Index

Page numbers in *italics* refer to figures.
Page numbers in **bold** refer to tables.

Aadva™ abutments (GC Advanced Technologies), 70
acid treatment of surfaces, 143
acrylic crowns, 171, 171–172
adjustment of abutments
  extra-oral procedures, 127–128
  instrumentation, 122–127
  cleaning and sterilizing, 178–179
intra-oral procedures, 128–132
airbag effect
  zirconia structure, 137
alignment drill
  BioHorizons surgical protocol, 152, 154, 155
Allen keys *see* hex drivers
alumina abutments, 49
alveolar resorption prevention, 82–83
anatomically-designed bases
  sulcular stretching, 97, 98
anatomic limits
  one-piece implants, 144–146, 148
  angulation of abutments, 48, 170
  one-piece implants, 145–146, 147
  screw-retained, 111
  stock, 19–20
Ankylos cone screw connection, 41
antirotational features
  cone screws, 40
Astra abutments, 50, *see also* Atlantis™ abutments
Astra cone screw connection, 41
Astratech implant, 89, 90, 92
Atlantis™ abutments, 66–101
  cast abutments vs, 97–99
  clinical examples, 86–99
  finishing, 76–77
  inspection, 77–78
  milling, 67–68, 73–76
  ordering, 78–82
  Procera® technology vs, 88–89
  sulcular stretching, 82–86, 93–97
  virtual design, 69–73
augmentation of tissues, 103
autoclaves, 179
bacterial colonization
  connection types, 36
  PEEK vs titanium, 14
  zirconia, 12–13
baddeleyite, 8
beam-type wrenches, 28
beveled joints, 38
Bicon taper, 37, 39–40
biofilm, 2
BioHorizons implants
abutments, 51
internal connections, 37, 38
one-piece, 135, 139, 140–141
angulation, 170
chamfer margins, 168
resorbable blast texturing, 134, 143, 144
surgical protocol, 152–157, 170
biologic width, 1, 49, 51, 54
one-piece implants, 134
Biomet 3i, see also Encode System™
abutment, 49–50
connection, 37, 38–39
black band
cutting instrument for titanium, 122–124
black stone wheel
for zirconia, 126, 127–128
‘black triangle’, 107
blanching
sulcular stretching, 84, 88, 97
blasting processes
implant surfaces, 134, 142–143, see also resorbable blast texturing; sand-blasted surfaces
blue band
cutting instrument for titanium, 123, 124
blue band diamond instruments
for zirconia, 128–129, 130–131
bone
physical properties, 12
bone volume
one-piece implant surgery, 148, see also anatomic limits
Branemark abutment, 47
Bredent whiteSKY™ implant, 135, 139, 141–142
finish line, 168–170
surfaces, 142, 145
surgical protocol, 159–162, 163
Brezirkon® (material), 141
bruxism, 146
buccolingual width, 148
burn-out components, 66
burs, 124, 163–168
sterilization, 179
butt joints, 38
CAD/CAM systems, 20, 65–101
abutments for sulcular stretching, 84, 93–97
casting vs, 97–99
clinical examples, 86–99
finishing abutments, 76–77
milling, 73–76
virtual design, 69–82
without virtual design, 100
cam tube (Camlog), 43, 44
carbine
sterilization, 179
carriers
Implant Direct systems, 51
case selection
one-piece implants, 144–148
cast abutments
Atlantis™ abutments vs, 97–99
cast gold, 7–8
cast metal fixed provisional restorations, 104, 106
casts see master cast
CELAY system, 65
cementable recesses, 47
cementation
internal, 66
provisional restorations, 173
cement-retained provisional restorations, 109–110, 118–119, 120
CeraRoot™ implants (Oral Iceberg), 136, 139, 141–143, see also ICE surface finish lines, 142, 169
surgical protocol, 159–167
CEREC systems, 65–66
cervical collars, 48–66
RePlant™ abutment (Implant Direct), 59
