

Contents

Preface to the second edition	xiii		
Contributors	xiv		
1 Pediatric oral health care: the perspectives	1		
<i>Sven Poulsen and Göran Koch</i>			
How it began: the historical perspective	1		
Community responsibility: the population perspective	1		
From birth to adolescence: the oral health perspective	1		
UN Convention on the Rights of the Child: the ethical perspective	2		
Pediatric dentistry: the clinical perspective	3		
References	4		
2 Growth and pubertal development	5		
<i>Anders Juul, Sven Kreiborg and Katharina M. Main</i>			
Measurement of growth in different phases of life	5		
<i>Prenatal growth</i>	5		
<i>Postnatal growth</i>	5		
<i>Infancy</i>	6		
<i>Childhood</i>	7		
<i>Puberty</i>	7		
Growing pains	8		
Evaluation of growth charts	8		
Bone age determination	10		
Final height prediction	10		
Dental age determination	10		
Disorders of growth and puberty	11		
<i>Intrauterine growth restriction</i>	11		
<i>Postnatal growth failure</i>	11		
<i>Tall stature and growth acceleration</i>	13		
<i>Early puberty</i>	15		
<i>Late puberty</i>	15		
<i>Disorders with deviations in dental maturity</i>	15		
Conclusion	15		
References	16		
3 Child and adolescent psychological development	17		
<i>Anders G. Broberg and Gunilla Klingberg</i>			
Perspectives on psychological development	17		
<i>A biopsychosocial approach</i>	17		
Aspects of psychological development	18		
<i>Cognitive development</i>	18		
<i>Emotional development</i>	21		
<i>Developmental tasks</i>	23		
Man is a social animal	24		
<i>Attachment theory</i>	24		
<i>Social ecology</i>	25		
A holistic description of children of different ages	25		
<i>The preschool years (3–5 years)</i>	25		
<i>The elementary school years (6–12 years)</i>	26		
<i>Adolescence (13–18 years)</i>	27		
Developmental psychopathology	28		
<i>The biopsychosocial model</i>	29		
<i>Resilience and protective factors</i>	29		
<i>Developmental lines</i>	29		
Summary	30		
References	30		
4 Dental fear and behavior management problems	32		
<i>Gunilla Klingberg, Magne Raadal and Kristina Arnrup</i>			
Definitions and prevalence of dental fear and anxiety	32		
Etiology	33		
<i>Personal factors</i>	34		
<i>External factors</i>	35		
<i>Dental factors</i>	36		
Principles of management	37		
<i>Creating a safe environment for the child</i>	37		
<i>Behavior shaping</i>	38		
<i>Desensitization</i>	39		
<i>Behavioral techniques in combination with sedatives</i>	41		
<i>Emergency situations</i>	42		
Specialized pediatric dentists	42		
References	43		
5 Pain, pain control, and sedation	44		
<i>Magne Raadal, Stefan Lundberg and Gro Haukali</i>			
Methods of pain control	46		

Local analgesia and pain control	47	8 Radiographic examination and diagnosis	79
<i>Intraoral topical analgesics</i>	47	<i>Hanne Hintze and Ivar Espelid</i>	
<i>Local analgesic solutions</i>	47	Indications for radiographs in children and adolescents	79
<i>Methods of administration</i>	47	Principles for interpretation of radiographs	79
<i>Contraindications</i>	51	Radiographic anomalies and pathologies in children and adolescents	80
<i>Complications</i>	51	Caries and its sequela	80
<i>Toxicity</i>	51	<i>Intervals between bitewing examinations</i>	81
<i>Preparation of the patient</i>	52	Trauma to teeth and supporting tissue	82
General analgesia	53	Developmental and acquired dental anomalies	82
Conscious sedation	53	Systemic diseases and syndromes	83
<i>Indications and contraindications</i>	54	Treatment planning prior to orthodontics	83
<i>Oral and rectal administration of benzodiazepines</i>	54	Treatment planning prior to surgery	83
<i>Routes and doses</i>	55	Intraoral radiographic techniques	83
<i>Clinical considerations</i>	56	<i>Periapical radiographs</i>	83
General anesthesia	58	<i>Bitewing radiographs</i>	84
References	59	<i>Three-dimensional object localization radiographs</i>	85
