# Index

Aarskog syndrome 114, 120
abfraction 60
abrasion of teeth 60
see also enamel demineralization and erosion
acetylsalicylic acid 48
achondroplasia 42, 105–6, 114, 148–9
acromegaly 43–4, 183, 184
actinomycosis 244, 248–9
activator appliance 220
acute necrotizing ulcerative gingivitis (ANUG) 244, 245
acute suppurative parotitis (ASP) 246–7
Addison's disease 50, 192
adenoid cystic carcinomas 327–30
adenoidectomies 201–3
adenoids 196–7
anomalies 197–201
investigations 222–7
removal 201–3
adhesives, biomimetic 375–6
adolescence 77
diet and food choices 89
adrenal disorders, general 192
adrenal insufficiency 183, 192
aerobic infections, affecting oral cavity 243–5
agenesis see dental agenesis
airway imaging 198–9, 222
airway obstruction
ENT referrals 197–201
impact on facial length 199–201
measurement and evaluation 198–9
otolaryngology 201–3
see also obstructive sleep apnea (OSA)
alcohol use 6
see also fetal alcohol syndrome
allergens 47, 373
allergic disorders 47
allografts 389, 403–18
see also alveolar bone grafts
alopecia totalis 9, 11
alveolar bone grafts 162–3, 401–2
contraindications 415–16
future research needs 418
harvesting methods 406–8
post-surgery evaluations 411–12
surgical protocols 408–11
transmucual penetration and cell rejuvenation 412–15
use of stem cell technologies 401–18
alveolar bone modelling 169–70, 171, 394–6
with stem cell technologies 401–18
alveolar cleft closures 162–3
alveolar drift 169–70
ameloblastic dysplasia 113
amelogenesis imperfecta 60–2, 109, 112, 114
American Board of Clinical Geneticists (ABMG) 110–11
anemia
hemolytic 47
sickle cell 47–8
angiomas, facial 39
Angle, Edward Hartley 2, 380
ankylosis of teeth 303–5
anorexia nervosa 60, 89
impact on orthodontic treatment 88
antidepressants 87
antipsychotics 87
antiviral agents 47
ANUG see acute necrotizing ulcerative gingivitis (ANUG)
anxieties over treatment, underlying causes 70
Apert syndrome 42, 113–14, 143–8
apexification techniques 293–5
apnea 214
see also obstructive sleep apnea
appearance concerns 69–70
appliances (general considerations)
cariogenic problems 286
pulpal reactions 286–8
see also biomedical engineering;
individual named appliances;
materials science
application service provider (ASP) solutions 17
appointment scheduling, IT software 16
archwires
coatings 371–2
mechanical properties 369–72
nonmetallic 368–9
surface properties 366–8
archwire-bracket friction studies 366–8
asthma 46
attention deficit hyperactivity disorder (ADHD) 77
attractiveness 72–3
ethno-cultural differences 75–6
perceptual basis 73–4
physical basis 73
quantitative analysis 74–5
audiovisual tests 206–7
autoimmune diseases 6–7, 39–40, 49, 114, 254–5
autoimmune polyendocrinopathy 114
autotransplantation 300–3
azotemia 47
bacterial infections 241–8
management principles 397–8
within oral cavity 243–5, 397–400
basal cell carcinoma (nevoid) 42, 112, 113–14, 123
Binder syndrome see maxillonasal dysplasia
bio-Oss 389
bioglass materials 389
biological status of patient 5–9
biomaterials 383–4
design requirements 383
see also tissue engineering
biomedical engineering
background and past research 366–73
archwire-bracket friction 366–8
fabrication of nonmetallic archwires 368–9
force measurements 372
mechanical properties of archwires 369–72
use of finite element analysis 372–3
current studies and potential applications 373–7
biomimetic adhesives 375–6
brackets with force measurement centres 375
self-cleaning materials 376–7
self-healing materials 374–5
shape memory polymers 373–4
see also tissue engineering
biomedical engineers 366
bisphosphonate treatment, jaw necrosis 174
blastomycosis 259
bleeding disorders 49, 50
bleeding index 398
Bloch-Sulzberger syndrome see incontinentia pigmenti
blood transfusions 49
cortical perforations 173
corticosteroids 173
corticotomies 173

