocclusion and related problems should be performed by an appropriately trained dentist.

RECOMMENDATION

Any malposition of teeth, malrelationship of teeth to jaws, tooth/jaw size discrepancy, bimaxillary malrelationships, or craniofacial malformations or disfigurement which presents functional, aesthetic, emotional, or physiologic

problems to the adolescent should be evaluated by the appropriately trained dentist or professional team. Treatment of malocclusion should be based on professional diagnosis, available treatment options, patient motivation and readiness, and other factors to maximise prognosis.

THIRD MOLARS

Third molars can present acute and chronic problems for the adolescent. Impaction or malposition leading to such problems as pericoronitis, caries, cysts, or periodontal problems merit evaluation for removal. The role of the third molar as a functional tooth also has to be considered.

RECOMMENDATION

Evaluation of third molars should be an integral part of the dental examination of the adolescent. This evaluation should include radiographic diagnostic aids. Third molars, which are determined to be potential or active problems, should be considered for treatment by the appropriately trained dentist. Diagnostic criteria for extraction should be those currently accepted by the dental profession.

TEMPOROMANDIBULAR JOINT PROBLEMS

Disorders of the temporomandibular joint can occur at any age, but adolescence may provide the stimulus to trigger these problems.

RECOMMENDATION

Evaluation of the temporomandibular joint and related structures should be a part of the examination of the adolescent. Abnormalities should be managed by an appropriately trained dentist.

Refer to Section 2.7

CONGENITALLY MISSING TEETH

The impact of a congenitally missing permanent tooth on the developing dentition can be significant. Attention should be given to both immediate and long-term management of such problems no later than adolescence.

RECOMMENDATION

Evaluation of congenitally missing permanent teeth should be done no later than adolescence. Treatment planning should include both immediate and long-term management

SPECIAL CONSIDERATIONS IN MANAGEMENT OF ORAL PROBLEMS IN ADOLESCENCE

The adolescent can present particular psychosocial characteristics, which impact on the health status of the oral cavity as well as care seeking and compliance. The

self-concept development process, emergence of independence, and the effects of peers are just a few of the psychodynamic factors impacting on dental health during this period.

Behaviour management of the adolescent may require dealing with anxiety, phobia, or intellectual dysfunction. These special needs patients should receive attention to these aspects of their care by appropriately trained dentists. Referral to non-dental professionals or a team approach may be indicated.

Specific examples of oral problems associated with adolescent behaviours include, but are not limited to:

- 1) oral manifestations of venereal diseases
- 2) effects of tobacco (leukoplakia, tissue damage from smokeless tobacco)
- 3) effects of oral contraceptives on periodontal structures
- 4) perimyolysis in anorexia nervosa
- 5) traumatic injury to teeth and oral structures in athletic or other activities (short and long-term management)

The impact of psychosocial factors relating to oral health must include consideration of the following:

- 1) changes in dietary habits (fads, freedom to snack, increased energy needs, access to carbohydrates)
- 2) use and abuse of drugs
- 3) motivation for maintenance of good oral hygiene
- 4) potential for traumatic injury
- 5) adolescent as responsible for care (age of majority)
- 6) lack of knowledge about periodontal disease.

RECOMMENDATIONS:

- 1) The adolescent's dental health care should be provided by a dentist who has appropriate training in awareness and management of the specific needs of this patient. The general dentist should consider referral to a specialist for treatment of particular problems outside his or her expertise. This may include both dental and non-dental problems.
- 2) Attention should be given to the particular psychosocial aspects of adolescent dental care issues including consent, confidentiality and compliance.
- 3) A complete oral health care programme for the adolescent requires an educational component which addresses the particular problems of this group. This programme should focus on the specific behavioural and physiologically induced oral manifestations and lead to the shared responsibility for care and health by the adolescent and the provider.

2.3 GUIDELINES FOR MANAGEMENT OF THE DEVELOPING DENTITION IN PAEDIATRIC DENTISTRY

INTRODUCTION

Paediatric dentists have the responsibility to recognise, differentiate, and either appropriately manage or refer abnormalities in the developing dentition as dictated by the complexity of the problem and the individual clinician's training, knowledge, and experience. Early diagnosis and successful treatment of developing malocclusions can have both short-term and long-term benefits to the child.

The variables associated with the treatment of the developing dentition which can affect the success of treatment include, but are not limited to

- 1) Craniofacial configuration.
- 2) Variations in craniofacial growth.
- 3) Concomitant systemic disorder.
- 4) Accuracy of the diagnosis.
- 5) Appropriateness of the treatment.
- 6) The chronological, mental and/or emotional age of the child which affects their ability to understand and co-operate with the treatment.
- 7) Compliance of the child with clinician's instructions.
- 8) Parental support and compliance.
- 9) Intensity, frequency and duration of an oral habit.

Many unpredictable factors can affect the management of the developing dental arches and minimise the success of any treatment. These factors cannot always be controlled by the clinician. Appropriate pre-treatment records may vary but they should include those deemed necessary to adequately diagnose the child's problem. They should include

- 1) Facial analysis to:
 - a) determine the growth patterns of the maxilla and mandible and/or lateral deviations of the mandible
 - b) determine disproportionate vertical growth patterns dentally and skeletally and skeletal and dental transverse asymmetries including lateral deviations of the mandible
 - c) assess relative dental and skeletal anteroposterior contributions to the occlusal relationship.
- 2) Intraoral examination to:
 - a) assess overall oral health status
 - b) determine the functional status of the occlusion.
- 3) Functional analysis to:
 - a) determine functional factors associated with the malocclusion
 - b) detect detrimental habits
 - c) detect temporomandibular joint dysfunction which may require additional diagnostic procedures.
- 4) Diagnostic Records may include:
 - a) Extraoral and intraoral photographs to:
 - i) record and supplement clinical findings
 - ii) allow treatment changes to be assessed.

- b) Diagnostic dental casts to:
 - i) assess the occlusal relationship
 - ii) determine arch length requirements for intra-arch tooth size relationships
 - iii) determine arch length requirements for inter-arch tooth size relationships
 - iv) determine location and extent of arch asymmetry
 - v) assist in treatment planning e.g. diagnostic wax-up.
- c) Intraoral and panoramic radiographs to:
 - i) establish dental age
 - ii) assess eruption problems
 - iii) estimate the number, size and presence of unerupted teeth
 - iv) identify dental anomalies.
- d) Lateral and A-P cephalograms and their analysis to:
 - i) produce a comprehensive cephalometric analysis of the relative dental and skeletal components in the anteroposterior, vertical and transverse dimensions
 - ii) establish a baseline growth record for longitudinal assessment of growth and displacement of the jaws.
- 5) Diagnostic summary to:
 - a) establish the relative contributions of the dental and skeletal structures to the malocclusion
 - b) prioritise problems in terms of relative severity
 - c) detect favourable and unfavourable interactions that may result from different treatment options
 - d) establish short-term and long-term objectives
 - e) summarise the prognosis of treatment for achieving stability, function and aesthetics.
- 6) Treatment plan schedule to:
 - a) establish timing priorities for each phase of therapy
 - b) establish proper timing and sequence of therapy to achieve short-term and long-term objectives
 - c) determine the progressive results of treatment and so to evaluate the protocol on a regular basis.

MANAGEMENT OF ORAL HABITS

Oral habits include but may not be limited to:

- 1) Digit sucking
- 2) Lip or cheek sucking
- 3) Posturing habits
- 4) Abnormal swallowing
- 5) Oral self-mutilation.

The identification and assessment of an abnormal habit and an assessment of its immediate and long-term effects on the craniofacial complex and dentition should be made

as early as possible. However, it is recognised that this identification and assessment are often difficult to make due to the wide degree of expression of the habit and the deleterious effects. The treatment must be appropriate for the child's development, comprehension and degree of compliance.

Treatment modalities may include:

- 1) Psychological counselling
- 2) Appliance therapy
- 3) Referral to other dental or medical specialist.

TREATMENT INDICATIONS

Management of an oral habit is indicated whenever the habit is causing damage or that the oral habit may result in unfavourable sequelae in the permanent dentition.

TREATMENT OBJECTIVES

Treatment should result in a decrease or elimination of the habit and of the deleterious effects of the habit or those that it potentially might have upon the child's craniofacial complex and dentition.

SPACE MAINTENANCE

When primary or permanent teeth are lost prematurely or are broken down in a mesio-distal dimension, the integrity of the arch is lost, so there is loss of space and arch length. The resulting migration of primary and/or permanent teeth can cause some degree of crowding in the permanent dentition.

TREATMENT INDICATIONS

The premature loss of primary molars may require the placement of a space maintainer to prevent the migration of adjacent teeth, depending upon the teeth present, the arch length and dental age of the child.

The premature loss of primary anterior teeth does not routinely require the placement of a space maintainer because mesial movement of adjacent teeth is not generally expected. However, the replacement of primary anterior teeth for aesthetic reasons, to facilitate normal speech development and prevent a shift of the centre line may be indicated.

TREATMENT MODALITIES

May include, but are not limited to the following

- 1) Fixed maintainers
 - a) band and loop, or crown and loop
 - b) lingual arch
 - c) Nance type appliance
 - d) transpalatal arch.
- 2) Removable appliances
 - a) partial dentures, with or without teeth
 - b) Hawley type appliance.

The placement and retention of space-maintaining appliances requires a high degree of compliance on behalf of the child. Any appliance should continue to function

until the succedaneous teeth have assumed their normal position in the dental arch and should not prevent or interfere with their eruption.

DIAGNOSIS AND PREVENTION OF CROWDING

Crowding is a characteristic feature of a significant number of classes of malocclusions. Less than two millimeters of mandibular incisor crowding in the mixed dentition may be considered to be a normal transitional condition. The crowding must be considered in the context of the child's and parent's complaint and the dental, skeletal, and soft tissue inter-relationships.

Hence, assessment using comprehensive diagnostic records is recommended, with evaluation of such variables as direction and pattern of growth, facial profile, facial width, muscle balance, tooth position and study model analyses. The constellation of problems identified may require a comprehensive treatment plan and may include multiple phases of treatment. During treatment, progress re-evaluations are advisable.

INDICATIONS

When the diagnosis indicates that the crowding is unlikely to self-correct or become minimal with anticipated growth and development, intervention may be warranted. The appropriate treatment may be as simple as preservation of the leeway space.

When incisor crowding is considerably greater than the available leeway space, then expansion of the arch or extraction of teeth may be considered as a treatment option.

In all cases when treatment is undertaken comprehensive records should be prepared and retained.

OBJECTIVES

To obtain appropriate arch form and to eliminate crowding.

Long-term prognosis is based upon the success of the treatment provided and the retention requirements of the individual.

SPACE REGAINING IN A COMPROMISED POSTERIOR SEGMENT

Some of the commoner causes of space loss within an arch are multiple interproximal carious lesions in the primary teeth, ectopically erupting teeth, alteration in the sequence of tooth eruption, ankylosis of a primary molar, impaction of teeth, transposition of teeth, premature loss of primary molars, abnormal resorption of the roots of primary molars, premature and delayed eruption of permanent teeth, abnormal tooth morphology, hypodontia and hyperdontia; also tipping, rotation, extrusion and transposition of teeth. It may also occur as a result of extrusion of teeth and the deepening of the curve of Spee. The space loss may be unilateral or bilateral.

The degree to which space is affected varies according to the individual arch, the site in the arch and the time elapsed since tooth loss. The quantity and incidence of space loss is also dependent upon which adjacent teeth are present in the dental arch and their status.

The amount of crowding or spacing in the dental arch will determine the extent of the consequences on that arch. In a crowded dental arch, space loss of 1-3mm might be sufficient to require the future extraction of permanent teeth to achieve a desirable occlusion. Alternatively, in an arch with excessive spacing, the premature loss of a primary molar will probably have minimal effects.