6 Dental caries in children and adolescents	61	Extraoral radiographic techniques	86
<i>Marit Slåttem Skeie, Lill-Kari Wendt and Sven Poulsen</i>		<i>Panoramic examination</i>	86
Childhood dental caries as a health problem	61	<i>Scanography</i>	87
Epidemiology of dental caries in children and adolescents	62	<i>Computed tomography</i>	87
<i>Epidemiological data on dental caries</i>	63	Radiation protection	89
<i>Dental caries in the primary dentition of preschool children</i>	64	<i>Patient protection in general</i>	89
<i>Caries in the permanent dentition</i>	66	<i>Image receptor sensitivity</i>	89
Caries in children and adolescents in a changing society	67	<i>Beam collimation</i>	89
References	68	<i>Lead protection</i>	89
7 Case history and clinical examination	71	<i>Patient cooperation</i>	90
<i>Sven Poulsen and Lars Matsson</i>		References	90
Case history	71	9 Caries prevention	91
<i>The family history</i>	72	<i>Göran Koch, Sven Poulsen and Svante Twetman</i>	
<i>General medical history</i>	72	The importance and concepts of caries prevention	91
<i>Dental history</i>	73	How does caries develop?	92
Clinical examination	73	Evidence-based prevention	94
<i>General appearance</i>	73	<i>The randomized controlled trial</i>	94
<i>Examination of the head and neck</i>	73	<i>Where to find the evidence</i>	95
<i>Intraoral examination</i>	74	Basics of caries prevention	96
<i>Examination of the oral mucosa</i>	74	<i>Diet</i>	96
<i>Examination of periodontal tissues</i>	75	<i>Plaque control</i>	98
<i>Examination of teeth</i>	75	<i>Fluoride</i>	99
<i>Examination for temporomandibular joint problems</i>	77	<i>Fissure sealing</i>	102
<i>Examination of occlusion</i>	77	Preventive strategies	103
Records	77	<i>High-risk and population strategies</i>	103
References	78	Evaluation of caries risk in individuals	105
		<i>Background data and clinical evaluation of caries risk</i>	105
		<i>Risk ages</i>	107

Preventive and operative care: a coordinated approach	108	<i>Indices for dental erosion</i>	147
References	108	<i>Follow-up of patients with erosions</i>	147
10 Diagnosis and management of dental caries	110	Preventive policies	148
<i>Ingegerd Mejàre, Magne Raadal and Ivar Espelid</i>		<i>General aspects</i>	148
The concept of caries diagnosis	110	<i>Elimination of etiological factors</i>	148
Detection and assessment of the caries lesion (caries diagnosis)	110	<i>Population-based prevention</i>	149
<i>Assessing and grading lesion severity</i>	111	Restorative treatment	150
<i>Assessing and grading lesion activity</i>	111	References	151
Diagnostic tools	111	12 Pedodontic endodontics	153
<i>Visual-tactile and radiographic examination</i>	111	<i>Ulla Schröder</i>	
<i>Occlusal surfaces (pit and fissures)</i>	113	Diagnosis of pulp lesions in primary and immature permanent teeth	153
<i>Free smooth surfaces</i>	115	Should endodontic interventions be carried out in the primary dentition?	154
<i>Approximal surfaces</i>	115	<i>Endodontic techniques in primary teeth</i>	154
Alternative/supplementary diagnostic tools	116	<i>Stepwise excavation</i>	155
The concept of caries treatment	116	<i>Direct pulp capping</i>	156
<i>Nonoperative treatment</i>	116	<i>Partial pulpotomy</i>	156
<i>Operative (restorative) treatment</i>	117	<i>Pulpotomy</i>	157
<i>Indications for operative (restorative) treatment of primary teeth</i>	118	<i>Pulpectomy and root canal therapy</i>	157
<i>Treatment planning</i>	118	<i>Wound dressings and tissue reactions</i>	157
Restorative procedures	120	<i>Calcium hydroxide and MTA</i>	157
<i>Restorative materials: basic principles and handling</i>	120	<i>Formocresol</i>	158
Specific conditions for different age groups	121	<i>Ferric sulfate</i>	158
0–3 years	121	Complications (primary teeth)	159
3–6 years (primary teeth)	124	Follow-up and long-term prognosis (primary dentition)	159