cosmetic dentistry

gingival reshaping 430–1
see also individual orthodontic interventions

Costen's syndrome 470
CPAP therapy 228

craniofacial growth and development 4–5, 40
assessment methods and analysis 104–6
timing of orthodontic treatment 103–6
see also tooth morphogenesis

craniofacial growth and development anomalies 40–3, 96–107, 209
specific growth-related problems 98–100
trauma-related issues 100–3

craniofacial microsomia 122, 133–40
etiology 133–5
management 135–7
orthodontic treatments 137–40

craniofacial trauma 100–3
emergency orthodontic treatments 292–305

craniosynostoses 114, 123–4, 143–8
etiology 143–5
management 145
orthodontic treatments 145–8

Crohn disease 47
Cross syndrome 113

Crouzon syndrome 42, 114, 143–8, 149
crowding of teeth 53, 56, 58
crown fractures 292–3
cryptococcosis 259
CT data and DICOM 17–18

cyclic adenosine monophosphate (cAMP) 7–9
cysts, jaw 62, 64
cytomegalovirus infections 253–4

data management, overview 16–17
data recovery 29–32
data security 17, 28
encryption systems 33–4
malware problems 28–9

passwords and digital signatures 17
recovery measures and solutions 29–32
data storage 28

De Lange syndrome 113
debonding 305
deficiency states and malnutrition 43
impact on orthodontic treatment 5–6, 87–8

maternal 86
see also nutrition
delayed tooth eruption 113
see also dental eruption failures
dens invaginatus 55
dental agenesis 53, 54
associated conditions 114
dental caries 53–5, 56
in adulthood 87
cariogenic diets 86–7
definitions 86
interdisciplinary approaches 284–6
post-treatment remineralization 306

protective diets 87
resin infiltration 306–7
dental casts, infants 157–8
dental dysplasias, associated conditions and syndromes 113–14
dental eruption failures 121–2
associated conditions 113, 121–2
dental implants 444–68
anchorage considerations 177–9, 444–5
bone responses 177–9
case presentations 445–63
for forced eruptions 461–3
for holding molars vertical 445–6
for intrusion of molars 446–8
and surgical placement of microimplants 463–7
innovations 2
post-surgery complications 467
success rates 466
timing considerations 466–7
dental pulp 286
chamber narrowing 47
exposure risks 293
necrosis 293–4
preservation in young patients 293
problems associated with orthodontic treatments 286–8
regeneration technologies 388–9
tooth morphogenesis 382–3
dentin dysplasia 113
dentinogenesis imperfecta 60
dentition examinations 53–60
chronological age and maturation 53
dental caries 53–5
disorders of eruption 58–60
numbers of teeth 53
pigmentation and discolorations 58, 59–60
shape anomalies 55–8
size anomalies 55
depression, post surgery 361
dermatitis 47
dentition

