

Index

Note: Large page ranges indicate main discussions. Page numbers followed by f indicate figures, t, tables.

A

- Age considerations
 - and cemented vs. cementless techniques, 99–100
 - in flexion contracture casting, 63
 - in tendon rupture, 154
 - in total knee arthroplasty (TKA), 42
- Alignment. *See* Anatomic alignment
- Allografts
 - for distal femur, 170–173
 - invagination of, 181f, 186
 - for patellar tendons, 164–167
 - illustrated, 165f, 166f, 167f
 - structural, 108t, 186
 - See also* Bone grafting
- Ambulation with flexion contracture, 57–59, 66
- AMK prosthesis (DePuy), 171t
- Amputation, 145
- Anatomic alignment
 - criteria for ideal, 25
 - patellofemoral, 27
 - prosthetic (general), 1, 7–13
 - restoration of normal, 86–88
 - in sagittal and coronal planes, 1
 - schools of thought on, 8
- Anatomic axis
 - illustrated, 9f
 - measurement of, 86–87
- Anderson Orthopaedic Research Institute (AORI) bone defect
 - classification system, 117–127
 - criteria of, 117–118
 - definition of deficit types, 119–120
 - femoral defects in, 120–127
 - tibial defects in, 127–131
 - “true lateral” radiographs for, 118–119
 - See also* Bone deficits/defects
- Anesthesia, serial casting under, 62–63
- Anterior cruciate ligament (ACL)
 - detachment of, 63–64, 65f
 - division of, 27
- Anterior midline approach, 27
- Anterior superior iliac spine, 18
- Antibiotics
 - as cement additives, 74
 - for infected prosthetic joints, 150–152
- AORI system. *See* Anderson Orthopaedic Research Institute (AORI) bone defect classification system
- Arthrofibrosis, 147t
- Arthrotomy
 - medial parapatellar, 27, 39, 43, 159
 - subvastus approach, 90, 159
- Attenuation studies, 52

- Augmentation
 blocks and wedges for bone, 134, 138, 150–151
 for fractures. *See* Fractures
 modular, 37, 111
 in patellar tendon repair, 163–164
 of quadriceps tendon, 154–155
 radiographic visibility of, 124–125, 131
See also Bone deficits/defects; Bone grafting
- Autografts, 81–82, 83f, 84f, 95–96
- Avulsion of tibial tubercle, 27, 39, 158–159
- B**
- Balancing of knee joints
 alignment concepts in, 7–13, 25, 86–88
 with flexion contracture. *See* Flexion contracture
 and posterior cruciate ligament, 88
 soft tissue's role in, 28–31
See also Extension gap; Flexion gap
- Barium-infused cements, 70
- Biceps femoris release, 48
- Biomet prosthesis, 171t
- Bleeding, 145, 147t
- Blocks. *See under* Instrumentation/appliances
- Blood vessels/circulation
 compromised vascular supply, 160
 inferomedial geniculate artery, 30f
 injury to, 67–68
- Bone augmentation. *See* Augmentation; Bone grafting
- Bone chips/slurry, 81–82, 83f, 84f, 95–96, 172
- Bone cuts. *See* Cutting/resection, bone
- Bone deficits/defects, 116–132
 augmentation/grafting for. *See* Bone grafting
 classification of
 AORI system of. *See* Anderson Orthopaedic Research Institute (AORI) bone defect classification system
 defect types in, 119–132, 122t
 history of, 116–117
 learning curve for, 132
 prerequisites for, 117–118
 radiography for, 118–119.
See also under specific defects
- femoral
 F1 defects, 120–121, 122t, 132
 F2 defects, 121–125, 122t, 132
 F3 defects, 122t, 125–127, 126t, 132
- patellar, 120
 in reimplantation, 151–152
 in revision TKA. *See* Revision total knee arthroplasty
 simple approach to, 108t
- tibial, 26f
 T1 defects, 122t, 127, 128f, 132
 T2 defects, 122t, 127–130, 129f, 132
 T3 defects, 122t, 130–132