Treatment may be accomplished by using fixed or removable appliances. The treatment outcome is highly dependent upon the child's compliance, especially when removable and extraoral appliances are employed.

TREATMENT INDICATIONS

Loss of space in the dental arch that will adversely affect the eruption of the permanent teeth into a desirable position in the dental arch requires that the necessary space should be regained and then maintained until the succedaneous permanent teeth have erupted into the dental arch or additional treatment is instituted. Space loss and dentofacial skeletal development may dictate that space regaining may not be indicated. The timing of clinical intervention subsequent to premature loss of a primary molar is critical.

OBJECTIVES

Therapy to regain space should result in increased arch length, and/or circumference, and/or improved position of erupting succedaneous teeth. Space regained should be maintained until eruption of adjacent permanent teeth and/or until initiation of a subsequent phase of comprehensive orthodontic treatment.

ANTERIOR AND POSTERIOR CROSSBITES

There are three types of crossbite:

- 1) Skeletal
- 2) Dental
- 3) Functional

Skeletal crossbites involve disharmony of the craniofacial skeleton. Aberrations in skeletal growth may give rise to crossbites in two ways:

- 1) asymmetric growth of the maxilla and mandible
- 2) lack of equal growth in length and/or width of the maxilla and/or mandible.

Such growth aberrations can be due to inherited growth patterns, trauma or functional disturbances.

Dental crossbites usually involve only the tipping of a tooth or teeth, so the condition is localized and does not involve the basal bone.

Functional crossbites are produced by a shifting of the mandible to achieve occlusion because of an interference which prevents the achieving of a normal occlusion.

TREATMENT INDICATIONS

Crossbites should be considered in the context of the child's total treatment needs. Correction of an anterior crossbite can reduce attrition, improve aesthetics, improve the dento-alveolar relationship, increase arch perimeter and eliminate functional shifts. Posterior crossbite correction can accomplish the same objectives and improve the eruptive position of the permanent succedaneous teeth. Treatment can be completed with either fixed or removable appliances. Therapy depends on the amount and type of movement (tipping, bodily movement, rotation, or orthopaedics); space available; anteroposterior, transverse, and vertical skeletal relationships; and growth status.

PRIMARY DENTITION

An anterior crossbite sometimes warrants correction with appliance therapy, but other factors influence the treatment decision. If the anterior permanent teeth are about to erupt, in some instances, early extraction of selected primary teeth can have a therapeutic effect. Functional shifts should be eliminated as early as the patient can tolerate treatment. A posterior crossbite also may warrant correction with appliance therapy and/or selective grinding of the interfering teeth which are responsible for causing the functional shift of the mandible.

Patients with Class III skeletal patterns and/or skeletal asymmetry should receive comprehensive treatment by, or in collaboration with an orthodontist.

MIXED DENTITION

Anterior crossbites, especially those with a functional shift in the mixed dentition stage and posterior crossbites usually warrant correction with appliance therapy. Patients with crossbites and concomitant Class III skeletal patterns and/or skeletal asymmetry should receive comprehensive treatment, by, or in collaboration with an orthodontist.

PERMANENT DENTITION

Anterior crossbites and posterior crossbites in the permanent dentition usually warrant correction with appliance therapy. Crossbites that result from true facial asymmetry and concomitant Class III skeletal patterns and/or skeletal asymmetry should receive comprehensive evaluation and subsequent treatment by, or in collaboration with the appropriate specialist.

PROGNOSIS

The prognosis of crossbite correction in children is usually good. The more the problem is due to dental factors and the less the skeletal contribution, the better the prognosis. Both anterior and posterior crossbites should be overcorrected with the appliance of choice prior to retention. The amount of overcorrection and the duration of the retention depends upon the nature of the overbite and overjet achieved by the treatment. Retention and post-treatment observation can be indicated for both dental and skeletal types of crossbite

correction. The long-term prognosis depends upon the patient's compliance with retention and the pattern of future growth.

OBJECTIVES

Treatment of a crossbite should result in an improvement in intramaxillary alignment and an acceptable interarch relationship of the teeth.

CLASS II MALOCCLUSION

Class II malocclusion (distocclusion) may be unilateral or bilateral and involves a distal relationship of the mandible with respect to the maxilla. The dental relationship may be unilateral or bilateral and may be dental, the result of malposition of the teeth in the arches; or skeletal, the result of asymmetric or abnormal growth of the mandible and/or maxilla.

TREATMENT INDICATIONS

Treatment of Class II malocclusions is indicated to provide psychosocial benefits for the child by reducing or eliminating facial disfigurement, to lessen the risk of injury to permanent anterior teeth and to reduce the severity of the malocclusion by promoting harmonious growth.

OBJECTIVES

Treatment of a developing Class II malocclusion should result in an improved overbite and overjet with the appropriate intercuspation of the permanent dentition and an aesthetic appearance and profile compatible with the skeletal base.

REFERRAL CONSIDERATIONS

Appropriate referral should be initiated and documented in instances in which the treatment required by a patient is of a complexity that is beyond the expertise of the paediatric dentist.

CLASS III MALOCCLUSION

There are two types of Class III malocclusion

- 1) Skeletal
- 2) Dental

Class III malocclusion (mesiocclusion) may be unilateral or bilateral and involve a mesial relationship of the mandible to the maxilla. The mesial relationship may be unilateral or bilateral and may be dental; the result of malposition of the teeth in the arches; or skeletal, the result of asymmetric or abnormal growth of the mandible and/or maxilla.

TREATMENT INDICATIONS

Treatment of Class III malocclusions is indicated to provide psychosocial benefits for the child by reducing or eliminating facial disfigurement and to reduce the severity of the malocclusion by promoting harmonious growth.

OBJECTIVES

Treatment of a developing Class III malocclusion should result in an improved overbite and overjet with

appropriate intercuspation of the permanent dentition and an aesthetic appearance and profile compatible with the child's skeletal base.

REFERRAL CONSIDERATIONS

Appropriate referral should be initiated and documented in instances in which the treatment required by a child is of a complexity beyond the training, knowledge and/or experience of the paediatric dentist.

2.4 GUIDELINES FOR BEHAVIOUR MANAGEMENT

INTRODUCTION

Behaviour management methods in paediatric dentistry are directed toward the goals of communication and education. The relationship between the dentist and child is built through a dynamic process of dialogue, facial expression and voice tone; all methods of delivering a message. Some of the methods in this document are established and intended to maintain the communication process, while others are intended to extinguish inappropriate behaviour and teach the child how to cooperate in the dental setting. As such, the behaviour management methods in this document cannot be evaluated on an individual basis as to validity, but must be evaluated within the context of the child's total dental experience.

Behaviour management is as much a clinical skill as it is a science. It is not an application of individual techniques created to "deal" with children, but rather a comprehensive methodology meant to develop a relationship between patient and dentist which ultimately builds trust and allays fear and anxiety. Dental practitioners are encouraged to perform behaviour management consistent with their educational training and clinical experience.

Every dental practitioner treating children is expected to recognise and effectively treat childhood dental diseases that are commonplace and within the skills acquired by graduates of dental schools. Behaviour management cases that are beyond the training, experience, and expertise of individual practitioners should be referred to practitioners who can render care more appropriately.

OVERVIEW

Maintaining compliance of children in the dental environment demands skills of verbal guidance, expectation setting, extinction of inappropriate behaviour and reinforcement of appropriate responses. Since children exhibit a range of development and a diversity of attitudes, it is important that dentists have at their disposal a wide range of behaviour management methods and communication techniques to meet the needs of the individual child. This document contains definitions, objectives, indications, and contraindications for behaviour management methods which are deemed useful in paediatric dentistry.

These guidelines are based on the prescribed use of behaviour management techniques as documented in the dental literature and on the professional standards of both the academic and practicing paediatric dental community.

Two objectives of behaviour management are to perform treatment effectively and efficiently for the child and to instill in the child a positive dental attitude. These objectives must be the emphases of any practitioner who treats children. Achievement of these objectives relies on the foundations of behaviour management: communication and education.

Behaviour management is a continuum of interaction with the child directed toward communication and education in an endeavor to allay anxiety and fear and to promote an understanding of not only the need for good dental health but also the process by which it is achieved.

Unfortunately, many barriers hinder the achievement of these ambitious goals. The causes of inappropriate behaviour of a child in the dental setting are varied. Developmental delay, mental retardation, and acute or chronic disease all are obvious reasons for noncompliance. Reasons for noncompliance in the communicating child often are more subtle and difficult to diagnose. Major contributing factors, however, can be identified. Fears transmitted from parents, a child's prior experience with a dentist not adept at relating to children, or an unprepared child's first encounter in the dental environment can lead to a child's uncooperative behaviour. In order to alleviate these barriers, the dentist becomes a teacher. The dentist's methodology should include good communication, analysis of the patient's developmental level and comprehension skills, a message directed to that level, and a patient who is attentive to the message being delivered. In order to accomplish good dental treatment and to develop an educated patient, it is mandatory that the "teacher-student" roles and relationship be established and maintained.

Decisions regarding intended treatment are often complex. The child who presents with significant pathology and noncompliance tests the skills of every practitioner. A dentist treating children should have a variety of behaviour management approaches and should, under most situations, be able to assess accurately the child's developmental level, dental attitudes, and predict the child's reaction to the choice of treatment. However, by virtue of each practitioner's differences in training, experience and personality, a behaviour management approach for a child may vary from practitioner to practitioner. Regardless of the variation in behaviour management methods utilised by each individual practitioner, all management decisions must be based on an evaluation weighing benefit and risk to the child. Considerations regarding need of treatment, consequences of deferred treatment and potential physical/emotional trauma must be entered into the decision-making equation. The evaluation of risk and benefit to a child is subjective.

INFORMED CONSENT

Decisions regarding treatment of children cannot be made unilaterally by the dentist. Decisions must involve parents and, if appropriate, the child. The dentist serves as the expert about dental matters, the need for treatment and the methods by which treatment can be carried out. The parent shares with the practitioner the decision whether to treat or not to treat and must be consulted regarding treatment strategies and potential risks. Therefore, the successful completion of diagnostic and therapeutic services is viewed as a partnership of dentist, parent and child. Although the behaviour management methods included in this document are used frequently, parents may not be entirely familiar with some of them. It is important that the dentist inform the parent (or legal guardian) about the use of the method, indications, contraindications, significant risks, and alternate treatments, and that all questions are answered before the method is used. Except for communicative management methods (see below) which, by virtue of being basic elements of communication, require no specific consent, informed consent must be obtained and should be documented before anticipated use of behaviour management methods. In addition, an emergent situation may arise which necessitates use of a technique before consent can be obtained to avoid immediate injury to the patient, doctor, and/or staff, and consent is then implied.

SUMMARY

- 1) Behaviour management is based upon scientific principles, but the proper implementation by the dental practitioner requires more than just understanding principles. It requires skills in communication, empathy, coaching and listening. Therefore, the implementation of a behaviour management strategy becomes a clinical skill which is obviously observable but defies complete explanation.
- 2) The goals of behaviour management are to achieve good dental health in the child patient and to help develop the child's positive attitude toward dental health.
- 3) The objectives of behaviour management are to establish communication and to foster education, thereby alleviating fear and anxiety and building a trusting relationship between dentist and child.
- 4) All decisions regarding behaviour must be based on a benefit versus risk evaluation.
- 5) Parents share in the decision-making process regarding treatment of their children.