6–12 years	128	Pulp therapy in immature permanent teeth	159
12–19 years	131	<i>Stepwise excavation</i>	159
References	137	<i>Partial pulpotomy</i>	159
11 Dental erosion	141	<i>Pulpotomy</i>	160
<i>Ann-Katrin Johansson, Göran Koch and Sven Poulsen</i>		<i>Pulpectomy</i>	160
Epidemiology	141	<i>Root canal treatment</i>	160
Etiology	142	Bleaching of nonvital discolored permanent teeth	161
<i>Gastroesophageal reflux (disease)</i>	143	Handling the emergency child patient	163
<i>Asthma</i>	143	<i>Pain at food intake</i>	163
<i>Eating disorders</i>	143	<i>Toothache at night</i>	163
Other factors associated with dental erosion	144	<i>Use of antibiotics</i>	164
<i>Drinking habits</i>	144	References	165
<i>Salivary factors</i>	144	13 Periodontal conditions	166
<i>Oral hygiene practices</i>	144	<i>Bengt Sjödin and Lars Matsson</i>	
Lifestyle	144	Normal periodontal conditions	166
Case history and clinical examination	145	<i>Primary dentition</i>	166
<i>Case history</i>	145	<i>Permanent dentition</i>	166
<i>Clinical examination</i>	146	Bacteria-induced inflammatory periodontal diseases	167
		Gingivitis	167
		<i>Clinical picture</i>	167

<i>Age-related differences</i>	167	15 Eruption and shedding of teeth	197
<i>Etiology</i>	168	<i>Göran Koch, Sven Kreiborg and</i>	
<i>Treatment</i>	170	<i>Jens O. Andreasen</i>	
Periodontitis	170	Chronology of normal tooth eruption	197
<i>Clinical picture</i>	170	<i>Primary dentition</i>	197
<i>Classification and epidemiology</i>	171	<i>Permanent dentition</i>	197
<i>Chronic periodontitis</i>	172	Mechanism and theories of tooth eruption	197
<i>Aggressive periodontitis</i>	172	Mechanism of shedding of primary teeth	200
<i>Etiology and risk factors</i>	173	Systemic disturbances affecting tooth	
<i>Screening and treatment</i>	177	eruption and shedding	200
Prevention of bacteria-induced inflammatory		<i>Premature tooth eruption</i>	201
periodontal diseases	178	<i>Delayed tooth eruption</i>	201
<i>Mechanical plaque control</i>	178	<i>Premature shedding of primary teeth</i>	202
<i>Chemical plaque control</i>	179	Local disturbances affecting tooth eruption	
Gingival recession	179	and shedding	203
Gingival enlargements	179	Local aberrations in primary dentition	203
Drug-induced gingival overgrowth	179	<i>Natal and neonatal tooth eruption</i>	203
Gingival fibromatosis	180	<i>Symptoms associated with "teething"</i>	203
Necrotizing periodontal diseases	180	<i>Fibrotic mucosa and eruption cysts</i>	204
Traumatic ulcerative gingival lesions	180	<i>Infraocclusion of primary molars</i>	204
Streptococcal gingivitis	181	<i>Retention of primary teeth</i>	206
References	181	Local aberrations in permanent dentition	206
14 Tooth development and disturbances	183	<i>Ectopic eruption</i>	206
in number and shape of teeth		<i>Ectopic malpositions</i>	207
<i>Göran Koch, Irma Thesleff and</i>		<i>Sequelae to trauma</i>	208
<i>Sven Kreiborg</i>		<i>Supernumerary teeth, mesiodentes, and</i>	
Mechanisms of normal and abnormal tooth		<i>odontomas</i>	208
development	183	<i>Ankylosis</i>	208
<i>Principles of tooth development</i>	183	<i>Developmental disturbances</i>	210
<i>Molecules regulating tooth development</i>	183	Background literature	211
<i>Disturbances in tooth development</i>	186	References	211
<i>Genetic causes of disturbed tooth</i>		16 Occlusal development, preventive,	212
<i>development</i>	186	and interceptive orthodontics	
<i>Hypodontia and abnormal tooth shape</i>	187	<i>Jüri Kurol and Bengt Mohlin</i>	
<i>Hyperdontia</i>	187	Occlusal development of the primary	
Clinical aspects	187	dentition	213
<i>Chronology of dental development</i>	187	Malocclusions in the primary dentition	214
<i>Dental age estimation</i>	188	<i>Etiology of malocclusion in the primary</i>	
<i>Terminology and definitions</i>	188	<i>dentition</i>	214