‘click’
3i Osseotite Certain, 39
closed tray technique
impressions, 115–116
coatings for titanium, 3
screws, 26
cold sterilization, 179
cold welds
Morse taper connections, 39, 40
collagen fibers, 1–2, 49, 51, 54
collapsed bite, 147
coloring, see also titanium nitride
zirconia, 11–12, 136
commercially pure titanium, 3, 12
retaining abutment screws, 25
compliance by patient, 143–144
compressive strength
values, 12
computer-aided design see CAD/CAM systems
computer-guided finishing
hand polishing vs, 76, 77
cone screws, 39, 40–41
connection segments, 17, 18
connection types, 26–27, 33–46
connective tissue, 1–2, 49
contouring
  implant sites, 103, 107–111
contour soft tissue (emergence width option), 81
copings for impressions, 69, 71, 94, 96, 111
closed tray technique, 115–116
open tray technique, 113–114
screw-retained provisional restorations as, 110
costs
  prefabricated abutments, 49
counterpart teeth
  measurement from, 82
countersinks
  CeraRoot™ implants (Oral Iceberg), 159
  Z-Systems Z-Look3 Evo® implant, 159
CPT4 see commercially pure titanium
CP titanium see commercially pure titanium
crestal drills
  Bredent WhiteSKY™ surgical protocol, 163
cross-bite, 147
crowns, 111–120
  provisional, 171, 172
  RePlant™ abutment (Implant Direct), 59–63
  sulcular stretching, 84, 85
crystal structure
  zirconia, 9, 10, 136
customized abutments, 20, 21–22, see also CAD/CAM
  systems
costs, 49
  inspection, 77–78
  prefabricated abutments vs, 49
cutting instruments
  for titanium, 122–124
dark blue pre-polishers, 124
deep bite, 147
‘dense bone’ drill, 149, 150
dental hygiene procedures
  titanium nitride, 77
dentures, 172, 173
dePTH
  one-piece implants, 149
  subgingival depth, 80
detorque (reverse torque), 23
diamond instruments, 125–132, see also green
diamond stone wheel; red tapered
diamond
diamond silicone polishers, 126–127, see also pink
diamond polisher
disinfection, 177–178
  forbidden ingredients, 177
driver fitting sites
  retaining abutment screws, 24
dry heat sterilization, 178–179
duplicate abutments, 99
  Atlantis™ abutments, 78
  Easy Abutment (Nobel Biocare), 54–59
  edentulous ridge tissue
    sulcular stretching and, 84
elasticity
  values, 12
electronic torque drivers, 27, 56
  emergence width options, 80–82
  Encode System™, 68, 70
  Essix retainer, 104, 172
  esthetic zone
    angulation of abutments, 170
    connection types, 36
    soft tissue relationships, 102–121
etching, 143
Etkon abutment (Straumann), 70, 93, 94–96
external connections, 27, 33
  hex, 34–35
extracted tooth
  alveolar resorption prevention, 83
  as pontic, 105
extraction technique, 148
fiber-reinforced resin-bonded fixed prostheses, 104, 105
final restorations, 111–120, 147, 173–175
  cement-retained, 115–120
  screw-retained, 111–115
  virtual design, 72, 97
finger torqueing, 27
finishing instruments
  for titanium, 123–125
  for zirconia, 126–127, 129–130
finishing procedures, 76–77
finish lines, 167–169
  CeraRoot™ implants (Oral Iceberg), 143, 169
  Zimmer Dental one-piece implant, 140
fixed partial dentures, 172, 173
fixed provisional restorations, 103–104
flame-shaped instruments
  blue band, 129, 130–131
  red band, 130
flapped vs flapless techniques
  one-piece implants, 148
flared design
  Zimmer Dental one-piece implant, 140
flexural strength
  zirconia, 74
force distributions