COMMUNICATIVE MANAGEMENT

INTRODUCTION

Communicative management is used universally in pediatric dentistry with both the cooperative and uncooperative child. It comprises the most fundamental form of behaviour management. Communicative management is the basis for establishing a relationship with the child which may allow the successful completion

of dental procedures and, at the same time, may help the child develop a positive attitude towards dental care. Communicative management is an ongoing process rather than a technique. It is a subjective process and an extension of the personality and skills of the dentist. Associated with this process are the specific techniques of voice control, distraction, positive reinforcement, tell-show-do, and non-verbal communication. Since these comprise basic elements of communication and since they are widely used and widely accepted, they are appropriate for all patients. In addition, no specific consent or documentation is necessary prior to use.

VOICE CONTROL

Description

Voice control is a controlled alteration of voice volume, tone, or pace to influence and direct the patient's behaviour.

Objectives

- 1) To gain the patient's attention and compliance
- 2) To avert negative or avoidance behaviour
- 3) To establish authority.

Indications

May be used with any patient.

Contraindications

None.

NONVERBAL COMMUNICATION

Description

Nonverbal communication is the reinforcement and guiding behaviour through contact, posture, and facial expression.

Objectives

- 1) To enhance the effectiveness of other communicative management techniques
- 2) To gain or maintain the patient's attention and compliance.

Indications

May be used with any patient.

Contraindications

None.

TELL-SHOW-DO

Description

Tell-show-do is a method of behaviour shaping used by many professionals who work with children. The method involves verbal explanations of procedures in phrases appropriate to the developmental level of the patient (Tell); demonstrations for the patient of the visual, auditory, olfactory, and tactile aspects of the procedure in a carefully defined, non-threatening setting (Show); and then, without deviating from the explanation and demonstration, completion of the procedure (Do). The tell-show-do method is used with communication skills (verbal and nonverbal) and positive reinforcement.

Objectives

- 1) To teach the patient important aspects of the dental visit and familiarise the patient with the dental setting.
- 2) To shape the patient's response to procedures through desensitisation and well-described expectations.

Indications

May be used with any patient.

Contraindications

None.

POSITIVE REINFORCEMENT

Description

In the process of establishing desirable patient behaviour, it is essential to give appropriate feedback. Positive reinforcement is an effective method to reward desired behaviours and thus strengthen the recurrence of those desired behaviours. Social reinforcers include positive voice modulation, facial expression, verbal praise, and appropriate physical demonstrations of affection by all members of the dental team. Nonsocial reinforcers include tokens and toys.

Objective

To reinforce desired behaviour.

Indications

May be useful for any patient.

Contraindications

None.

DISTRACTION

Description

Distraction is the technique of diverting the patient's attention from what may be perceived as an unpleasant procedure.

Objective

To decrease the perception of unpleasantness.

Indications

May be used with any patient.

Contraindications

None.

PARENTAL PRESENCE/ABSENCE

Introduction

A wide diversity exists in practitioner philosophy and parental attitude regarding parents' presence or absence during paediatric dental treatment. Practitioners are united in the fact that communication between dentist and child is paramount and that this communication demands focus on the part of both parties. Children's responses to their parents' presence or absence can range from very beneficial to very detrimental.

It is the responsibility of each practitioner to determine

the communication methods that best optimise the treatment setting recognising his/her own skills, the abilities of the particular child, and the desires of the specific parent involved.

Description

This technique involves using the presence or absence of the parent to gain cooperation for treatment.

Objectives

- 1) To gain the patient's attention and compliance.
- 2) To avert negative or avoidance behaviours.
- 3) To establish authority.

TREATMENT IMMOBILISATION

Introduction

The need to diagnose and treat as well to protect the safety of the patient, practitioner, and staff should be considered for the use of immobilisation. Partial or complete immobilisation of the patient sometimes is necessary to protect the patient, practitioner, and/or the dental staff from injury while providing dental care. Immobilisation can be performed by the dentist, staff, or parent, with or without the aid of an immobilisation device.

The decision to use patient immobilisation should take into consideration

- 1) Other alternate behavioural modalities
- 2) Dental needs of the patient
- 3) Quality of dental care
- 4) Patient's emotional development
- 5) Patient's physical considerations
- 6) Regional regulations on child immobilisation.

Parental or guardian informed consent must be obtained and should be documented when immobilisation use is anticipated. A narrative description of the use of immobilisation should be included in the patient record. This description may include

- 1) Informed consents
- 2) Type of immobilisation used
- 3) Indication for immobilisation
- 4) The duration of application.

Objectives

- 1) To reduce or eliminate untoward movement
- 2) To protect patient and dental staff from injury
- 3) To facilitate delivery of quality dental treatment.

Indications

- 1) A patient who requires diagnosis and/or treatment and cannot cooperate due to lack of maturity
- 2) A patient who requires diagnosis and/or treatment and cannot cooperate due to mental or physical disability
- 3) A patient who requires diagnosis and/or treatment and does not cooperate after other behaviour management techniques have failed

- 4) When the safety of the patient and/or practitioner would be at risk without the protective use of immobilisation.

Contraindications

- 1) A cooperative patient
- 2) A patient who cannot be immobilised safely due to underlying medical or systemic conditions.

NITROUS OXIDE/OXYGEN INHALATION SEDATION

Introduction

Nitrous oxide/oxygen inhalation sedation is a conscious sedation technique which is a safe and effective behaviour management adjunct to the treatment of selected dental patients. Its onset of action is fast, its depth of sedation is easily titrated, and recovery is rapid and complete.

Additionally, the technique provides a variable degree of analgesia for some patients. The need to diagnose and treat as well as the safety of the patient and practitioner must justify the use of nitrous oxide. The decision to use nitrous oxide must take into consideration

- 1) Alternative behavioural management modalities
- 2) Dental needs of the patient
- 3) Quality of dental care
- 4) Patient's emotional development
- 5) Patient's physical considerations.

Parental or guardian consent must be obtained and should be documented prior to use of nitrous oxide.

The patient's record should include

- 1) Informed Consent
- 2) Indication for use
- 3) Nitrous oxide dosage:
 - a) Per cent nitrous oxide/oxygen and/or flow rate
 - b) Duration of the procedure.

Objectives

- 1) To reduce or eliminate anxiety in dental patients so safe, comfortable, quality dental treatment can be rendered
- 2) To reduce untoward movement and reaction to dental treatment
- 3) To enhance communication and patient cooperation
- 4) To raise the pain reaction threshold
- 5) To increase tolerance for longer appointments
- 6) To aid in treatment of the mentally, physically, or medically compromised patient
- 7) To reduce gagging.

Indications

- 1) A fearful, anxious or obstreperous patient
- 2) Certain mentally, physically or medically compromised patients
- 3) A patient whose gag reflex interferes with dental care
- 4) A patient for whom profound local anaesthesia cannot be obtained.

Contraindications

- 1) May be contraindicated in some chronic obstructive pulmonary diseases
- 2) May be contraindicated in certain patients with severe emotional disturbances or drug-related dependencies
- 3) Patients in the first trimester of pregnancy
- 4) Patients with drug-induced or disease-induced pulmonary fibrosis.

CONSCIOUS SEDATION

Introduction

Conscious sedation can be used safely and effectively with patients unable to receive dental care for reasons of age or mental, physical or medical condition. Background information and documentation for the use of conscious sedation is detailed in the "American Academy of Pediatric Dentistry Guidelines for the Elective Use of Pharmacologic Conscious Sedation and Deep Sedation in Pediatric Dental Patients."

The need to diagnose and treat, as well as the safety of the patient, practitioner and staff, should be considered for the use of conscious sedation. The decision to use conscious sedation must take into consideration

- 1) Alternative behavioural management modalities
- 2) Dental needs of the patient
- 3) Quality of dental care
- 4) Patient's emotional development
- 5) Patient's physical considerations.

Parental or guardian informed consent must be obtained and should be documented prior to the use of conscious sedation.

Objectives

- 1) To reduce or eliminate anxiety in dental patients so that safe, comfortable, quality dental treatment can be rendered
- 2) To reduce untoward movement and reaction to dental treatment
- 3) To enhance communication and patient cooperation
- 4) To increase tolerance for longer appointments
- 5) To aid in treatment of the mentally, physically or medically compromised patient.

Indications

- 1) Patients who are ASA Class I or II (See section 2.1 Appendix 1)
- 2) Patients requiring dental care who cannot cooperate due to a lack of psychological or emotional maturity
- 3) Patients requiring dental care who cannot cooperate due to a mental, physical or medical disability
- 4) Patients requiring dental care for whom the use of sedation may protect the developing psyche.

Contraindications

- 1) The cooperative patient with minimal dental needs

- 2) Medical contraindication to sedation.

GENERAL ANAESTHESIA

Introduction

The use of general anaesthesia sometimes is necessary to provide quality dental care for the child. Depending on the patient, this can be done in an ambulatory care setting, a same day surgery centre, an out-patient surgery area of a hospital or an in-patient hospital setting with the use of pre- and/or postoperative patient admission to the hospital.

General anaesthesia is a controlled state of unconsciousness accompanied by a loss of protective reflexes, including the ability to maintain an airway independently and respond purposefully to physical stimulation or verbal command.

The need to diagnose and treat, as well as the safety of the patient, practitioner and staff should be considered for the use of general anaesthesia. The decision to use general anaesthesia should take into consideration

- 1) Alternative behaviour management modalities
- 2) Patient's dental needs
- 3) Quality of dental care
- 4) Patient's emotional development
- 5) Patient's physical considerations
- 6) Patients requiring dental care for whom the use of general anaesthesia may protect the developing psyche.

Parental or guardian informed consent must be obtained and should be documented prior to the use of general anaesthesia.

The patient's record should include

- 1) Informed consent,
- 2) Indication for the use of general anaesthesia.

Objectives

To provide safe, efficient and effective dental care.

Indications

- 1) Patients with certain physical, mental or medically compromising conditions
- 2) Patients with dental needs for whom local anaesthesia is ineffective because of acute infection, anatomic variations or allergy
- 3) The extremely uncooperative, fearful, anxious or uncommunicative child or adolescent with dental needs deemed sufficiently important that dental care cannot be deferred
- 4) Patients who have sustained extensive orofacial and dental trauma
- 5) Patients with dental needs who otherwise would not obtain necessary dental care
- 6) Patients requiring dental care for whom the use of general anaesthesia may protect the developing psyche.

Contraindications

- 1) A healthy, cooperative patient with minimal dental needs
- 2) Medical contraindication to general anaesthesia.

REFERENCES

- Levy RL, Domoto PK: Current techniques for behaviour management, a survey. *Pediatr Dent* 1:160–64, 1979.
- Murphy MG, Fields HW Jr, Machen JB: Parental acceptance of pediatric dentistry behaviour management techniques. *Pediatr Dent* 6:193–98, 1984.
- Weinstein P, Getz T, Ratener P, Domoto P: The effect of dentists' behaviours on fear-related behaviours in children. *J Am Dent Assoc* 104:32–38, 1982.
- Galsrud PH, Feigal RJ: Child life and children's dentistry: Broadening our Scope of Concern. *Child Health Care* 12:143–47, 1984.
- Winer GA: A review and analysis of children's fearful behaviour in dental settings. *Child Development* 53:1111–33, 1982.
- Fields HW, Machen JB, Chambers WL, Pfefferle JC: Measuring selected disruptive behaviour of the 36 to 60 month old dental patient. Part II: Quantification of observed behaviours. *Pediatr Dent* 3:257–61, 1981.
- Sokol DJ, Sokol S, Sokol CK: A review of noninvasive therapies used to deal with anxiety and pain in the dental office. *J Am Dent Assoc* 110:217–22, 1985.
- Melamed BG: Assessment and management strategies for the difficult pediatric dental patient. *Anesth Prog* 33:197–200, 1986.
- Melamed BG, Bennett CG, Jerrell G, Rose SL, Bush JP, Hill C, Courts F, Ronk S: Dentists' behaviour management as it affects compliance and fear in pediatric patients. *JADA* 106:324–30, 1983.
- Fenton SJ, et al. ADH Ad Hoc Committee report: The use of restraints in the delivery of dental care for the handicapped; legal, ethical, and medical considerations. *Spec Care Dentist* 7:253–56, 1987.
- "Guidelines for the Elective Use of Conscious Sedation, Deep Sedation, and General Anaesthesia in Pediatric Patients." *Pediatr Dent* 12:334–37, 1985.
- Hagan PP, Hagan JP, Fields HW Jr, Machen JB: The legal status of informed consent for behaviour management techniques in pediatric dentistry. *Pediatr Dent* 6:204–208, 1984.
- Berry RM: Legal considerations in the administration of conscious sedation, deep sedation and general anaesthesia in dentistry. *Anesth Prog* 33:201–202, 1986.