- Bone grafting
 autografts, 81–82, 83f, 84f, 95–96
 followup studies on, 82
 for fractures. *See* Fractures
 intercalary grafts, 172
 preoperative anticipation of, 27
 radiographic visibility of, 124–125, 131
 in revision TKA. *See*
 Revision total knee
 arthroplasty
See also Allografts; Bone
 chips/slurry; Bone
 deficits/defects
- Bone loss
 augmentation for. *See*
 Augmentation; Bone
 deficits/defects; Bone
 grafting
 bone death at cement
 interface, 73
 causes of, 179
 from component removal,
 177, 179
 illustrated, 26f
 and revision TKA. *See*
 Revision total knee
 arthroplasty
See also specific bones
- Bone penetration of cement,
 72–73
- Bones/bone tissue
 anterior superior iliac spine,
 18
 cortical and cancellous, 81
 death at interface area, 73
 labelling of, 82–83
See also Femur; Patella;
 Tibia
- Braces/bracing, 155–156, 161,
 167, 187
- Bunnell suture weave, 161
- C**
- Cancellous bone screws, 85,
 125, 130
- Capsule, posterior, 63–65, 64f
- Casting
 after tendon repair, 156, 161
 for periprosthetic tibial
 fracture, 176
 postoperative, 66
 serial preoperative under
 anesthesia, 62–63
- Cementless total knee
 arthroplasty, 80–100
 alignment and kinetics in,
 86–88
 versus cemented, 77, 80, 96
 component design for,
 80–85
 history of, 7, 80
 outcomes of, 96–98
 PCL retention or
 substitution in, 88–89
 “porocoat” LCS, 54
 radiography of, 98–99
 surgical techniques for,
 90–96
 survivorship analysis of,
 96–97
- Cements/cementing, 70–77
 additives to, 70, 74, 150
 barium-infused, 70
 of bone fragments, 173
 versus cementless insertion,
 77, 80, 96
 centrifugation of, 71–72, 74
 exothermic reaction of,
 71–72, 150–151
 history of, 70
 of intramedullary rods, 173
 manufacturers of, 72
 monomers and polymers,
 70–71
 and patient age, 99–100
 penetration of, 72–73

- polymerization process in, 71–73
- polymethylmethacrylate. *See* Polymethylmethacrylate (PMMA)
- in revision TKA, 120, 122t, 125–127, 130, 186
- techniques for, 74–77
- temperature/viscosity studies on, 71–72
- See also specific components*
- Centrifugation of cement, 71–72, 74
- Cerclage wires/sutures, 161, 166
- Charnley, John, 70–71
- Circulation. *See* Blood vessels/circulation
- Cobalt chrome, 81
- Codivilla quadriceps tendon lengthening, 155–156
- Collateral ligaments
- avoidance of resection, 63–65
- medial. *See* Medial collateral ligament (MCL)
- in revision TKA, 111, 113, 115
- Complications. *See under specific procedures*
- Components
- alignment and kinetics in, 1, 7–11, 12f, 25, 86–88
- cementless. *See* Cementless total knee arthroplasty
- constrained condylar. *See* Constrained condylar prostheses
- design of
- biologic considerations in, 80–82
- geometry in, 82–85
- patellar component, 85
- downsizing of, 37, 38f, 172
- femoral. *See* Femoral component
- infection around. *See* Infection
- intercondylar distances of specific, 171t
- loosening of, 33, 52, 73, 75, 77, 127–131, 146t, 177
- migration/subsidence of, 121, 124–131, 182f
- patellar tendon impingement by, 160
- porous-coated, 80–82, 83f
- removal of, 171–172, 177, 179, 184. *See also* Revision TKA
- selection of, 42–43
- stemmed for revision, 124–125, 128, 130–131, 151–152, 178, 182
- tibial. *See* Tibial component
- trial components, 107–108
- See also* Knee systems/designs; *specific components*
- Condylar pegs, 75–76
- porous-coated, 80–82, 83f
- See also* Revision TKA
- Condyles
- defects in. *See* Bone deficits/defects
- least-diseased, 86
- osteophyte removal from, 30f, 34f, 63, 64f, 91, 95
- varus/valgus effects on, 8, 10–13
- Constrained condylar prostheses, 133–147
- avoidance of, 110
- choice of, 182, 184
- and genu valgum, 26
- indications for, 26, 49, 51