  internal connections, 35
fracture
  alumina abutments, 49
  of screws, 28–31
Frialtit-2 internal cylinder connection, 41, 42
friction-fit joints, 35, 37–41
friction grip diamond kit (Vitality), 128–129
full arch restorations, 89, 91
GC Advanced Technologies
   Aadva™ abutments, 70
Genesis implant system, 51, 53
GingiHue® abutment, 49, 50
gingiva
   one-piece implant surgery, 148
Glidewell
   Inclusive® Implant Abutment, 70
gold, 3t, 14
cast, 7–8
costs, 49
   retaining abutment screws, 26, 35
gold color titanium surfaces see titanium nitride
gray fine polisher
   for zirconia, 127, 128
green diamond stone wheel, 125, 127
speed, 128
green zirconia, 74
grooves
   retentive, 80
handpieces
   Vitality instruments, 122, 125
hand polishing
   computer-guided finishing vs, 76, 77
healing abutments, 86, 89–93, 107, see also provisional restorations
healing caps, 81, 171, 172
heat
   from abutment preparation, 163
height reduction
   abutments, 163, 168
hexagonal connections, 34–35
   internal connections, 37–39, 41–42
hex drivers, 28, 29
Hex-Lock™ abutments, 51
HIP-sintered zirconia, 10
hot isostatic pressing (HIP), 137
hygiene, 2–3, 177–179, see also dental hygiene
   procedures
   zirconia, 12–13
ICE surface, 143, 145
immediate placement, see also loading, immediate one-piece implants, 148
implant connection segments, 17, 18
Implant Direct
   connection types, 43
   implant systems, 51, 53
   methods, 59–63
impression caps, 173
impressions, 59, see also copings for impressions
   Atlantis™ abutments, 67, 69, 71
final restorations, 173
   provisional restorations, 107, 110–111, 113–114, 115–116
   incisions
      sulcular stretching vs, 85
incisors
   angled, 147
   Atlantis™ abutments, 86–87
Inclusive® Implant Abutment (Glidewell), 70
inflammatory response
   cement-retained provisional restorations, 109
   sulcular stretching, 97, 98
   zirconia, 13
inspection
   customized abutments, 77–78
   of instruments, 178
instrumentation, 122–132
   cleaning and sterilizing, 178–179
   extra-oral adjustment techniques, 122–128
   intra-oral adjustment techniques, 128–132
   interchangeable components, 26
   interdental papillae, 107, 108
   interim removable partial prostheses, 104–106, 107, 108
   internal abutments
      rejection rates, 78
   internal cementation, 66
   internal connections, 27, 33, 35–44
      hexagonal connections, 37–39, 41–42
   internal cylinder hex see internal connections under hexagonal connections
   intra-oral adjustment
      zirconia, 128–132
irrigation see water spray
   joint strength
      connection types, 36
   junctional epithelium, 1
Keystone abutments, 51, 53
   Keystone connection, 43, 44
Laser-Lok™, 14, 49
   micro-channels, 51, 54
   surfaces
      machined titanium vs, 6
      transmucosal collar, 3t
   lateral incisors
      Atlantis™ abutments, 86–87
   light blue fine polishers, 124, 125
   lingual insertion
      transversal screws, 116
   loading
      esthetic zone, 107
      immediate, 133, 170, see also immediate placement
      one-piece implants, 170–171
   local anesthesia
      sulcular stretching, 96
   loosening of screws, 24, 27, 34–35, 38
machined titanium
  polished titanium vs, 4, 14
macro-geometry
  one-piece implants, 138–143
manual inspection, 78
margin design, 80
master cast
  Atlantis process, 69
  mesh view, 73
mesiodistal distance, 148