2.5 GUIDELINES FOR PULP THERAPY FOR PRIMARY AND YOUNG PERMANENT TEETH

The need to restore or extract a primary tooth needs to be carefully considered in the light of a number of factors as described below:

MEDICAL HISTORY

It is important that the child's medical history be taken into account before instituting any form of treatment. Medical conditions of relevance fall into a number of groupings.

CONTRAINDICATIONS

- 1) Congenital cardiac disease. Pulp therapy is contraindicated in children with congenital cardiac disease. While the success rates for pulp therapy are reasonable, the risk and the severe sequelae associated with endocarditis make these therapies inappropriate.
- 2) Immunosuppressed patients
- 3) Children with poor healing potential (eg. uncontrolled diabetes).

INDICATIONS

- 1) Bleeding disorders and coagulopathies. It is desirable to avoid extractions and the requirement for factor replacement in those children with haemophilia, for example, and it may be appropriate to attempt to retain a primary tooth that would otherwise be extracted. However, local anaesthesia may still be required and clinicians should be aware of the implications for this in a child with a coagulopathy.
- 2) Oligodontia where retention of primary teeth is desirable, at least in the interim.

BEHAVIOURAL FACTORS

The ability of a child to tolerate complex restorative dental treatment (under local anaesthesia with or without sedation) is necessary if pulp therapy is to be successful.

The decision as to whether a particular primary tooth is retained or not may be determined by the child's behaviour. There is little doubt that treatment planning is different under general anaesthesia from in the clinic. Under GA teeth with a questionable prognosis may well be extracted. If a child is manageable in the dental chair, then more options are available to the clinician and the failure of pulp therapy is not as significant.

DENTAL FACTORS

CONTRAINDICATIONS

- 1) An unrestorable tooth.
- 2) Tooth near to exfoliation.
- 3) Acute odontogenic infection
- 4) Excessive tooth mobility.

INDICATIONS

- 1) Well-maintained arch.
- 2) Orthodontic considerations. The loss of a second primary molar, before eruption of the first permanent molar, invariably leads to space loss. There is less space loss from the extraction of the first primary molar after the eruption of the second primary molar.
- 3) Lack of a permanent successor.

PULP TREATMENT OPTIONS

Apart from extraction, there are four recognised procedures for pulpal treatment of primary teeth: direct and indirect pulp capping, pulpotomy and pulpectomy.

DIRECT AND INDIRECT PULP CAPPING

A method of maintaining the vitality of the pulp by placing a dressing either directly on to an exposed pulp or onto residual dentine left over a nearly exposed pulp.

A direct pulp cap is the direct placement of a medicament onto the pulp with the intention of promoting a dentine bridge. It is generally not considered successful in carious primary teeth where the pulp is already inflamed.

Indirect pulp capping may be successful in the primary dentition provided that the seal of the coronal restoration is intact. There has been recent interest in reviving this technique given there is good reparative potential of the pulp in primary teeth. However there is only little long term data available on the success of indirect pulp capping procedures and therefore their implementation must be done with caution and the procedure must be completed with a sound restoration.

PULPOTOMY

A pulpotomy is the extirpation of vital pulpal tissue from the coronal chamber followed by medicament placement, over radicular pulp stumps, to fix (mummification, as in the case of formocresol) or stimulate repair (as in the case of calcium hydroxide) of the remaining vital radicular pulp.

Pulpotomy Materials

The following materials are currently in use for this procedure: Formocresol, gluteraldehyde, calcium hydroxide, ferric sulphate, Ledermix™ and iodoform.

In addition, the use of Mineral Trioxide Aggregate (MTA) and Bone Morphogenic Proteins (BMP) and two surgical approaches, electrosurgery and laser ablation (Nd:YAG) are under experimental investigation.

PULPECTOMY/ROOT CANAL THERAPY

Extirpation of pulpal tissue from the coronal pulp chamber and root canals. The canals and the pulp

chamber are then obturated and a coronal restoration is placed which provides a complete seal.

Pulpectomy Materials

The following materials are currently in use for this procedure: zinc oxide eugenol (non reinforced), calcium hydroxide, iodoform paste.

CHOICE OF PULP TREATMENT

The decision as to whether to perform a pulpotomy, a pulpectomy or an extraction, cannot be made without an assessment of the pulpal status.

The status of the pulp may be:

- 1) **Healthy.**
Clinically and radiographically asymptomatic teeth with evidence of dentinal caries.
The tooth requires a routine restoration without recourse to pulp therapy.
- 2) **Reversible pulpitis.**
This is associated with provoked pain that is stimulated by heat, cold, sweets, air or chewing. When the stimulus is removed the pain is reduced or disappears.
A pulpotomy is indicated with an appropriate restoration of the crown to provide a complete coronal seal.
- 3) **Irreversible pulpitis.**
This is associated with unstimulated pain that wakes a child at night and may not be relieved by analgesics. These signs often indicate the beginning of abscess formation. A pulpectomy or extraction is required.
- 4) **Total pulpal necrosis.**
There is usually radiographical evidence as a furcation radiolucency. This is often without pain.
Extraction is the treatment of choice unless other factors preclude this, in which case a pulpectomy followed by a coronal restoration with a complete coronal seal is preferred.
The use of a pulpotomy limited to the coronal pulp chamber (the so-called "non vital pulpotomy") is not indicated for primary teeth with irreversible pulpitis or total pulpal necrosis.

CHOICE OF MEDICAMENTS FOR PULP THERAPY

FORMOCRESOL

This medicament was introduced by Buckley at the turn of the century in the form of 19% formaldehyde and 35% tricresol in a 15% solution of glycerin and water. In current products, the 19% formocresol is diluted 1:5.

The original aim of using formocresol was to completely fix (mummify) the remaining pulpal tissue. Current techniques result in a superficial layer of fixated pulpal tissue overlying a deeper layer of (questionably stable) chronic inflammation in the radicular pulp and healthy tissue in the apical region of the pulp.

There have been extensive studies of the efficacy of this potentially toxic medicament over 50 years, with clinical

success rates ranging from 70% to 100%.

Concerns have been expressed about the systemic spread of formocresol from the tooth site and possible toxic reactions. However, toxicity has only been demonstrated in animal studies where the volumes used far exceeded typical clinical use.

CALCIUM HYDROXIDE

This medicament promotes biological healing and the formation of a hard-tissue barrier over the amputated radicular pulp in primary teeth.

Success rates (60% to 80%) were not greater than those of formocresol. Failure has been attributed to internal resorption. It has been suggested that this is probably due to inaccurate pulpal diagnosis at the outset or a failure to remove the blood clot above the sectioned pulp during the procedure.

FERRIC SULPHATE

The first use of ferric sulphate as a pulp medicament was proposed to aid haemostasis prior to the placement of calcium hydroxide.

A ferric ion complex is formed in contact with blood which promotes haemostasis.

It has been shown to be as effective as Formocresol in clinical studies.

This medicament is significantly less toxic and may offer a good alternative to formocresol in the future. The current protocol does not involve the placement of calcium hydroxide following application of ferric sulphate.

COMMENTS

All pulpally treated primary teeth should be restored in a manner that provides a complete coronal seal. This can be most reliably achieved using a preformed metal crown (for molars) or aesthetic crown (anterior teeth).

It is clearly desirable to move away from the use of potentially toxic compounds and to use medicaments that promote regeneration. However, the long history of success with formocresol ensures that this remains the clinical standard against which all other medicaments are judged.

Where an equally effective and non-toxic medicament is available, it should be used in preference to Formocresol.

2.6 GUIDELINES FOR PAEDIATRIC RESTORATIVE DENTISTRY

INTRODUCTION

By developing this document, the Australasian Academy of Paediatric Dentistry (Inc.) is responding to a public and professional need. In receiving care of a specialised nature, patients deserve treatment that meets the quality of care provided by practitioners in that area of specialisation. The AAPD (Inc.) has the specialty expertise and professional responsibility to assist the dental

profession and the public by setting the standards of oral health care for children, adolescents and individuals with special health care needs. The AAPD (Inc.), representing the practitioners of this specialty, accepts its responsibility by publishing these guidelines.

Restoration of primary teeth is significantly different from restoration of permanent teeth. The mesiodistal diameter of the crown of a primary molar is greater than the cervico-occlusal dimension, the buccal and lingual surfaces converge toward the occlusal, the enamel cap is thinner and is more consistent (about 1mm throughout), the cervicoenamel rods slope occlusally and end abruptly at the cervix instead of being oriented gingivally and gradually becoming thinner as in permanent teeth. The pulp chambers of primary teeth are proportionately larger and the pulp horns are closer to the surface and usually located beneath the cusp tips. Contact areas of primary teeth are broad and flattened rather than a small distinct circular contact point as in permanent teeth.

Young permanent teeth also exhibit characteristics which need to be considered in restorative procedures and may include large pulp chambers and contact areas that are proximal to primary teeth.

The restoration of teeth should include removal of caries or improperly developed tooth structure so as to establish appropriate outline, resistance, retention and convenience form compatible with the restorative material to be utilised.

Restorative treatment shall be based upon the results of an appropriate clinical examination and ideally be part of a documented comprehensive treatment plan. The treatment plan shall take into consideration the developmental status of the tooth, the stage of root development or resorption, the caries experience of the patient, the patient's oral hygiene and the patient's ability to cooperate for treatment. The restorative treatment plan always should be prepared in conjunction with an individually tailored preventive program including appropriate review and maintenance.

Rubber dam isolation should be utilised for the preparation and placement of restorative materials.

PIT AND FISSURE SEALANTS

Sealants are intended to protect caries-susceptible tooth surfaces which are least benefited by fluoride. Sealants can play a significant role in the prevention and control of dental caries in pits and fissures in primary and permanent teeth. Sealants should be placed as soon as possible after the tooth erupts and isolation can be obtained to prevent moisture contamination.

INDICATIONS

Sealants, if indicated by the individual patient's needs, should be placed on non-carious primary or permanent teeth.

OBJECTIVES

The sealant should remain intact and the sealed surface

remain caries-free.

PREVENTIVE RESIN RESTORATIONS

Preventive resin restorations may require minimal tooth preparation of deep pits and/or fissures or the need to remove incipient caries from pits and fissures. The prepared area is filled with a bonded resin and/or glass ionomer cement-based restorative material prior to the application of sealant material to the exposed occlusal pit and fissure areas.

INDICATIONS

Deep pits and fissures in primary and permanent teeth.

OBJECTIVES

The restoration should remain intact and cover all involved and/or susceptible pits and fissures with no evidence of caries beneath or around the margin of the restoration.

RESTORATION OF THE PRIMARY AND PERMANENT DENTITIONS

The aim of the restoration of the primary and permanent dentition is to restore and maintain health, function, form and aesthetics and thereby promote optimal growth and development.

Failure to maintain the primary dentition may result in significant morbidity.

Selection of appropriate materials for restoration of the primary and permanent dentitions should be made to fulfill these requirements and to promote the optimal performance of the material. Such materials include Glass ionomer cements, Compomers, Composite resins, Amalgam, Stainless steel crowns, Porcelain veneers, Fixed and removable prosthetic restorations and Implants.