as standard for fractures, 172
 studies on, 42
 Continuous passive motion (CPM) machine, 49
 Contractures
 in flexion. *See* Flexion contracture
 postoperative, 49
 with valgus deformity, 41–54
 with varus deformity, 25–39
 See also Releases, soft tissue
 Coonse-Adams release, 159
 Coronal plane
 prosthetic alignment in, 1
 tibial cuts in, 14
 Cruciate limitation effect, 42
 Cruciate-retaining (CR)
 prostheses, 33, 36, 42, 67, 76
 Cuff formation, 39, 159
 Curettes, 63, 184
 Cutting/resection, bone
 block guides for, 33–34
 for cementless implants, 86–88
 “clean up cuts,” 184
 effects on gap size, 37, 38f
 equal to prosthetic replacement, 87
 instruments for. *See* under Instrumentation/appliances
 measured, 14, 63, 91–92
 of osteophytes. *See* Osteophytes
 over/under resection, 1, 2f, 36, 51
 power tools for, 15–18
 sharp dissection, 28–31
 studies on, 88
 thermal injury from, 91
 See also specific bones

D

Dacron tape, 156
 “Dead bone sandwich,” 185
 Debridement, 63, 184
 Defects, bone. *See* Bone deficits/defects
 Degrees of freedom, 133
 Designs. *See* Knee systems/designs
 Discharge goals after TKA, 50
 Disease processes and flexion contracture, 58, 62, 63
 See also specific diseases
 Dorr’s classification of bone defects, 116
 Double patella, 167f
 Drills, 92
 Drugs
 antibiotics. *See* Antibiotics for labelling bone, 82–83
 See also specific drugs
 Duracon prosthesis (Howmedica), 171t

E

Electrocautery, 17
 Epicondylar axis
 external rotation of, 111
 femoral, 4, 10f, 11f
 of femoral component, 9f, 11f
 as reference point, 33f, 37, 43–44, 54
 for rotational positioning, 4, 8–13
 Epicondyles
 axes of, 4, 9f, 10f, 11f, 111
 correlation between, 12
 deficits/defects in. *See* Bone deficits/defects
 definition and identification of, 33f, 37, 43–45
 exact center of, 20–21

- Exposure, surgical, 27–33
 quadriceps snip for, 39, 151, 159
 for tibial fracture revision, 179–180, 182
- Extension gap
 and component positioning, 11, 12f
 equal to flexion gap, 22, 35
 with flexion contracture, 59–61, 60f
 and posterior cruciate ligament, 88
 in revision TKA, 106t, 112–113, 114f
 significance of, 1–3, 4
 spacers for, 37, 150–151
 surgical expansion techniques, 63–66
 symmetry/asymmetry of, 46
- Extension of knee
 casting for, 62–63
 extension lag in, 155–156
 with flexion contracture. *See* Flexion contracture
 full active/full passive, 66–67
 intraoperative, 185
 stability/instability in, 51, 114f
 trial reduction on O.R. table, 95, 113f, 185
- External frames, 16f
- External rotation
 of femoral component, 4, 35, 37, 39, 43, 51–52, 86, 106t, 110–111
 reference points for, 8
 in revision TKA, 106t, 110–111
- F**
- Femoral component
 alignment of, 19–20, 45
 cement versus cementless, 72–73
 cementing of. *See under* Cements/cementing
 design of, 80–82
 downsized, 37, 38f, 172
 epicondylar axis of, 4, 9f, 11f, 111
 external rotation of, 4, 35, 37, 39, 43, 51–52, 86, 106t, 110–111
 internal rotation of, 13–14, 106t, 111
 lateralization of, 39
 loosening of, 33, 52, 73
 measuring for, 3–4, 5f
 migration and subsidence of, 121, 124–127
 polyethylene surface of, 81
 sizing of
 for primary TKA, 12f
 for revision TKA, 106t, 108, 109f
 valgus angle of, 4–13
See also Components;
specific procedures
- Femoral defects. *See under* Bone deficits/defects
- Femoral jigs
 intramedullary versus extramedullary, 19–20
 standard for, 23
- Femoral notching, 11, 34
- Femoral shaft axis, 9f
- Femur
 bone loss on. *See* Bone deficits/defects; Bone loss
 cutting/resection of, 13f, 18–21, 44–45, 66, 86–87
 entry hole position in, 20f
 fracture of, 140f, 143, 145, 146t
 revision for, 169–173
 modular augments for, 37, 111