<i>Numerical variations in the primary</i>		<i>Prevalence of malocclusions in the primary</i>	
<i>dentition</i>	188	<i>dentition</i>	214
<i>Numerical variations in the permanent</i>		<i>Space conditions</i>	215
<i>dentition</i>	189	<i>Malocclusion in the vertical plane</i>	215
<i>Syndromes involving congenitally missing</i>		<i>Malocclusions in the sagittal plane</i>	215
<i>teeth</i>	189	<i>Malocclusions in the transversal plane</i>	217
<i>Treatment of children with missing teeth</i>		<i>Treatment need and cost-benefit for</i>	
<i>or hyperdontia</i>	189	<i>treatment of posterior cross bites</i>	218
<i>Morphologic abnormalities</i>	190	<i>Treatment of posterior cross bites</i>	218
<i>Odontomas</i>	195	Occlusal development through the mixed to	
Background literature	196	permanent dentition	219
References	196	<i>Front teeth</i>	220

<i>Lateral segment</i>	220	<i>Vitamin D-resistant rickets (familial hypophatasia)</i>	252
Malocclusions in the mixed (and permanent) dentition	221	<i>Celiac disease</i>	253
<i>Etiology of malocclusions</i>	221	Treatment	253
The pediatric dentist's approach to orthodontic problems	223	<i>Fluorosis</i>	253
<i>Prevention of malocclusions</i>	223	<i>Tetracycline defects</i>	254
<i>Interceptive orthodontics</i>	226	<i>Molar–incisor hypomineralization</i>	254
Supervising occlusal development in the primary and mixed dentition	227	<i>Amelogenesis perfecta</i>	256
<i>The primary dentition</i>	227	<i>Dentinogenesis imperfecta</i>	258
<i>Early mixed dentition (6–9 years)</i>	227	References	262
<i>Late mixed dentition (9–12 years)</i>	229		
<i>Young permanent dentition (12–15 years)</i>	230	18 Traumatic injuries: examination, diagnosis, and immediate care	264
General decisions for orthodontic treatment	230	<i>Ingeborg Jacobsen and Jens O. Andreasen</i>	
<i>Dissatisfaction with appearance</i>	230	Epidemiology	264
<i>Caries and periodontitis</i>	2310	Etiology	264
<i>Speech</i>	231	Examination	264
<i>Chewing function</i>	231	<i>History</i>	264
<i>Temporomandibular disorders</i>	231	<i>Medical history</i>	266
<i>The selection of orthodontic patients</i>	231	<i>Extraoral examination</i>	266
References	231	<i>Intraoral examination</i>	266
		<i>Radiographic examination</i>	267
17 Developmental defects of the dental hard tissues and their treatment	233	Diagnosis	267
<i>Ivar Espelid, Dorte Haubek and Birgitta Jälevik</i>		<i>Injuries to the hard dental tissues and the pulp</i>	267
Aspects related to tooth development	233	<i>Injuries to the hard dental tissues, the pulp and the alveolar process</i>	267
<i>Etiology of developmental dental defects</i>	234	<i>Injuries to the periodontal tissues</i>	268
Collection of information and treatment planning	235	<i>Injuries to gingiva or oral mucosa</i>	268
<i>Anamnestic information</i>	235	Immediate care: primary teeth	269
<i>Extraoral examination</i>	235	<i>Enamel and enamel–dentin fracture</i>	269
<i>Clinical characteristics of developmental dental defects</i>	235	<i>Complicated crown fracture</i>	269
<i>Diagnosis</i>	236	<i>Crown–root fracture</i>	269
<i>Classification</i>	236	<i>Root fracture</i>	269
<i>General treatment principles</i>	237	<i>Concussion, subluxation, and luxation injuries</i>	269
<i>Treatment planning</i>	237	Immediate care: permanent teeth	273
Environmentally determined dental defects	239	<i>Crown fractures</i>	273
<i>Localized defects of the dental hard tissues</i>	239	<i>Crown–root fracture</i>	275
<i>Generalized defects of the dental hard tissues</i>	240	<i>Root fracture</i>	276
Inherited defects of the enamel	244	<i>Concussion</i>	277
<i>Amelogenesis imperfecta</i>	244	<i>Subluxation</i>	278
Inherited defects of the dentin	246	<i>Extrusive luxation</i>	278
<i>Dentinogenesis imperfecta</i>	246	<i>Lateral luxation</i>	278
Disturbances in calcium/phosphate metabolism with relevance to mineralization of teeth	251	<i>Intrusive luxation</i>	278