meso abutments, 109–110
metal-ceramic abutments, 48, 60, 106, 111, 116, 120
metal connections
  Procera® technology, 68
microbial seals
  connection types, 36
micro-channels, 6, 49, 51, 54
micro-cracks
  zirconia, 137
micro-geometry
  one-piece implants, 142–143, see also surfaces
micro-stops
  hex flats, 35
Microtexture MTX™ surface (Zimmer), 134
milling, 67–68, 73–76
‘mini-implants’, 133
modification see adjustment of abutments
modulus of elasticity
  values, 12
moment of force see torque
monocline structure
  zirconia, 10, 136, 137
Morse taper connections, 27, 36, 39–40
MTX process (Zimmer), 143, 144
MTX surface (Zimmer), 134
mucosal seal, 1–2
multiple tooth replacement
  one-piece implants, 147
narrow abutments, see also emergence width options
  platform switching, 36
narrow connections
  external, 34
narrow-diameter implants, 133, 144, 146
Neoss abutments, 51, 53
Neoss spline connection, 42–43
nickel, 6
Nobel Biocare, see also Procera® technology:
  TiUnite™ surface
  connection types, 43
one-piece implant, 134, 135, 138–139, 140
  angulation, 170
  chamfer margins, 168
  provisional restorations, 171
single tooth replacement, 54–56
surgical protocol, 149, 150–152
tri-channel connection, 43
two teeth replacement, 56–59
non-sintered zirconia, 74
non-surgical placement technique, 93–97
no tissue displacement (emergence width option), 80–81
occlusion, 146, 147
one-piece abutment–crowns
  sulcular stretching, 97, 99
one-piece implants
  case selection, 143–148
  macro-geometry, 138–144
  materials, 136–138
  micro-geometry, 142–143, see also surfaces
  preparation, 133–176
  surgery, 148–163
open tray technique
  impressions, 113–114
Oral Iceberg CeraRoot™ implants, 136, 139, 141–142, see also ICE surface
  finish lines, 142, 169
surgical protocol, 163
ordering
  Atlantis™ abutments, 78–82
  Osseotite Certain™ see connection under Biomet 3i
osteotomy
  preparation, 148
outcropping
  sulcular stretching, 84, 86, 97, 99
ovens
  for sterilization, 178–179
overcontouring
  for sterilization, 178–179
periodic table, 5f
periodontal disease, 3
perio probes, 155
periotomes, 148, 149
pilot drills
CeraRoot™ implants (Oral Iceberg), 164
Nobel Biocare, 149, 150
whiteSKY™ implant (Bredent), 157, 161
Zimmer One-Piece, 153
pink diamond polisher, 128
pink porcelain, 93, 95
plaque, 2
platform switching, 13, 36–37, 39
polished titanium
machined titanium vs, 4–6, 14
polishing instruments, see also hand polishing:
   smoothing
   for titanium, 123–125
   for zirconia, 126–127, 128
polyether ether ketone (PEEK), 13–14
pontics, 83–84, 104, 105, 108
porcelain, 7–8
pink, 93, 95
powders
   zirconia, 11
prefabricated abutments, 47–64, see also stock abutments
   adjustment procedures, 124–125
   cement-retained provisional restorations and, 109
preload, 23
   design modifications for, 34–35
   optimizing, 27
prescriptions
   Atlantis™ abutments, 78
pre-sintered zirconia, 9, 11
pressing
   hot isostatic (HIP), 137
   zirconia, 11
pressures
   autoclaves, 179
   primary stability, 146–147
Procera® technology, 68, 70, 88–89
prosthesis connection segments, 17, 18
prosthetic screws see retaining abutment screws
protected loading protocols
   zirconia, 172
provisional restorations, 103–111, see also healing abutments
   alveolar resorption prevention, 82–83
   cementation, 173
   cement-retained, 109–110, 118–119, 120