- over/under-resection of, 1, 2f, 51
 sizing of, 33
- Femur periprosthetic fracture
 revision, 169–173
 challenges in, 169, 171
 hardware removal in, 171–172
 internal fixation techniques for, 170–173
 intramedullary rods for, 170, 172
 outcomes for, 173
- Fibula
 head for referencing, 17
 in revision TKA, 130
- Fixation
 bone screws for, 85, 125, 130, 166
 forces on internal, 170–173
 plates and screws for, 170, 172–173, 185
 rods for. *See* Intramedullary rods
 with suture, 161
- Flexion contracture, 57–68
 complications of, 67
 and diseases, 57–58, 62–63
 illustrated, 58f, 61f
 outcomes for, 67–68
 overview of, 57–59
 PCL resection for, 95
 postoperative management of, 66–67
 preoperative evaluation of, 59–63
 radiography of, 59, 61–62
 recurrence of, 66
 residual, 67–68
 surgical techniques for, 34, 63–66
- Flexion gap
 and component positioning, 8, 12f
 equal to extension gap, 22, 35
 with flexion contracture, 59–61, 60f
 and posterior cruciate ligament, 88
 in revision TKA, 106t, 110, 114f
 significance of, 3, 4
 spacers for, 37, 150–151
 symmetry/asymmetry of, 1, 5, 36–37, 46, 51
- Flexion of knee
 in revision TKA, 106t, 108–112, 114f
 stability in. *See* Stability/instability
See also Flexion contracture
- Fractures
 differentiation of, 175, 184–185
 intercondylar, 173
 nonunions, malunions, and delayed unions of, 178, 186–187
 patellar, 145, 146t
 radiography of, 180f
 stress fractures versus trauma, 175
 supracondylar, 11, 140f, 143, 145, 146t
 revision for, 169–173
 tibial, 145, 146t
 revision for, 175–188
- G**
- Gap size. *See* Extension gap; Flexion gap
- Gastrocnemius muscle
 exposure of, 46
 release of, 34, 48, 63, 65f, 66
- Genesis prosthesis (Richards), 171t

- Geniculate artery, 30f
 Genu valgum, 26, 45, 53
 Genu varum, 26f
 Gracilis tendon, 163
 GUEPAR hinge, 70, 110, 126–127
- Guides
 for cutting/resecting, 15–18, 16f, 22f, 33f, 34, 91
 illustrated, 167f
 intramedullary, 19–21
- H**
- Hemarthroses, 145
 Hemostasis, 171
 bleeding complications, 145, 147t
 electrocautery for, 17
- Hinged knee systems, 54, 70, 110, 126–127, 133–137, 140–142
See also specific systems
- Hohmann retractors, 28–30, 31f
- HSS (Hospital for Special Surgery) knee score, 97, 141–143
- Humidity in O.R., 71–72
- I**
- Iatrogenic issues, 160, 176
- Iliotibial band, 45–46, 48f
- Iliotibial tract “piecrust” release, 48, 159
- Implants. *See* Components; Knee systems/designs; Prostheses, knee
- Incisions
 anterior midline approach, 27
 complications with, 147t
 for femur fractures, 171
 lateral approach, 54
 length of, 39
 medial parapatellar approach, 27, 39, 43, 159
 in revision TKA, 184
 subvastus approach, 90, 159
- Infection
 antibiotics for, 150–152
 component removal with, 76, 150
 and flexion contracture, 57
 in revision failures, 145–147
 staged reimplantation for, 150–152
- Inferomedial geniculate artery, 30f
- Inflammation in flexion contracture, 57
- Insall-Burstein prosthesis (Zimmer), 171t
- Insall, John, 104, 116–117, 152, 158–159
- Insall’s classification of bone defects, 116–117
- Instability. *See* Stability/instability
- Instrumentation/appliances
 for clamping
 bone clamp, 173
 tenaculum, 39
 for cutting/resecting
 drills, 92
 guides, blocks, and slots, 15–20, 16f, 22f, 33f, 34, 91
 osteotomes, 28–31, 34, 63
 periosteal elevators, 28–31, 63
 reamers, 6, 21, 95–96, 105, 165–166, 185
 sawblades. *See* Sawblades
 for debridement
 currettes, 63, 184
 for femoral preparation, 18–20