development of craniofacial structures see craniofacial growth and development
development stages (general) see child and adolescent development
diabetes mellitus 6–7, 44–5, 89, 183, 191–2
diagnosis 37–64
approaches and collaborations 4, 37–8
computer-aided systems 17–22
template-guided 345
‘diet’ cf. ‘nutrition’ 83–4
dietary problems
cariogenic foods 86–7
see also eating disorders; obesity
dietary recommendations 84–6
see also deficiency states and malnutrition; nutrition
dietary supplements 86
differential scanning calorimetry (DSC) 369–72
difficult patients
body dysmorphia 79
borderline personality 79–80
narcissistic personalities 79–80
and patient compliance 78–80
perfectionist personalities 78–9
search engine information 80
DiGeorge syndrome see velocardiofacial syndrome
digital photography 17–18, 19–20
outsourcing 20
predicted post-treatment profiles 21–2, 24
digital radiography 18–21
dilacerations see root dilacerations
diode lasers 424
discoloration
oral mucosa 51
teeth 58, 59–60
distraction osteogenesis 305
Don Quixote (Cervantes) 70
Down syndrome 40, 52, 113–14, 117
orthodontic interventions 492–7
dream interpretations, tooth loss 70
drug users 46
dry mouth see xerostomia
DUTCHELCLEFT trial 158–9
dwarfism 113
dynamic mechanical analysis (DMA) studies 369–72
dyskeratosis congenita 113
dysostosis see cleidocranial dysplasia
dysphagia, family history 112
dysplasias see connective tissue dysplasias;
dental dysplasias
E-models 18, 20–1
ear pain 209–10
eye-onset periodontitis 113, 115–16
ear, nose and throat (ENT) specialists 195–211
anatomical associations 195–6
common anomalies 196–7
joint concerns (ENT-orthodontic) 197–211
airway obstruction 197–204
cleft lip and palate patients 156, 209
conductive hearing loss 204–9
craniofacial anomalies 209–10
temporomandibular dysfunction 210–11
key areas of interaction 196
eating disorders 60, 88–9
ectodermal dysplasias 113, 115
ectomesenchymal progenitor cells 382
Index
507

partnership working see interdisciplinary approaches

Pierre Robin complex 42

pituitary gland 43–4

anomalies 43–4, 184

placebo trials, for TMD treatments 479

plagiocephaly 103

platelet-derived growth factor (PDGF) 388

PLGA see poly-lactic-co-glycolic acid

(PLGA)