   one-piece implants, 171–175
   screw-retained, 110, 111
   crowns, 111–115, 117
   purple pre-polisher
      for zirconia, 126–127
RBT (resorbable blast texturing), 134, 142, 144
recontouring, 86, 93
red band
   cutting instrument for titanium, 123, 124
red band diamond instruments, 129–130, 131, 132
red tapered diamond
   for zirconia, 126, 127, 128
rejection rates
   internal abutments, 78
releasing incisions
   sulcular stretching vs, 85
removable partial dentures (RPD), 172
removable provisional options, 103, 104–106, 107, 108
removable soft tissue reproductions
   Atlantis process, 69
replacement of tools
   milling machines, 74
RePlant™ abutment (Implant Direct), 59–63
resin-bonded fixed prostheses (RBFP)
   cast metal, 104, 106
   fiber-reinforced, 104, 105
resorbable blast texturing (RBT), 134, 143, 144
retaining abutment screws, 23–32
   failure, 28–32
   gold, 26, 35
   loosening, 24
   external connections, 34–35
   mechanics, 24–25
   retentive grooves, 80
   retorquing, 24, 27
   reverse torque, 23
   rinsing, 177, 178
   rotational capability, 48
   rotational misfit, 35
   roughness, 4, 49, 77, 134, 143
sand-blasted surfaces, 130
screw drivers, 27–28, 29
   fitting sites, 24
   screw-retained provisional restorations, 110, 111
   crowns, 111–115, 117
   screws, see also cone screws; retaining abutment screws
   loosening, 24, 27, 34–35, 38
Screw-Vent® system, 37, 38
seals
   microbial
      connection types, 36
   mucosal, 1–2
self-check systems
   milling machines, 74
settling, 24
shanks, 24
shoulder morphology
   for sulcular stretching, 97, 98
shrinkage
   sintered zirconia, 74, 76
silicone keys
  Etkon abutment (Straumann), 94–95
silver-colored titanium, 76
single tooth replacement, 89–93
  Nobel Biocare, 54–56
  virtual modeling for, 69–72
sintering of zirconia, 74, 137
  temperatures, 9, 74, 76
slip-fit joints, 41–43
SLM process
  implant surfaces, 143, 145
slot drivers, 28, 29
smoothing, 170, see also polishing instruments
snap caps
  impressions, 59
'soft bone' drill, 149, 150
soft denture reline material
  Atlantis process, 69, 71
soft tissue
  displacement, 80–82
  esthetics and, 102–121
  removable reproductions
  Atlantis process, 69
  response to zirconia, 169, 172
Southern Implants
  connection types, 43
space limits
  one-piece implants, 143–146, 148
  Spiralock technology (BioHorizons), 38
spline connections, 42–43
splinting
  prescriptions for, 78
stability
  primary, 146–147
stainless steel, 6, 14
steam sterilization, 178, 179
sterilization, 178–179
stock abutments, 17–20, see also prefabricated abutments
stone pours
  Atlantis process, 69, 72
storage of instruments, 179
Straumann abutments, 51, 52, 70, 93, see also Etkon abutment
Straumann cone screw, 40
Straumann kits, 51, 52
stripping
  screws, 31–32
subgingival depth, 80
sulcular stretching, 82–86, 93–97, 98, 99
  blanching, 84, 88, 97
  contraindications, 96
support soft tissue (emergence width option), 81
surfaces
  one-piece implants, 134, 143, 145
  sand-blasted, 135–136
smooth vs rough, 3–6, 49, 77, see also roughness
TiUnite™ (Nobel), 134, 139, 143, 144
surgical protocols for one-piece implants, 148–163
BioHorizons, 152–157, 169
Bredent WhiteSKY™, 157–163
Oral Iceberg CeraRoot™, 159–163
Zimmer Dental, 149–152, 153
Z-Systems, 152–159
synOcta™ attachment (Straumann), 40
taper, see also Bicon taper; Morse taper connections