- for fixation
 - bicortical screws, 166
 - cancellous bone screws, 85, 125, 130
 - pins, 163
 - plate and screw devices, 170, 172–173, 185
 - rods. *See* Intramedullary rods
 - wires, 171t
- history of, 7, 15–16
- jigs, 19–20, 23
- power tools. *See* Power tools
- for retracting
 - Hohmann retractors, 28–30, 31f
 - laminar spreaders, 31, 32f, 43, 46, 54
 - tensors, 21–22, 54
 - for tibial preparation, 17–18
- See also* Components; Knee systems/designs; Prostheses, knee
- Intercalary grafts, 172
- Intermedics prosthesis, 171t
- Internal rotation
 - avoidance of, 4, 35, 37, 39
 - of femoral component, 13–14, 106t, 111
 - and patellar tracking, 13–14
 - in revision TKA, 106t, 111, 172
 - and sagittal plane, 170
- Intramedullary canal
 - as reference point, 11
 - rod centering in, 86, 151
 - size/diameter of, 19, 105
- Intramedullary rods
 - antibiotic-impregnated, 151
 - cementing of, 86, 173
 - centering of, 86, 151
 - for femur fracture, 170–173
 - placement of, 19
 - press-fitting of, 181f, 185
 - for revision TKA, 106–107
 - size of, 12
- Irrigation for cooling, 91, 150–151
- J**
- Jigs, 19–20, 23
- Joint lines
 - definition and identification of, 112–113
 - in revision TKA, 122t, 123–124
- K**
- Kelikian technique of patellar tendon repair, 162–163
- Kinematic rotating hinge
 - characteristics of, 54, 110, 126–127, 134
 - illustrated, 136f, 140f
 - outcomes with, 141–142
- Kinematics, knee, 86–90
- Kirschner wires, 171t
- Knee immobilizers, 49
- Knee joints, biological
 - degrees of freedom in, 133
 - manipulation of, 66–67
 - normal alignment of, 41, 54, 86–88
 - physical examination of, 26
 - varus versus valgus, 18–21 and joint rotation, 10f, 11f
- Knee Society Scores, 67–68
- Knee systems/designs, 133–147
 - AMK prosthesis (DePuy), 171t
 - Biomet prosthesis, 171t
 - cementless. *See* Cementless total knee arthroplasty
 - constrained condylar. *See* Constrained condylar prostheses