pneumonia 262

poly-lactic-co-glycolic acid (PLGA) 383–4

polyglycolic acid (PGA) 384

polymeric archwires 368–9

shape memory materials 377

polyoxometalates (POMs) 377

post-surgery complications 357–61

posterior crossbites 272–5

practice management systems (PMS) 16

benefits 16–17

software comparisons 16

pre-prosthetic treatments 313–30

benefits and rationale 313–14

case studies 314–20

predicted post-treatment imagery 21–2, 24

premature delivery 262

premature tooth exfoliation 115–18

associated conditions 113, 116–18

premaxillary agenesis syndrome 114

‘pressure’ responses 175

primary adrenal insufficiency 183, 192

primary failure of eruption (PFE) 58–60, 121, 303

primary herpetic gingivostomatitis 250–2

priming (laser therapies) 424–5

progeria 113

prognathism 184

prosthodontic treatments 122

following maxillectomy 327–30

for radiation therapy 326

protein (dietary) 85

protruding jaw see prognathism

psychiatric jaw see prognathism

psychosocial factors 9, 69–80

emotional and behavioral influencing factors 71–2

function vs. quality of life 69–70

pulp see dental pulp

pyknody sostosis 113

quality of life issues 69–70
rachitic disorders see rickets
radiographic examinations
initial evaluations 62
of genetic anomalies 112–15
radiography, digital imaging 18–21
radiotherapy treatments, use of interim
obturators 327–9
Ramon syndrome 113
rapid maxillary expansion (RME) 207–9, 220–1
rapid palatal expansion (RPE) 248, 348
rebooting computer systems 30–1
recurrent aphthous stomatitis 242
red blood cell defects 47
referral systems 38
reflux disease 47, 60
regeneration technologies 385–8
regional acceleration phenomenon (RAP) 173, 176–7
remineralization
fluoride applications 306
natural 306
remodelling see bone remodelling
remote frame buffer (RFB) protocol 26
renal diseases 47
replantation techniques 298–9
replantation technologies 298–9
root resorption 174
root fractures 293–6
root resorption 174
causes 2–3, 174
invasive cervical forms 291–2
investigations and diagnosis 289
key locations 288–9
orthodontically-induced 288–92
predisposing factors 289
tratements 289–90
Rothmund-Thomson syndrome 113
Rutherford syndrome 113
SAD see selective alveolar decortication (SAD)
Saethre-Chotzen syndrome 113–14, 123
saliva
artificial 87
protective role 87
see also xerostomia
scaffold materials 383–4
see also tissue engineering
scar tissue, cleft lip and palate patients 163–4
sclerosteosis 113
screw devices see skeletal anchorage
Seckel syndrome 113
sedation risks, with special needs children 489
seizure disorders 45
selective alveolar decortication (SAD) 401–2
self-cleaning materials 376–7
self-concept 70–1
and adolescence 77
post-surgery changes 360–1
self-healing appliance materials 374–5
self-ligating brackets 367
sex chromosome aneuploides 42, 55, 112–15
shape memory polymers 373–4
short stature 41, 43–4
SHORT syndrome 113
dicile cell anemia 47–8
signaling molecules 384
Singleton-Merten syndrome 113–14, 116
sinus problems, post-surgery 360
sinusitis 244, 247–8
skeletal anchorage 444–68
bone responses 177–9
case presentations 445–63
forced eruption 461–3
holding molar vertical 445–6
intrusion of molars 446–8
molar uprighting 453–60
surgical placement of microimplants 463–7
interactive approaches 445
post-surgery complications 467
root damage 467
success rates 466
timing considerations 466–7
types of device 444–5
skull trauma 100–3
sleep-disordered breathing (SDB) 215–16
see also obstructive sleep apnea
smart brackets 374–5, 376
smart materials 377
'smile esthetics', gingival reshaping 430–1
SMMCII see solitary median maxillary central incisor (SMMCII)
snack foods 85, 86, 89
sodium intake 85
soft drinks 88
soft tissue examinations 50–2
soft tissue lesions 51–2
laser excisions 439–40
software comparisons, practice
management systems (PMS) 16
solid-state lasers 425
solitary median maxillary central incisor
(SMMCII) 114, 120, 184
special needs children 485–98
access arrangements 485–6
care management principles 486–7
case studies 490–7
cerebral palsy patients 490–2
Down syndrome patients 492–7
deciding treatment plans 487–9
particular considerations 489
relapse and retention 489
sedation risks 489
speech pathology, for CLP patients 156
sporotrichosis 260
SSEA3/4 markers 382–3
Staphylococcus aureus 243, 244
statins 5
stature see physical growth (stature)
stem cell science 381–3, 392–419
background history 393–400
bone and attachment levels 393–4
bone restructuring developments 394–6
risks of infection and gingival
enlargement 397–400
contraindications 415–16
future research needs 418