The Australasian Academy of Paediatric Dentistry (Inc.) is aware of concerns about mercury-containing amalgam but feels at this time there is a lack of substantial scientific evidence to preclude its use in children (NHMRC Australia).

In treatment planning, consideration should be given to the possible placement of implant-borne prostheses at the appropriate age.

REFERENCES

- Smallridge J. UK National Clinical Guidelines in Paediatric Dentistry. *Int J Paediatr Dent* 2000;10:79-83.
- Dental Amalgam and Mercury in Dentistry – Report of an NHMRC Working Party. www.health.gov.au/nhmrc/publications/synopses/d17syn.htm

2.7 GUIDELINES FOR TEMPOROMANDIBULAR JOINT DISORDERS IN CHILDREN AND

ADOLESCENTS

The temporomandibular joints are paired synovial joints between the condyles of the mandible and the squamous part of the temporal bone. Normal balanced development of both temporomandibular joints during childhood is essential for the establishment of normal function and facial symmetry.

Abnormalities and disorders of the temporomandibular joint (TMJ) and its associated musculature, nerve and vascular supply are uncommon in infancy and childhood. Those disorders which do occur, may be either congenital (due to genetic or environmental factors in utero), or may be acquired in the neonatal period, infancy and childhood (due to a number of known and unknown factors and to the anatomical form and delicate, highly vascular and cellular structure of the condyle head in the early stages of its development). In early childhood the TMJs are particularly susceptible to injury and to the localisation of infection from haematologic spread. Congenital or early-acquired abnormalities become more obvious as growth proceeds.

To understand disorders of the temporomandibular joints it is necessary to first understand the development of the joint, which is unlike that of other synovial joints (see Appendix 1, p34).

DISORDERS OF THE TEMPOROMANDIBULAR JOINT

CONGENITAL OCULO-AURICULO VERTEBRAL DISORDER

- hemifacial microsomia (oculo-auriculo vertebral dysplasia)
- Goldenhar syndrome
- Nager de Reynier syndrome
- thalidomide otomandibular dysostosis
- foetal retinoic acid embryopathy
- facio-auriculo vertebral syndrome
- unilateral craniofacial microsomia

These conditions all involve varying degrees of absence or disturbed formation of one or both mandibular condyloid processes, ascending and posterior horizontal rami (including some molar teeth) and other associated structures, zygomatic arches and articular fossae and ears.

MANAGEMENT

Management is by early paediatric dentistry and orthodontic assessment and treatment together with early or later surgical management, to establish facial aesthetics, symmetry and oral function.

ROBIN SEQUENCE

(cleft palate, micrognathia and neonatal respiratory distress)

is a congenital disorder where the TMJ structure is normal, but growth from the condylar growth region has

been restricted due to failure of the head to elevate during the seventh week in utero. A similar postnatal growth retardation occurs in disorders such as oromandibular limb hypogenesis spectrum (Moebius syndrome).

Management

Robin sequence is managed by special intensive care nursing until palate repair can be carried out – occasionally tracheostomy is necessary.

CONGENITAL SUBLUXATION OF THE TMJs

occurs as a result of a difficult vaginal delivery and in Ehlers Danlos syndrome and is related to the extremely flat joint structure and stretching of ligaments and muscles during delivery. It is usually more distressing to the mother than to the child and resolves spontaneously over 4-6 weeks.

NEONATAL SEPTIC ARTHRITIS

of one or both TMJs occurs either by haematologic spread or by direct extension of infection, the resulting septic haemarthrosis leads to bony ankylosis.

CONGENITAL HEMIFACIAL (UNILATERAL) HYPOPLASIA

variably affects the condyle and coronoid process - the body and ramus of the mandible are always abnormal.

HEMIHYPERPLASIA

may involve enlargement of the soft tissues of one side of the whole body or just the face. Bony enlargement of the body, ramus and condyloid process of the mandible also occurs, but there is little enlargement of the actual condyle head and TMJ.

UNILATERAL CONDYLAR HYPERPLASIA

occurs usually during the pre-pubertal growth spurt or at the end of puberty, resulting in a larger condyle head and longer coronoid process on the affected side.

HEMIFACIAL ATROPHY (ROMBERG SYNDROME)

involves the condyloid process and disturbs balanced growth, the extent depending upon the age at onset.

OSTEOCHONDROMA OF THE CONDYLE

is a true benign tumour which results in progressive enlargement of the condyle head and disturbance to balanced mandibular growth.

MANDIBULAR CONDYLOSIS

bilateral osteolysis of the mandibular condyles has been reported following severe measles in early childhood and in juvenile scleroderma. It is also seen in "Massive Osteolysis" and in patients receiving prolonged haemodialysis; the cause is unknown.

MANAGEMENT

Unless otherwise indicated, the above conditions are all managed by early paediatric dentistry, orthodontic assessment and management in conjunction with surgical

reconstruction either early (using condylectomy, costochondral grafting and/ or distraction osteogenesis) or later, once growth has ceased (using bimaxillary osteotomy and /or distraction osteogenesis).

MASSIVE OSTEOLYSIS (“PHANTOM BONE” OR GORHAM’S DISEASE)

is a rare progressive self-limiting resorption of bone and adjacent structures commencing at the site of ligament and muscle attachments – the bone simply disappears and there is no regeneration of lost tissue. In the maxillo-facial region, the first radiographic evidence may be a large radiolucent area extending from the condyle to the body of the mandible. The cause is unknown but there are consistent reports of trauma to the region up to 12 months previously.

Management

There is no satisfactory therapy for this condition due to the amount of tissue loss, but reconstruction is attempted once the disease has arrested.

TRAUMATIC INJURY TO THE MENTAL REGION OF THE MANDIBLE

can result in either subcondylar fracture-subluxation or intra-articular “explosive” condylar surface fracture leading to haemarthrosis with enclosed disc fragments. In the infant under 5 years of age, growth disturbance may occur following subcondylar fracture and in the case of intra-articular fracture TMJ ankylosis is likely to occur, especially if incorrectly managed by immobilisation, which promotes callus and bone formation.

Management

The treatment of choice for subcondylar and intracapsular fractures of the mandible in children is conservative (and non-surgical), with active movement of the mandible after three days (unless there is severe fracture dislocation with loss of bony contact at the fracture site). Ninety percent of children managed optimally will have no growth disturbance.

JUVENILE CHRONIC ARTHRITIS (JCA) INVOLVING THE TEMPOROMANDIBULAR JOINT

Two types of JCA occur:

- Juvenile rheumatoid arthritis (JRA)
- Juvenile psoriatic arthritis (JPsA)

In Australia JRA occurs 1:1,000 children, the presentation, course and prognosis being different from those in the adult disorder. In Australia only 10-20% children with polyarticular JRA have severe TMJ disease with progressive condylar resorption.

Pain in the TMJ is not usually a presenting feature in children. Radiologic evidence of TMJ involvement is present before clinical signs (mandibular displacement to the affected side, increasing depth of the antegonial notch and later micrognathia from disturbance to condylar growth) become apparent. The most frequent radiologic finding is flattening of the superior aspect of the condyle head and articular fossa. Changes are bilateral in 50%

cases and changes in one joint make close clinical and radiologic monitoring of the other joint, mandatory.

In JPsA, the psoriasis may commence either before or after the chronic inflammatory arthritis and as early as one year of age.

As condylar resorption and growth restriction increase, and with continued growth, the antegonial notch of the mandible increases in depth. If not optimally managed, early onset cases (particularly before 5 years of age), result in limitation of movement, micrognathia and progressive anterior open bite. (For further information see Appendix 2, p35)

TEMPOROMANDIBULAR DISORDER (TMD)

is a non-specific term and diagnosis, representing a group of painful and/or dysfunctional conditions involving the TMJ and its associated muscles. TMD occurs predominantly in females, is extremely rare before puberty and is infrequent even in adolescence (when most paediatric cases present). Most cases are self-limiting and resolve with sensitive care and support, without active management. In 90% of cases the presentation is a cycle of multiple area myoskeletal head and neck pain and jaw dysfunction episodes without any identifiable structural cause. Anterior disc placement and joint effusion have been recorded on MRI examination of children with acute TMD.

Diagnosis must involve:

- A detailed history taken initially with parent(s) present, but also with the patient alone. The history must be directed towards family, school and social relationships, eliciting any apparent anxieties or stressful situations.
- A clinical examination which must include a detailed intra-oral examination with dental and panoramic radiographs, the comprehensive palpation of all facial, neck and jaw muscles, measurement and recording of all jaw movements and palpation and auscultation of both TMJs during opening and closing movements.

TMJ sounds not associated with any abnormality are commonly found in children (and in 33% of adults); these are considered variations of normal function.

Just as there is a difference between the frequency of presentation in adults and children, so there is a subtle difference in aetiology and approach to diagnosis. The present ‘science-based standard of care’ for the diagnosis of TMD in children (and in adults), emphasises the “dual diagnostic approach” of physical findings and of behavioural and psychosocial findings.

BIBLIOGRAPHY.

Brooks S.L., Brand J.W., Gibbs J., Hollender L., et al. Imaging the temporomandibular joint. *Oral Surg. Oral Med. Oral Pathology* 83:609-618, 1997.

Chua S.A., Skultety K.J., Suvinen T.I., Clement J.G. Price C. Computerised three-dimensional magnetic resonance

imaging reconstructions of temporomandibular joints for both a model and temporomandibular joint dysfunction. *Oral Surg. Oral Med. Oral Pathology*. 80:604-661, 1995.

Fukumoto M., Oku T., Fukuhara H., Shigeta K., et al. A study of the clinical signs and MRI findings in adolescent patients with Temporomandibular Disorders Japan J. *Paediatric Dentistry* 37: 510-516, 1999.

Goldstein B.H., Temporomandibular disorders . A review of current understanding *Oral Surg, Oral Med, Oral Pathology* 88: 379-385, 1999.

Hall R.K., *Paediatric Orofacial Medicine and Pathology*. Chapman and Hall, London 1994.

Hovinga J., Boering G., Stegenga B. Long-term results of non-surgical management of condylar fractures in children. *Int J Oral Maxillofac Surg* 28::429-440, 1999.

Karhulahi T., Ylijoki H., Ronning O. Mandibular condyle lesions related to age at onset and sub-types of juvenile rheumatoid arthritis in 15-year-old children. *Scand J Dent Res*. 101:332-8, 1993.

Kjellberg H. Juvenile chronic arthritis. Dentofacial morphology, growth, mandibular function and orthodontic treatment. *Swedish Dent J. Suppl.* 109, 1995.

Kjellberg H, Fasth A, Kiliaridis S, Wennerberg B, Thilander B. Craniofacial structure in children with juvenile chronic arthritis (JCA) compared with healthy children with ideal or postnormal occlusion. *Am J Orthod Dentofac Orthop* 107:67-78, 1995.

Larheim T.A., Dale K.A., Tvieta L. Radiographic abnormalities of the temporomandibular joint in children with juvenile rheumatoid arthritis. *Acta Radiologica Diagnosis*. 22:277-284, 1981.

Larheim T.A. Current trends in temporomandibular joint imaging. *Oral Surg, Oral Med, Oral Pathology* 80:555-576, 1995.

McNeill C.(ed.) *Cranio-mandibular Disorders: Guidelines for Evaluation, Diagnosis and Management*. 1st Edition, Quintessence Publishing Company, Chicago, 1990.

Okeson J.P. Screening for temporomandibular disorders and fabrication of a chairside occlusal appliance. *Clinical Topics in Dentistry*, 1993.

Okeson J.(ed) *Management of Temporomandibular Disorders and Occlusion*, 3rd Edition, Mosby Year Book, St Louis. 1993.