- cruciate-retaining (CR), 33, 36, 42, 67, 76
 customized, 134
 Genesis prosthesis (Richards), 171t
 GUEPAR hinge, 70, 110, 126–127
 intercondylar distances of specific, 171t
 kinematic. *See* Kinematic rotating hinge
 low-contact stress (LCS) mobile-bearing, 54
 MacIntosh interpositional, 70
 Miller-Galante prosthesis (Zimmer), 171t
 Natural Knee, 85f, 97
 Noiles knee prosthesis, 134, 137f
 PCL substituting, 88
 “porocoat” LCS, 54
 posterior-stabilized, 76, 142, 152, 164
 PROSTALAC, 151
 Total Condylar III, 66, 134, 135f, 142–143
 Tricon-M, 96
 variations in, 14
See also Prostheses, knee
- L**
- Lamellar spreaders, 31, 32f, 43, 46, 54
 Landmarks. *See* Reference points/landmarks
 Lateral approach incision, 54
 Lateral releases. *See under* Valgus deformity
 Lateral retinacular release, 52, 90, 154, 159
 Lateralization of components, 35, 39
 Leg length, 172
- Ligaments
 balancing of. *See* Balancing of knee joints
 releases of
 sequential, 1, 5, 47t, 63–65
 types of, 3, 52
 for valgus deformity. *See* Valgus deformity
 for varus deformity. *See* Varus deformity
See also Extension gap; Flexion gap; Releases; *specific ligaments*
- Limb length, 172
 Loosening of components. *See specific components*
- Low-contact stress (LCS) mobile-bearing prostheses, 54
- M**
- MacIntosh interpositional, 70
 Manipulation of knee joint, 66–67
 Manufacturers
 of cements, 72
 of knee systems, 134–136, 171t
See also specific prostheses
- Mechanical axis
 forces on internal fixation, 170
 illustration of, 9f
 measurement of, 86–87
 restoration of, 179
 schools of thought on, 8
- Medial collateral ligament (MCL)
 attenuation studies on, 52
 contractures of, 25–28
 defective in revision TKA, 113, 115
 illustrated, 28f, 30f
 inadvertant division of, 37

- protection for, 45
 release of, 28–31
 superficial, 44f
 varus deformity elongation
 of, 25–27
See also Releases
- Medial epicondylar ridge, 44f
 Medial parapatellar approach,
 27, 39, 43, 159
 Medial releases. *See under*
 Varus deformity
 Medialization of patella, 39,
 89–90, 92–94
 Medullary canal. *See*
 Intramedullary canal
 Medullary stems. *See* Pegs and
 stems
 Meniscus, lateral, 27
 Mersilene tape, 173
 Metaphyseal region, 119–120
 deformity in, 179. *See also*
 Valgus deformity; Varus
 deformity
 fractures in. *See* Fractures
 illustrated, 118f
 Methylmethacrylate. *See*
 Polymethylmethacrylate
 (PMMA)
 Migration/subsidence of
 components, 121,
 124–131, 182f
 Miller-Galante prosthesis
 (Zimmer), 171t
 Modulus differential, 74
 Monomers and polymers,
 70–71
 Muscles. *See specific muscles*
- N**
- Natural Knee, 85f, 97
 Neurologic deficits/
 complications
 peroneal nerve palsy. *See*
 Peroneal nerve palsy
- from vascular injury, 67–68
 vascular injury, 160
 Noiles knee prosthesis
 characteristics of, 134
 illustrated, 137f
 Nonunions, malunions, and
 delayed unions, 186–187
- O**
- Osteoarthritis, 58f, 67, 81, 98f
 Osteolysis
 in F2 and F3 defects, 121,
 123–131
 radiography of, 180f
See also Bone deficits/defects
 Osteonics prosthesis, 171t
 Osteophytes
 flexion contracture-related,
 57–59, 58f
 lateral versus medial, 43
 osteotomes for, 34f, 63, 95
 removal of, 30f, 63, 64f, 91
 in varus deformity, 27
 Osteoporosis, 76, 85
 Osteotomes
 for component removal, 184
 curved, 34, 95
 for medial release, 28–31
 for osteophyte removal, 34f,
 63, 95
 Osteotomy indications,
 179–180, 182
- P**
- Patella
 defects in, 120
 double, on radiography, 167f
 eversion and dislocation of,
 27, 90–91
 fractures of, 145, 146t
 instability of, 35, 37, 39,
 51–52
 medialization of, 39, 89–90,
 92–94