  BioHorizons connection, 37, 38
hex flats, 35
Temp Bond cement, 59
tensile strength values, 12
tetragonal structure
  zirconia, 10, 136–138
threads
  BioHorizons one-piece implant, 139, 141
  retaining abutment screws, 24–25
thread timing, 47
thumb driver, 29
tightness see torque
TiN see titanium nitride
tissue displacement, 80–82
titanium, 3t, 3–6, 14
  adjustment instruments for (Vitality Laboratory), 122–124, 167
  adjustment techniques, 122–125
  burs to prepare, 163
  customized abutments, 20
  one-piece implants, 134–136, 139, 145, 147–148
  loading, 170–172
  provisional restorations, 171–172
  retaining abutment screws, 25–26
  zirconia vs, 136
  hygiene, 12–13
  one-piece implants, 147–148
  titanium alloy, 4, 12
  retaining abutment screws, 26
  titanium nitride, 4, 6f, 76, 77, 89, 90
  BioHorizons one-piece implant, 139–141
  TiUnite™ surface (Nobel), 134, 138, 143, 144
toggle-type wrenches, 27, 28
  torque, 23, see also electronic torque drivers; retorquing
  loss (settling), 24
  optimizing, 27
torque-limiting devices, 27, 28
Torx drivers, 28, 29
transgingival segments, 17, 19
transversal screws, 116
tri-channel connections, 43, 44
try-in implants
  BioHorizons one-piece implant, 154, 155
  Zimmer Dental, 149, 153
tulip-shaped transmucosal area
  Z-Systems Z-Look3 Evo® implant, 140
twist drills
  whiteSKY™ implant (Bredent), 159, 161
  Zimmer Dental one-piece implant, 153
  Z-Systems Z-Look3 Evo® implant, 152
two teeth replacement
  Nobel Biocare, 56–59
  virtual modeling for, 69–72
UCLA abutments, 7–8, 20, 48, 66
  CAD/CAM manufacturing, 99–100
UCLA plastic sleeve, 66
ultrasonic cleaning of instruments, 178
ultrasonic instruments
  scalers, 28
  screw fragment removal, 30–31
vacuum-formed retainers see Essix retainer
vestibular incisions
  BioHorizons one-piece implant placement, 157
virtual design
  final restorations, 72, 97
virtual tools, 66–67, 69–72, 73, 74, see also CAD/CAM systems
  inspection by, 77–78
  measurement from counterpart teeth, 82
  recontouring with, 86, 93
Vitality Laboratory adjustment instruments
  for titanium, 122–124, 167
  for zirconia, 125–129, 167
water spray
  abutment preparation, 163
  intra-oral abutment adjustment, 128
  milling, 75
wax-ups
  Etkon abutment (Straumann), 93, 94–95
  Procera® technology, 88
  UCLA abutment, 66
  Whip Mix Vericore® system, 70
whiteSKY™ implant (Bredent), 135, 139, 141–142
  finish line, 168–170
  surfaces, 142, 145
  surgical protocol, 159–162, 164
yellow band
  cutting instrument for titanium, 123, 124
yttrium oxide
  zirconia stabilization, 74
Zimmer Dental, see also Screw-Vent® system
  abutments, 53, 70, 89
  Hex-Lock™ abutments, 51
  MTX™ surface, 134, 143, 144
  one-piece implant, 135, 139–140
  angulation, 170
  chamfer margins, 168
  surgical protocol, 149–152, 153
zirconia, 3t, 8–13, 14, 49, 136–138
  adjustment instruments (Vitality Laboratory), 125–129, 167
  adjustments, 122, 125–128
  intra-oral, 128–132
  burs to prepare, 166
  customized abutments, 20
  milling, 74–76
  one-piece implants, 135
  loading, 171
  provisional restorations, 171–172
  titanium vs, 147–148
  smoothing, 170
  soft tissue response, 169, 172
ZiReal® abutment, 50
Z-Systems Z-Look3 Evo® implant, 135, 139, 141
  angulation, 170
  finishing line, 168–170
  surfaces, 142, 145
  surgical protocol, 157–159, 160