key principles and processes 401–2
new technologies 400–18
for facial regeneration 385–6
see also tissue engineering
steroids 5, 39
iatrogenic root resorption 47
impact on bone remodelling 173
inhaled 46
Stickler syndrome 113–14, 127
Stillman clefts 53
stomatitis (recurrent aphthous) 242
Streptococcus mutans studies 373
substance misuse 46
sucking habits 97–8
sugar
cariogenicity 86–7
daily intake guidelines 85
definitions 86–7
supernumerary teeth 53–4, 56
associated conditions 113, 118–20
and cancer 120–1
supportive parotitis 244, 246–7
surgical interventions see laser therapies;
surgically-facilitated orthodontic
therapy (SFOT)
surgical screws 177–9
see also dental implants
surgically-facilitated orthodontic therapy
(SFOT)
bone graft procedures 405–9
cleft lip and palate 160–2
midface (malar) deficiencies 160–2
post-graft/implant flap surgery 409–11, 467
replantation techniques 298–9
skeletal anchorage and dental implants
177–9, 444–63
skeletal jaw imbalance case studies 332–64
swallowing difficulties see dysphagia
symbolism and teeth 70
syndromic hypodontia, associated conditions 120
syphilis 39–40, 244, 249–50
systemic fluorosis 58, 59
talon cusp 55–8
tauromodontism 55, 112–15
telemedicine 27
temporomandibular dysfunctions 47, 210, 470–81
background to studies 470–2
causes 471–2
characteristics of patients 472
classifications 472
controversies and role of orthodontics 472–4
key theories 473
centric relation controversy 474–7
functional occlusion 477
internal derangements and 'need to treat' 477–9
diagnosis and investigations 471
multidisciplinary treatment options 480
post-surgery complications 360
treatment controversies 479–80
temporomandibular joint (TMJ), clinical examination 60–2, 471
template-guided diagnosis 345
tensile stressors 175
'tension' responses 175
tetracycline 58, 60
thalassemia 47, 62
3D images 18–21
thumb sucking 98
thyroid disease 183, 184–5
thyroid gland 44
thyrotoxicosis, juvenile 44
thyroxine 184–5
tissue engineering 380–9
definitions 380
impact on orthodontics 384–8
key principles and processes 381–3
role of signaling molecules 384
types of scaffolds 383–4
use of biomaterials 383–4
tissue rebounding 395, 430–2
titanium oxide coatings 377
TMJ see temporomandibular joint (TMJ)
tongue
clinical examination 52, 222–4
enlargements 184
tongue thrusting 97–8, 99
tongue-retainer devices 228
tonsils 196–7
anomalies 197–200
grading systems 224
investigations 222–7
removal 201–3
tooth absence see dental agenesis
tooth avulsion 297–8
tooth eruption delays see delayed tooth eruption
'tooth fairy' issues 70
tooth loss complete 297–8
fears and anxieties 70
replantation and stabilization techniques 298–301
trauma-related 297–8
see also premature tooth exfoliation
tooth morphogenesis 382–3
tooth movement 'with bone' see bone modelling
tooth regeneration technologies 385–8
tooth shape anomalies 55–8
tooth size anomalies 55, 57
toothpastes, abrasive 60
torticollis 103
training see orthodontic education
transmucal penetration (TMP) 412–15
transplantation technologies 385–6
see also allografts
trauma see craniofacial trauma
Treacher Collins syndrome 42, 113, 127
etiology 140
management 140–2
orthodontic treatments 142–3
treatment consent see patient consent
trichodontodentosseous syndrome (TDO) 112, 113
trichorhinophalangeal syndrome 113–14, 119–20
Trisomy-18 113, 115
tuberculosis 249
Turner syndrome 55, 112–15, 183, 192–3
2D facial photo wrap 17–19
tympanometry 207
ulcerative colitis 47
ulcers, non-healing 51, 242
unilateral posterior crossbites 272–5
van der Waals forces 375
van der Woude syndrome 114, 127–8
varicella zoster infection 252–3
vascular compression problems 287
velocardiofacial syndrome 113–14, 124–5, 143
video teleconferencing 26–7
viral hepatitis 46–7
viral infections 250–6
clinical appearances 251
oral cavity 244, 247–8, 250–6
treatments 251
virtual patient records 32–4
virus infections (software) 28–32
vitamin A, toxicity 88
vitamin B(2) 86
vitamin C, deficiencies 43, 86, 87–8
vitamin D
deficiencies 43
hydroxylation pathways 6
toxicity 86
vitamin K, deficiency 88
voice over internet protocol (VoIP) 26
von Willebrand's disease 49
Waardenburg syndrome 114
Waldeyer's ring 196
web conferencing 27
white sponge nevus 51
white spot lesions, interdisciplinary treatment approaches 284–6, 306
'whole bone' models 403
Wi-Fi phones 26
Wildervanck-Smith syndrome 113
Wilkie oculo-facio-cardio-dental syndrome 114
Williams syndrome 113, 115
Wolf-Hirschhorn syndrome 114
X-linked hypophosphatemic rickets 114–15, 116–17, 183, 188
xerostomia 45, 87
causes 87
yeast infections 256, 257–9
zinc 86