Pederson T.K. Clinical aspects of orthodontic treatment for children with juvenile chronic arthritis. *Acta Odontol Scand* 56:367-68. 1998.

APPENDIX I

DEVELOPMENT OF THE TEMPOROMANDIBULAR JOINT.

The TMJ develops from temporal and condylar blastema that are initially separated and then grow together. The otic capsule of the basicranium gives rise to the temporal blastema and the secondary condylar cartilage gives rise

to the condylar blastema. The accessory mandibular condylar cartilage grows toward the temporal blastema in the intervening fibrous tissue forming the two separate joint cavities and disc (the lower joint cavity forms first at 10 weeks in utero followed by the upper at 12 weeks in utero)

The disc is initially thin and thickens progressively with formation of the articular eminence. The posterior articular surface of the joint is the ultrathin tympanic plate which includes the petrotympanic fissure. The lateral pterygoid muscle attaches into the condyle head medio-anteriorly and into the disc and capsule.

The articular fossa and condyle head are covered by a very thin fibrous perichondrium; the underlying secondary cartilage of the condyle, which is a major growth region, consists of rows of plump chondrocytes with high osteogenic potential which change to a soft vascular bone with a very thin cortical layer. From 5 years of age, the perichondrium of articular surface of both condyle head and fossa becomes progressively more fibrous and the cortical bone thicker and more dense.

At birth the condyloid process is very short and the TMJ capsule lax (which allows necessary displacement during birth); the articular fossa is flat, and there is no significant articular tubercle until 7 years of age, after which it increases rapidly in size until full development is reached at 12 years of age. Both joints continue to grow laterally with the neurocranium into adult life.

The mandibular body and rami form at 6 weeks in utero from membrane bone lateral to Meckel's cartilage and by 8 weeks in utero the lateral pterygoid muscles act on the mandible to produce movement.

APPENDIX 2

ADDITIONAL NOTES ON THE DIAGNOSIS AND MANAGEMENT OF JUVENILE CHRONIC ARTHRITIS.

The diagnosis of TMJ involvement in JCA by radiological examination, (as with all TMJ conditions), should follow a detailed history and clinical examination. In children, the initial panoramic and transcranial plain films of the TMJs may be followed by CT or MRI (with 3D reconstruction) or radionuclide imaging, if a more detailed study is required.

Modern evidence-based medical management of JCA involves an holistic approach, which includes the administration of non-steroid anti-inflammatory agents, the use of intra-articular steroids (where beneficial), sulphasalazine, methotrexate cytotoxic therapy and gammaglobulin. Particular attention is paid to the patient and family as a unit. Skilled physiotherapy and occupational therapy, with exercise programmes and attention to diet are essential components of this approach.

The TMJ pathology rarely requires steroid injection in childhood. Later orthodontic and/or surgical management using osteotomy and distraction-osteogenesis techniques will be required depending upon the severity of the damage to the joint and the resultant degree of deformity

of both mandible and maxilla.

The prognosis of JCA is favourable in the majority of cases where appropriate medical, surgical and physiotherapies are in place, in a child who has been correctly diagnosed early.

APPENDIX 3

ADDITIONAL NOTES ON THE DIAGNOSIS AND MANAGEMENT OF TEMPOROMANDIBULAR DISORDER

In children with TMD, while dental study models may be useful, occlusal analysis is not applicable, nor are techniques such as electromyography, ultrasound, thermography or mandibular kinesiography. Malocclusion is not an important factor in TMD and no irreversible occlusal alteration by either orthodontic or restorative dentistry should be undertaken. Occasionally TMD has been reported following orthodontic treatment in children who have been previously free of TMJ signs or symptoms. In all but a few reported cases there is no relation between previous TMJ trauma or orthodontic treatment in childhood or adolescence, and later TMD.

Management

The management of TMD in children and adolescents aims to undertake only reversible therapy that aids normal musculoskeletal healing with improvement of symptoms, and is based on individual patient needs. Most TMD patients improve without intervention. Many current clinical practices are still controversial and are not evidence-based. Treatment is only indicated when pain and/or dysfunction require management.

Standard of Care

The current “standard of care” for non-structural TMD is management with cognitive therapy and muscle relaxation techniques. As most cases of TMD are not oral or tooth related the role of the paediatric dentist is one of diagnosis followed by support and education. An inter-occlusal splint is the most common dental treatment and is felt to be helpful by many patients. Such a splint should be considered as a “healing aid” rather than a definitive treatment. TMJ surgery is virtually never indicated for TMD in children and adolescents. Combinations of physical therapies may assist healing, but relaxation and emotional stress relief techniques are most effective.

Predictors of poor outcome

Predictors of poor outcome are depression, anxiety and low self-esteem; where these factors are present, referral to a paediatrician and psychologist is essential. A few children are helped by referral to an adolescent psychiatrist.

2.8 GUIDELINES FOR PRESCRIBING DENTAL RADIOGRAPHS

Radiation hygiene must be maintained in accordance with regional regulations. The guidelines serve as recommendations that dentists can use to determine when they should take a radiograph. They will help determine the type of radiograph needed, how frequently and under what conditions radiographs should be taken. Under these guidelines, a dentist will take a radiograph based on clinical observation and the patient's health history.

The guidelines are based on patient selection criteria, which are descriptions of clinical conditions derived from patient signs, symptoms and history that identify patients who are likely to benefit from a particular radiographic examination. The guidelines are illustrated in a chart designed to serve as a handy daily reference and are offered as a supplement to the expertise of the clinician.

The recommendations in this chart (next page) are subject to clinical judgement and may not apply to every patient. They are to be used by dentists only after reviewing the patient's health history and completing a clinical examination. The recommendations do not need to be altered because of pregnancy.

(SEE TABLE, NEXT PAGE)

2.9 ANTIBIOTIC CHEMOPROPHYLAXIS FOR PAEDIATRIC DENTAL PATIENTS AT RISK

Endocarditis is an uncommon yet important life-threatening disease. There is a need to provide approved antibiotic prophylaxis for potential at-risk patients receiving dental treatment as there is strong circumstantial evidence that endocarditis may follow dental treatment in susceptible patients. Further, infective endocarditis has a high mortality rate (10-15%).

There are problems associated with prophylaxis regimens in that no two sets of antibiotic guidelines are the same. Less than 10% of patients with endocarditis have had a recent invasive dental procedure and there is no direct evidence in humans that antibiotic prophylaxis is effective. Indeed, there have been many cases of endocarditis occurring in spite of 'appropriate' cover having been given. Currently, there is disagreement over the efficacy of different protocols, which patients should be covered and further, which dental procedures should be covered.

There are four accepted protocols in use in Australasia:

- 1) American Heart Association adopted by the American Dental Association (Revised 1997)
- 2) British Society for Antimicrobial Chemotherapy (Revised 1992)
- 3) Victorian Drug Usage Advisory Committee, adopted by the Australian Dental Association (2000)

- 4) New Zealand National Heart Foundation adopted by the New Zealand Dental Association (1999)

GUIDELINES FOR CLINICIANS

HISTORY

It is essential that the patient's medical history be assessed with respect to a cardiac problem. The local physician or cardiologist involved in the patient's care must always be consulted and advice be sought as to the details of the complaint and whether antibiotic prophylaxis will be required. If this information is not available, then a formal cardiac review should be sought.

OTHER CONSIDERATIONS

- Is the patient on long-term antibiotics?
Alternative drugs should be used.
- Does the patient have a convincing history of allergy to antibiotics?
Anaphylaxis must always be considered when penicillin is used.
- Does the patient have impaired renal function which will necessitate dose modification?
- Is there a history of vomiting with oral antibiotics?
If so consider parenteral medication.
- Is a general anaesthetic required?
The use of IV antibiotics, for children undergoing general anaesthesia, has several advantages over oral and IM techniques. Blood levels are rapidly achieved, prophylaxis is more predictable and there are no problems with compliance. Serious consideration should be given to arranging general anaesthesia and IV antibiotics for children who require multiple visits.
- In addition to antibiotic cover, it is considered routine in most paediatric dental departments to use a preoperative rinse of 0.2% chlorhexidine gluconate to reduce the risk of bacteraemia.

CLASSIFICATION OF PATIENTS

HIGHLY SUSCEPTIBLE PATIENTS

- Prosthetic cardiac valves.
- Previous bacterial endocarditis.

- Recent surgical repair of cardiovascular defect within 6 months.
- Complex cyanotic congenital heart disease
Single ventricle states
Transposition of great vessels
Tetralogy of Fallot
- Surgically constructed systemic pulmonary shunts or conduits.

SUSCEPTIBLE PATIENTS

- Renal dialysis with atrioventricular (AV) shunt appliance.
- Ventriculo-atrial or ventriculo-venous shunts for hydrocephalus.
- Hypertrophic cardiomyopathy.
- Indwelling vascular catheter.
- Most congenital cardiac malformations
Ventricular septal defect (VSD) (unrepaired).
Patent ductus arteriosus.
Coarctation of the aorta.
Tricuspid valve disease.
Asymmetric septal hypertrophy.
Tetralogy of Fallot.
Aortic stenosis.
Complex cyanotic heart disease.
Bicuspid aortic valve.
Idiopathic hypertrophic-subaortic stenosis (IHSS).
Mitral valve prolapse (MVP) with mitral insufficiency and/or holosystolic murmur.

PATIENTS WITH CONDITIONS NOT REQUIRING PROPHYLAXIS

- History of rheumatic fever (>5 years) without clinical heart disease.
- Uncomplicated secundum atrial septal defect.
- Surgical repaired secundum atrial septal defect (ASD), ventricular septal defect (VSD), or Patent ductus arteriosus beyond 6 months and without residua.
- Previous coronary artery bypass graft.
- Mitral valve prolapse without valvular regurgitation.
- Previous Kawasaki's disease without valvular dysfunction.
- Cardiac pacemakers and implanted defibrillators.
- Well-controlled diabetics.
- Atherosclerotic heart disease.
- Ventriculoperitoneal (VP) shunts for hydrocephalus.
- Physiological, functional or innocent murmurs.

There is great disagreement over the need to cover VP shunts. While theoretically there is no risk of a bacteraemia colonizing a shunt, which has no direct communication with the bloodstream, some neurosurgeons insist that their patients be covered. Dentists should be advised to consult with the particular protocol of the neurosurgeon who is responsible for the patient.

CLASSIFICATION OF PROCEDURES

PROCEDURES THAT REQUIRE PROPHYLAXIS

All dental procedures likely to induce bleeding from gingival mucosa or bone including

- Dental extractions
- Endodontic procedures beyond the apex
- Periodontal procedures including probing, scaling, root planing and surgery
- Replantation of avulsed teeth
- Placement of orthodontic bands (but not brackets)
- Intra-alveolar local anaesthetic injections
- Endotracheal intubation

PROCEDURES THAT DO NOT REQUIRE PROPHYLAXIS

- Dental examination excluding periodontal probing
- Placement/removal and adjustment of orthodontic or prosthetic appliances
- Restorations above the gingival margin
- Endodontic procedures confined to the root canal after pulp extirpation
- Injection of local intra-oral anaesthetic (except intra-alveolar)
- Exfoliation of primary teeth
- Rubber dam placement
- Taking or intra-oral radiographs
- Brushing and flossing
- Taking of impressions

RELATIVE RISK OF PROCEDURES

It is considered that some procedures subject the patient to a higher level of risk of developing endocarditis than others. An open surgical procedure will produce a significantly greater bacteraemia than gingival scaling or placing a matrix band below the gingival margin.

If the procedure is determined to put a potentially susceptible patient at higher risk the use of parenteral antibiotics should be considered.