- radiographic tracking of, 26, 94f
 - as reference point, 112
 - resurfacing/reaming of, 6, 15, 21, 95–96, 105, 165–166, 185
 - in revision complications, 143, 145, 146f
 - thickness of, 15, 92, 98f
 - tracking of. *See* Patellar tracking
- Patellar component
- alignment of, 14
 - cementing of, 75–76
 - design of, 85
 - medialization of, 39, 89–90, 92–94
 - positioning of, 6
 - sizing of, 92
 - stability of, 51–52, 87–88
 - thickness of, 85f, 98f
- Patellar tendon
- detachment of, 27
 - disruptions of, 158–168
 - allografts for, 164–167
 - characteristics of, 160
 - outcomes for, 168
 - physical therapy/rehab for, 161–162, 164, 167
 - repair techniques for, 161–168
 - risk factors for, 158
 - with tibial tubercle avulsion, 158–159
 - forces in, 154
 - impingement of, 160
 - rupture of, 39, 154, 160f
- Patellar tracking
- causes of maltracking, 89–90
 - and femoral component alignment, 26, 51–52
 - intraoperatively, 39
 - and valgus deformity, 42
- Patellofemoral articulation
- forces in, 8, 14–15
 - stability in, 87–88
- Patient selection, 81
- PCL. *See* Posterior cruciate ligament (PCL)
- Pegs and stems
- on cement spacers, 151
 - condylar pegs, 75–76
 - medullary stems, 110
 - offset stems, 183f
 - porous-coated, 80–82, 83f
 - for revision TKA, 124–125, 128, 130–131, 151–152, 178, 182
 - smooth, 82, 85
 - See also specific components and procedures*
- Periosteal elevators
- for capsule elevation, 63
 - for medial release, 28–31
- Periosteum
- cuff formation of, 39, 159
 - sharp dissection of, 28–31
- Periprosthetic fractures. *See* Fractures; *specific bones*
- Peroneal nerve palsy
- decompression outcomes for, 51
 - with flexion contracture, 67
 - incidence of, 147t
 - from lateral releases, 50
 - natural resolution of, 50, 54
- Pes anserinus tendon
- detachment of, 27
 - illustrated, 28f, 30f
- Pes bursitis, 92
- PFC prosthesis (Johnson & Johnson), 171t
- Physical examinations, 26
- Physical therapy/rehab. *See* *under specific procedures*
- “Piecrust” release, 46, 48

- Plate and screw devices, 170, 172–173, 185
- Plumb lines, 31
- Polyethylene, 14, 81, 89f, 112–113
- Polymerization process, 71–73
- Polymethylmethacrylate (PMMA)
 application techniques for, 74–77
 versus cementless insertion, 77
 development of, 70, 73–74
 history of, 7
 polymerization process, 71–73
See also Cements/cementing
- Popliteus tendon preservation, 48
- “Porocoat” LCS components, 54
- Porous coating (PC), 81–82, 83f
- Posterior condylar angle, 44–45
- Posterior cruciate ligament (PCL)
 in cementless techniques, 88–89
 detachment of, 63–64, 65f
 in flexion contracture, 95
 retention of, 33, 36, 91
 versus sacrifice of, 42, 88
 substitution for, 26, 88
See also Releases
- Posterior slope, 88
- Posterior-stabilized knee
 systems/designs, 76, 142, 152, 164
- Postoperative management.
See specific procedures
- Power tools
 for component removal, 184
 for cutting/resecting, 15–18
 thermal injury from, 73, 91
- Preoperative planning. *See specific procedures*
- Press-fitting, 181, 185
- Pressurization techniques, 75
- PROSTALAC (prosthesis of antibiotic-loaded acrylic cement), 151
- Prostheses, knee
 alignment/angle of, 7–13
 balance of. *See* Balancing of knee joints
 constrained condylar. *See* Constrained condylar prostheses
 cruciate-retaining (CR), 33, 36, 42, 67, 76
 design history of, 7
 early failures of, 70
 Insall-Burstein prosthesis (Zimmer), 171t
 intercondylar distances of specific, 171t
 loosening of, 33, 52, 73, 75, 77, 127–131, 146t, 177
 patellar tendon impingement by, 160
 posterior-stabilized, 76, 142, 152, 164
 removal of, 171–172. *See also* Revision TKA
 stemmed for revision, 124–125, 130–131, 138, 151–152, 178
See also Knee systems/designs; *specific components*
- Prosthetic notch “plasty,” 170
- Q**
- Quadriceps muscle
 in flexion contracture, 57
 patellar expansion of, 27
 quadriceps snip, 39, 151, 159

turndown technique, 159
 V-Y quadricepasty, 39
 Quadriceps snip, 39, 151, 159
 Quadriceps tendon
 repair and augmentation of,
 155–156
 rupture of, 154