<i>Rickets</i>	251	<i>Avulsion</i>	279
		<i>Injuries to the alveolar process</i>	281
		<i>Injuries to the gingiva and the oral mucosa</i>	282
		Prevention of traumatic injuries	282
		<i>Use of mouth guards</i>	282
		<i>Face masks</i>	283
		References	283

19 Traumatic injuries: follow-up and long-term prognosis	284	Taking the history in children and adolescents with suspected TMD	309
<i>Jens O. Andreasen and Ingeborg Jacobsen</i>		Clinical functional examination of the masticatory system	310
Wound healing events	284	Radiographic imaging of the TMJs	311
Primary teeth: follow-up and prognosis	286	Treatment of TMD in children and adolescents	311
<i>Pulpal and periodontal complications following trauma to primary teeth</i>	286	Summary	314
<i>Injuries to developing permanent teeth</i>	287	References	314
Permanent teeth: follow-up and prognosis	287		
<i>Prognosis following infraction and uncomplicated crown fracture</i>	288	22 Children with chronic health conditions: implications for oral health	315
<i>Prognosis following a complicated fracture</i>	289	<i>Göran Dahllöf and Luc Martens</i>	
<i>Prognosis following crown-root fracture</i>	289	Definition of CHCs	315
<i>Prognosis following root fracture</i>	289	Prevalence	315
<i>Prognosis following luxation injuries</i>	290	Increased risk for oral diseases in children with CHCs	316
<i>Prognosis following replantation</i>	295	CHCs	316
Treatment methods following loss of permanent incisors	295	<i>Asthma</i>	316
Predictors for healing complications	296	<i>Cardiovascular disorders</i>	319
<i>Development of an interactive Internet-based dental trauma guide</i>	296	<i>Chronic renal failure</i>	320
References	296	<i>Renal transplant</i>	320
		<i>Diabetes mellitus</i>	321
20 Oral mucous lesions and minor oral surgery	298	<i>Gastroesophageal reflux</i>	321
<i>Göran Koch</i>		<i>Eating disorders</i>	321
Oral mucous lesions	298	<i>Malabsorption</i>	322
<i>Herpetic gingivostomatitis</i>	298	<i>Celiac disease</i>	323
<i>Impetigo contagiosa</i>	299	<i>Cystic fibrosis</i>	323
<i>Aphthous ulcers</i>	299	<i>Primary and secondary immunodeficiency states</i>	323
<i>Oral candidiasis</i>	300	<i>Juvenile chronic arthritis</i>	325
<i>Traumatic lesions</i>	300	<i>Epidermolysis bullosa</i>	325
<i>Bohn's nodules</i>	300	<i>Bleeding disorders</i>	326
<i>Mucous retention cysts (mucocele)</i>	300	<i>Malignant disease in children</i>	327
<i>Epulides</i>	301	<i>Epilepsy</i>	328
<i>Hemangioma</i>	301	Preventive strategies in children with CHCs	329
<i>Lesions connected with common infectious diseases in children</i>	302	References	329
Surgical procedures	303		
<i>Extraction of teeth</i>	303	23 Dental care for the child and adolescent with disabilities	331
<i>Treatment of impacted teeth</i>	303	<i>June Nunn and Gunilla Klingberg</i>	
<i>Cysts</i>	306	Context	331
<i>Frenuloplasty</i>	306	Prevalence	332
Background literature	307	<i>Oral health and disability</i>	333
		Consent	334
21 Temporomandibular disorders	308	Neuropsychiatric disorders	334
<i>Tomas Magnusson and Martti Helkimo</i>		<i>Autism spectrum disorders: autism, Asperger syndrome</i>	334
Definitions	308	<i>Attention deficit hyperactivity disorder</i>	336
Epidemiology	308	<i>Tourette syndrome</i>	336
Bruxism	309	Other disorders	337
TMD and orthodontics	309	<i>Learning disability/mental retardation</i>	337

<i>22q11 deletion syndrome</i>	337	<i>Pit and fissure sealants</i>	344
<i>Fragile X syndrome</i>	338	<i>Oral hygiene aids</i>	344
<i>Down syndrome</i>	338	<i>Chlorhexidine</i>	344
<i>Cerebral palsy</i>	339	<i>Dental visits</i>	345
<i>Spina bifida</i>	340	Behavior management	345
<i>Muscular dystrophy</i>	342	Body posture	346
<i>Cleft lip and palate</i>	342	Oral motor function	346
Preventive dental care	343	References	347
<i>Diet</i>	343		
<i>Fluorides</i>	343	Index	349