RECOMMENDATIONS FOR USE OF PROTOCOLS FOR ANTIBIOTIC PROPHYLAXIS

The Australasian Academy of Paediatric Dentistry (Inc.) does not make a recommendation as to the efficacy of one particular protocol over another. It is accepted that the four widely used protocols have each been formulated with due regard to the current literature and clinical practice. The use of specific protocols will also differ from one institution to another and in different countries and therefore the Academy recommends that any of the above protocols may be used. It is the responsibility of clinicians to determine which protocol is the most suitable to their individual patient.

REFERENCES

Dajani AS, Taubert KA, Wilson W et al. Prevention of bacterial endocarditis. Recommendations of the American Heart Association. J Am Dent Assoc 1997;

GUIDELINES FOR PRESCRIBING DENTAL RADIOGRAPHS

PATIENT CATEGORY	CHILD	ADOLESCENT	ADULT
	Primary Dentition (prior to eruption of first permanent tooth)	Transitional Dentition (following eruption of first permanent tooth)	Permanent Dentition (prior to eruption of third molars)
		Dentulous	Edentulous
New patient* All new patients to assess dental diseases and growth and development	Posterior bite-wing examination if proximal surfaces of primary teeth cannot be visualised or probed	Individualised radiographic examination consisting of periapical/anterior occlusal views† and posterior bite-wings or panoramic examination and posterior bite-wings††	Individualised radiographic examination consisting of posterior bite-wings and selected periapicals. A full mouth intraoral radiographic examination is appropriate when the patient presents with clinical evidence of generalised dental disease or a history of extensive dental treatment
Recall patient* Clinical caries or high-risk factors for caries**	Posterior bite-wing examination at 6-month intervals or until no carious lesions are evident	Posterior bite-wing examination at 6- to 12-month intervals or until no carious lesions are evident	Posterior bite-wing examination at 12- to 18-month intervals
No clinical caries and no high-risk factors for caries**	Posterior bite-wing examination at 12- to 24-month intervals if proximal surfaces of primary teeth cannot be visualised or probed	Posterior bite-wing examination at 18- to 36-month intervals	Posterior bite-wing examination at 24- to 36-month intervals
Periodontal disease or a history of periodontal treatment	Individualised radiographic examination consisting of selected periapical and/or bite-wing radiographs for areas where periodontal disease (other than non-specific gingivitis) can be demonstrated clinically	Individualised radiographic examination consisting of selected periapical and/or bite-wing radiographs for areas where periodontal disease (other than non-specific gingivitis) can be demonstrated clinically	Not applicable
Growth and development	Usually not indicated	Periapical or panoramic examination to assess developing third molars	Usually not indicated

*Clinical situations for which radiographs may be indicated include

- A. Positive Historical Findings
 1. Previous periodontal or endodontic therapy
 2. History of pain or trauma
 3. Familial history of dental anomalies
 4. Postoperative evaluation of healing
 5. Presence of implants
 - B. Positive Clinical Signs/Symptoms
 1. Clinical evidence of periodontal disease
 2. Large or deep restorations
 3. Deep carious lesions
 4. Malposed or clinically impacted teeth
 5. Swelling
 6. Evidence of facial trauma
 7. Mobility of teeth
 8. Fistula or sinus tract infection
 9. Clinically suspected sinus pathology
 10. Growth abnormalities
 11. Oral involvement in known or suspected systemic disease
 12. Positive neurologic findings in the head and neck
 13. Evidence of foreign objects
 14. Pain and/or dysfunction of the temporomandibular joint
 15. Facial asymmetry
 16. Abutment teeth for fixed or removable partial prosthesis
 17. Unexplained bleeding
 18. Unexplained sensitivity of teeth
 19. Unusual eruption, spacing or migration of teeth
 20. Unusual tooth morphology, calcification or colour†
 21. Missing teeth with unknown reason
- **Patients at high risk for caries may demonstrate any of the following:
1. High level of caries experience
 2. History of recurrent caries
 3. Existing restoration of poor quality
 4. Poor oral hygiene
 5. Inadequate fluoride exposure
 6. Prolonged nursing bottle or breast
 7. Diet with high sucrose frequency
 8. Poor family dental health
 9. Developmental enamel defects
 10. Developmental disability
 11. Xerostomia
 12. Genetic abnormality of teeth
 13. Many multisurface restorations
 14. Chemo/radiation therapy

† Anterior occlusal films are preferable to periapical films as they provide a wider field for the same amount of radiation employed

†† Large bite-wing films (size 2) should be used whenever possible, especially when the first permanent molars are erupted

128: 1142-51.

Working Party for the British Society of Antimicrobial Chemotherapy. Antibiotic prophylaxis for infective endocarditis. *Lancet* 1992; 339: 1292-93.

Therapeutic Guidelines: Antibiotic. Version 11th 2000. Therapeutic Guidelines Ltd, North Melbourne, Victoria 3051. Australia. 2000.

Ellis-Pegler RB, Hay KD, Land SD, Neutze JM, Swinburn BA. Prevention of infective endocarditis associated with dental treatment and other medical interventions. *National Heart Foundation. NZ Dent J* 1999 95:85-8.

Littler WA, McGowan DA, Shanson DC. Changes in recommendations about amoxycillin prophylaxis for prevention of endocarditis. *British Society for Antimicrobial Chemotherapy Endocarditis Working Party. Lancet.* 1997 Oct 11;350(9084):1100.

Littler WA, McGowan DA, Conlon C, Shanson DC, Eykyn S, Swanton H. Amoxycillin prophylaxis for endocarditis prevention. *British Society for Antimicrobial Chemotherapy Endocarditis Working Party. Br Dent J* 1998 184(5):208

2.10 MANAGEMENT OF PAEDIATRIC DENTAL PATIENTS RECEIVING CHEMOTHERAPY AND/OR RADIATION

The paediatric dental patient who is currently or has previously received chemotherapy and/or radiotherapy requires special consideration and altered dental management depending on the child's diagnosis and oral health status at the time of the therapy.

Although some children receive radiation for specific head and neck tumours, most childhood cancers are treated with chemotherapy alone. Children with brain tumours, bone marrow transplantation and CNS prophylaxis receive fractionated doses of radiation in conjunction with chemotherapy and require additional consideration.

The following sequelae and oral complications may occur during or following therapy.

CHEMOTHERAPY

Acute complications

- 1) Stomatitis / Mucositis
- 2) Gingival haemorrhage / Mucosal petechiae / Ecchymoses
- 3) Opportunistic infection

Long term sequelae

- 1) Agenesis of teeth
- 2) Microdontia
- 3) Thinning of roots
- 4) Enamel hypoplasia or hypomineralisation
- 5) Oro-facial growth disturbance

RADIOTHERAPY

Recent improvements in radiotherapy technique may

reduce the severity of the conditions listed below.

Acute complications

- 1) Stomatitis / Mucosal keratinisation
- 2) Salivary gland dysfunction / Xerostomia
- 3) Muscle trismus
- 4) Opportunistic infection
- 5) Dysphagia
- 6) Altered taste sensation

Long term sequelae

- 1) Osteoradionecrosis
- 2) Muscle fibrosis
- 3) Dental caries
- 4) Rapidly progressive periodontal disease
- 5) Dental developmental disturbances
- 6) Oro-facial growth disturbances

BONE MARROW TRANSPLANTATION

Acute complications

- 1) As in Chemotherapy and Radiotherapy above
- 2) Acute Graft versus Host disease

Long term sequelae

- 1) As in Chemotherapy and Radiotherapy above
- 2) Chronic Graft versus Host disease

DENTAL MANAGEMENT

Dental management must be coordinated with the medical investigations and treatment. It can be divided in three phases (initial bedside screening, immediate dental care, follow-up dental care).

INITIAL ADMISSION, DIAGNOSIS AND SCREENING

Education and Preventive guidelines

- 1) Baseline dental and periodontal examination, radiographs
- 2) Head and neck exam
- 3) Soft tissue exam
- 4) Oral health education and mouth care counselling
- 5) Coordination of dental treatment with oncologist

Treatment objectives

- 1) Decrease the morbidity and mortality due to oral infection
- 2) Decrease the morbidity due to haemorrhage
- 3) Improve the child's comfort and minimise the complications associated with therapy
- 4) Educate the parent and family regarding the ongoing oral needs of the child
- 5) Prevent dental caries secondary to radiotherapy

IMMEDIATE DENTAL CARE

Treatment guidelines

- 1) Extraction of pulpally involved teeth
- 2) Careful consideration of extraction of exfoliating primary teeth
- 3) Restore or dress all other carious teeth
- 4) Removal of orthodontic appliances and potential irritants
- 5) Dental prophylaxis and periodontal treatment
- 6) Institute optimal oral hygiene, antiseptic mouthwash program (e.g 0.2% chlorhexidine) and topical

fluoride therapy during chemotherapy

- 7) Manage oral complications with appropriate antimicrobial therapy in consultation with oncologist
- 8) Monitor oral health during the cycles of chemotherapy and immunosuppression.

FOLLOW-UP DENTAL CARE

Treatment guidelines

- 1) Monitor dental and orofacial development
- 2) Continue optimal oral hygiene, topical and systemic fluoride therapy and dietary advice
- 3) Physiotherapy for muscle trismus
- 4) Place the patient on a 3-6 month recall schedule depending on caries risk assessment
- 5) Restorative and periodontal therapy to optimise oral health.

HAEMATOLOGICAL GUIDELINES

Specific haematological guidelines should be established between the oncology and the paediatric dental units, however, the following values should serve as a guide.

BASELINE BLOOD COUNTS

(thrombocytopenia) or dysfunctional platelets

Normal platelet count – 150,000 / mm³ to 400,000 / mm³

DISEASES OF THE WHITE BLOOD CELLS

Leucopenia: is a decrease in the absolute number of white blood cells, which may be divided into disorders causing decreased neutrophils (neutropenia) or decreased lymphocytes (lymphopenia) or both.

Neutropenia: is not a disease but a sign of an underlying disorder affecting the bone marrow or peripheral blood.

PLATELET DISORDERS

Disorders of platelets include increased platelets (thrombocytosis), decreased platelets

Patients with severe neutropenia are highly susceptible to overwhelming bacterial infection, making dental treatment accompanied by bacteraemia a risky procedure

TEST	NORMAL	
	MALE	FEMALE
Haemoglobin (g/dl)	13.5 – 17.5	12 - 15
Haematocrit (%)	40 – 52	36 – 48
Red blood cell count (x 10⁶)	4.5 – 6.5	4 – 5.5

Thrombocytosis: is a rare disorder which may be caused by polycythaemia, neoplasms, infection, a physiological response to exercise, pregnancy, or adrenaline release.

Thrombocytopenia: is defined as a platelet count < 140,000 / mm³. Patients with platelet counts <75,000 / mm³ may exhibit post-surgical haemorrhage while counts <25,000 / mm³ cause spontaneous haemorrhage, easy bruising and petechiae and ecchymosis of the skin / mucosa.

Diseases of the leucocytes are among the most important disorders for dentists to understand since early oral signs and symptoms are prominent in this disease and dental treatment is complicated by the increase risk of infection.

DIFFERENT WHITE BLOOD CELL COUNT NORMAL VALUES

Cell Type	Absolute Number per mm ³	Percent
Band	0 – 2,000	0 - 10
Neutrophil	3,000 – 6,000	30 - 75
Lymphocyte	1,500 – 4,000	20 - 50
Monocyte	200 – 900	1 – 12
Eosinophil	100 - 700	0 – 3
Basophil	20 - 150	0 - 1
Total WBC (leucocyte) count: 4,000 to 11,000 cells/mm ³		

2.11 PERIODONTAL DISEASES OF CHILDREN AND ADOLESCENTS

INTRODUCTION

The Australasian Academy of Paediatric Dentistry (Inc.) accepts the classification of periodontal disease arising from the consensus of the 1999 International Workshop for a Classification of Periodontal Disease, which was staged by the

Neutropaenia	
Mild	1,000 / mm ³ – 2,000 / mm ³
Moderate	500 / mm ³ – 1,000 / mm ³
Severe	< 500 / mm ³

American Academy of Periodontology. The consensus of classification is illustrated in Fig. 1

(See page 42).¹

The main changes are in the wording describing the various disease classifications to reflect the better current

understanding of disease presentations and differences. There was also acknowledgment that early onset and adult forms of periodontal disease can occur at any age.

Five main categories of periodontal disease are now recognised as follows:^{1,2}

GINGIVITIS

Chronic gingivitis is common in children and is characterised by the presence of gingival inflammation without detectable loss of bone or clinical attachment. Categories include puberty-related gingivitis, gingival overgrowth and pregnancy gingivitis. Gingivitis usually responds to a thorough removal of bacterial deposits and improved daily oral hygiene practices.

CHRONIC PERIODONTITIS

Chronic Periodontitis, previously described as adult periodontitis, is now recognised in children and adolescents, as well as adults. It is a slowly progressing form of periodontitis and is the most commonly occurring form of periodontitis. Chronic periodontitis is designated as “localised” or “generalised” depending on whether less than or greater than 30% of sites within a mouth are affected.

AGGRESSIVE PERIODONTITIS

Aggressive periodontitis was previously described as early onset periodontitis in both its localised and generalised forms. It was accepted that “aggressive periodontitis”, in either “localised” or “generalised” variants, can persist into older adulthood. The term “incidental attachment loss” is now used to describe a localised periodontitis that does not fit into either “chronic” or “aggressive” categories.

The microbiology of aggressive periodontitis is complex, and the aetiology is incompletely understood. Numerous studies have shown an association of a variety of micro-organisms including *Actinobacillus actinomycetemcomitans* and *Porphyromonas gingivalis* with aggressive periodontitis. Generalised aggressive periodontitis has a wide spread distribution and may involve the entire periodontium with a rapid rate of destruction. Patients with localised aggressive periodontitis generally form very little supragingival dental plaque or calculus. Localised aggressive periodontitis, affecting mainly the first molars and incisors, and generalised aggressive periodontitis, usually affecting most

of the dentition, are distinguishable both radiologically and clinically. A number of studies have shown that localised aggressive periodontitis subjects have high titres to *A. actinomycetemcomitans*, whereas generalised aggressive periodontitis subjects have high titres to *P. gingivalis*.³

NECROTIZING ULCERATIVE PERIODONTAL DISEASES

It was accepted that the terms “necrotizing ulcerative gingivitis” and “necrotizing ulcerative periodontitis” be described as “necrotizing ulcerative periodontal diseases”, as they were likely to be different stages of the same infection rather than separate diseases. It was noted that necrotizing ulcerative gingivitis is limited to the gingivae, whereas necrotizing ulcerative periodontitis also involves the periodontal attachment.

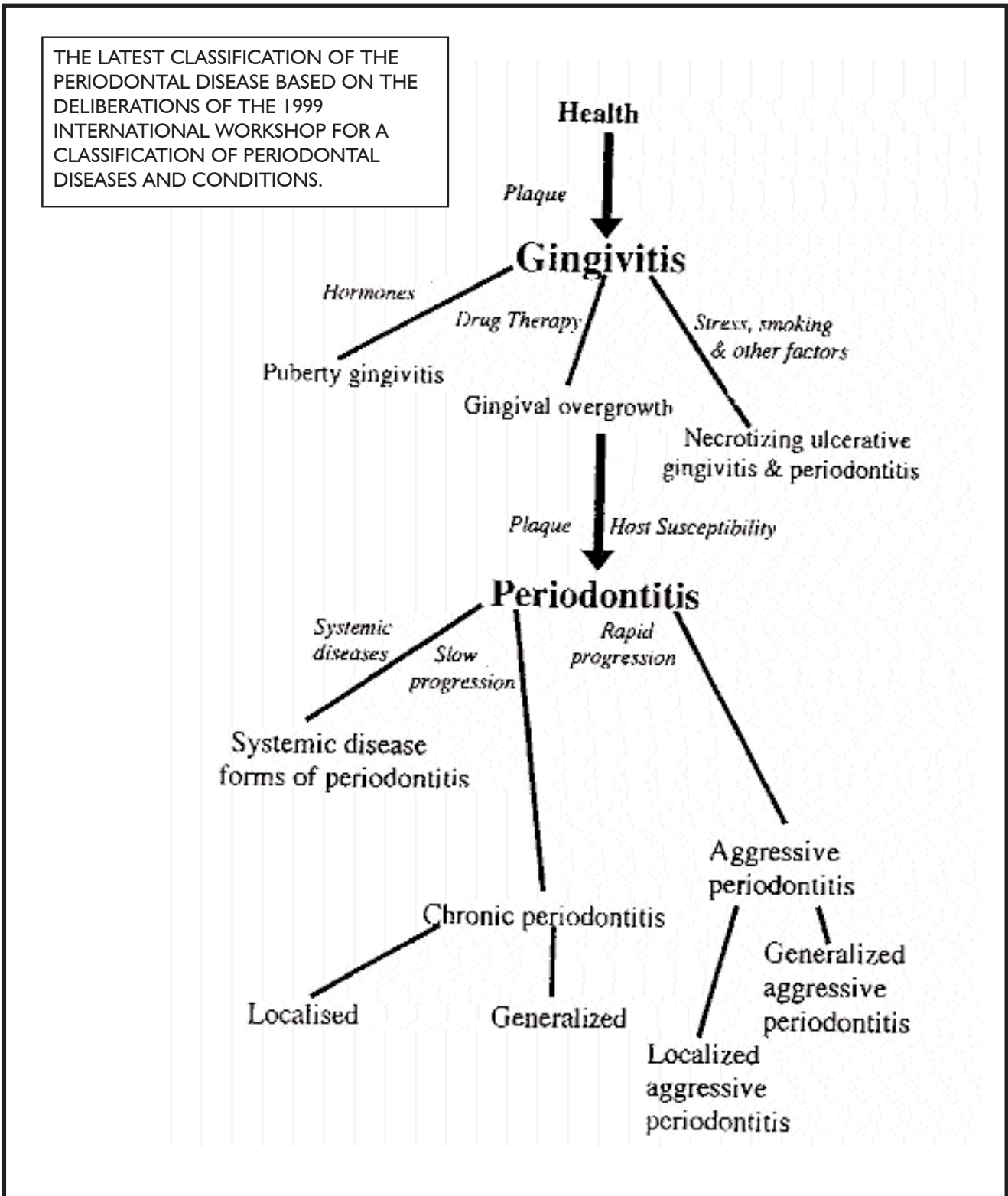
Necrotizing ulcerative periodontal disease occurs with varying but low frequency in North American and European children, however it is seen with greater frequency in certain populations of children and adolescents from underdeveloped areas of Africa, Asia and South America. The two most significant findings used in the diagnosis of necrotizing ulcerative periodontal diseases are the presence of interproximal necrosis and ulceration and the rapid onset of gingival pain. There is often halitosis and an elevated systemic temperature. Affected sites harbour high levels of spirochaetes and *P. intermedia*. Factors that predispose children to necrotizing ulcerative gingivitis include smoking, malnutrition, emotional stress, lack of sleep, and immunosuppression.

SYSTEMIC DISEASES FORMS OF PERIODONTITIS

This category includes systemic conditions that modify periodontitis, as well as certain systemic conditions that cause periodontitis in conjunction with microbiological plaque.

As with adults, periodontitis associated with systemic disease occurs in children and adolescents. Such diseases include Papillon Lefevre syndrome, cyclic neutropaenia, agranulocytosis, Down syndrome, Insulin dependent

FIGURE 1



diabetes mellitus, leucocyte deficiency, and human immune virus (HIV). It is probable that defects in neutrophil and immune cell function associated with these diseases play an important role in increased susceptibility to periodontitis and other infections.

SUMMARY

Children and adolescents are subjected to a wide variety of periodontal infections. Although there is a much lower prevalence of destructive periodontal disease in children than in adults, children can develop severe forms of periodontitis. Often the diagnosis is more difficult due to the uncommon occurrence of periodontitis in children. Since early diagnosis is important for successful treatment it is imperative that children receive a periodontal examination as part of their routine dental visits. Furthermore, destructive periodontal disease often occurs in adolescents with certain systemic diseases. The presence of severe periodontitis in children and adolescents may be an early sign of systemic disease. A medical evaluation to determine if systemic diseases are present should be considered in children who exhibit severe periodontitis, especially if the disease is resistant to therapy.

REFERENCES

- 1) 1999 Workshop for a Classification of Periodontal Diseases and Conditions. *Ann Periodontol* 4: 1-112, 1999.
- 2) Kinane, DF. Periodontal disease in children and adolescents; introduction and classification. *Periodontol* 2000 26: 7-15, 2001.
- 3) Darby I, Curtis M. Microbiology of periodontal disease in children and young adults. *Periodontol* 2000 26: 33-53, 2001.

2.12 GUIDELINES FOR PERIODONTAL THERAPY IN CHILDREN AND ADOLESCENTS

INTRODUCTION

The Australasian Academy of Paediatric Dentistry (Inc.) offers the following Guidelines for Periodontal Therapy.

Research has provided irrefutable evidence that chronic inflammatory periodontal diseases are treatable. As a result, the great majority of children will retain their dentition over their lifetime with thorough treatment, reasonable plaque control, and continuing maintenance care. There are some situations when traditional therapy is not effective in arresting the disease. In these instances the progression of the disease may be slowed, but eventually the teeth may be lost.

GOALS OF PERIODONTICS

The goals of periodontal therapy are to preserve the natural dentition; to maintain and improve periodontal

health, comfort, aesthetics, and function; and to provide replacement roots (i.e., dental implants) where indicated. The currently accepted clinical signs of a healthy periodontium include the absence of inflammatory signs such as redness, swelling, exudate and bleeding upon gentle probing; and the maintenance of a functional periodontal attachment over a period of time.

DIAGNOSIS AND TREATMENT OF PERIODONTAL DISEASES

All children should receive a thorough, systematic periodontal examination. This should include the chief complaint, medical and dental histories, clinical examination and analysis of appropriate radiographs. Microbiological or other tests may be also useful, on an individual basis. Children undergoing dental examination should have periodontal probing of 6-year-old molars, and of permanent central and lateral incisor teeth. Children at risk of infective endocarditis will need periodontal probing and scaling performed under appropriate antibiotic cover.

Dental examination of children should note the presence and severity of gingival inflammation, periodontal pocket depth and attachment level, presence and distribution of plaque and calculus, tooth proximal contact relationships, tooth mobility, malocclusion, habits and the presence of mouth breathing.

Periodontal care will be managed as an integral part of an overall treatment plan. Follow-up of periodontal status and reassessment of past care is essential due to the potentially ongoing nature of periodontal disease. Both patients and parents must be informed of diagnosis, prognosis and treatment options.

Routine periodontal care typically will include patient education and training in personal oral hygiene, and removal of supragingival and subgingival bacterial plaque and calculus deposits. Less commonly needed procedures may include use of chemotherapeutic agents to reduce microbial pathogens or modify the host response. Antimicrobial or anti-inflammatory agents may be delivered systemically or topically. Surgical procedures maybe undertaken to reduce periodontal pockets or to change periodontal architecture. These will include gingivectomy, osteoplasty, mucogingival flap procedures, root resection and guided tissue regeneration. Occlusal therapy and minor tooth movement may be undertaken to optimise periodontal health. Dental implants to replace missing teeth may be undertaken, generally after facial growth has been completed.

TREATMENT OUTCOMES

The outcome of periodontal treatment may be compromised by patient inability to maintain adequate plaque control. Adverse health habits such as smoking, systemic diseases or adverse iatrogenic or anatomic factors may also compromise periodontal treatment.