R

Radiography

barium-infused cement for,
 70
 of bone defects. *See under*
 Bone deficits/defects
 double patella on, 167f
 of femur fracture, 140f
 with flexion contracture, 59,
 61–62
 misleading results of, 59,
 61–62
 of offset stem, 183f
 of osteolysis, 180f
 of patellar tendon allograft,
 167f
 of patellar tendon rupture,
 160f
 postoperative cementless,
 98f, 99f
 postoperative patellar, 26,
 94f
 preoperative, 18, 26, 93f, 98f,
 99f, 105, 179
 of revision TKA, 114f,
 179–180, 182
 subsidence on, 182f
 “true lateral” views in,
 118–119
 Rand’s classification of bone
 defects, 117
See also Bone deficits/defects
 Range of motion, 167, 185
 Reamers/reaming, 6, 21, 95–96,
 105, 165–166, 185
 Rectus muscle, 39

Recurvatum, 112–113

Reference points/landmarks

for bone defects, 119
 epicondylar axis as, 33f, 37,
 43–44, 54
 for femoral
 alignment/rotation, 7–14,
 110–111
 for femur sizing, 5f
 fibular head as, 17
 intramedullary canal/rods as,
 11–12, 19–20
 least-diseased, 86
 patella as, 112
 of tibial plateau, 54
 Rehabilitation. *See under*
specific procedures

Reimplantation, staged,

150–152
 outcomes of, 152
 phases of, 150
 spacer blocks for, 150–151
See also Revision total knee
 arthroplasty

Releases, soft tissue

Coonse-Adams release, 159
 history of, 1–3, 2t, 35
 instruments for, 28–31
 lateral, 41–54
 medial, 25–39
 over-release, 1, 2f, 36, 51, 54,
 147t
 peroneal nerve palsy from,
 50–51, 67
 “piecrust” type of, 46, 48,
 159
See also Balancing of knee
 joints; *specific structures*
and deformities

Revision total knee

arthroplasty
 bone defects in. *See* Bone
 deficits/defects
 challenges in, 104–105, 115

- constrained systems for,
133–147. *See also specific system names*
- complications in, 143,
145–147
- history of, 133
- illustrated, 135–141
- implant designs of,
133–138
- indications for, 138–141,
143, 145–147
- outcomes of, 141–143,
144t
- with femur fracture. *See*
Femur periprosthetic
fracture revision
- multiple, 124, 143
- pegs and stems for. *See* Pegs
and stems
- preoperative radiography for,
179–180, 182
- three-step technique for,
104–115
- extension stabilization in,
106t, 112–113, 114f
- flexion stabilization in,
106t, 108–112, 114f
- soft tissue balance in, 113,
115
- tibial platform
- establishment in,
105–108, 106t, 107f
- with tibial fracture. *See*
Tibial periprosthetic
fracture revision
- Rheumatoid arthritis (RA)
- and cementless components,
81
- and extension in TKA, 76
- with flexion contracture, 62,
67–68
- illustrated, 58f
- smooth central stems for, 82,
85
- Robotic arms, 17
- Rods. *See* Intramedullary rods
- Rotation
- of epicondylar axis, 4, 8–13,
111
- excessive, 35
- external. *See* External
rotation
- internal. *See* Internal
rotation
- positioning for, 4
- reference points for, 7–14,
110–111
- rotational torque, 14
- stability/instability in, 186
- varus and valgus effects on,
10f, 11f
- See also specific components
and procedures*
- Rush rods, 170
- S**
- Sagittal plane
- forces on internal fixation,
170
- prosthetic alignment in, 1
- tibial cuts in, 14
- Sawblades
- cutting blocks for, 17–18
- irrigation of, 91, 150–151
- rotating versus oscillating,
16
- thermal injury from, 73, 91
- wobbling of, 21
- Screws, 85, 92, 125, 130, 166
- Scuderi technique of tendon
repair, 155–156
- Semimembranosus muscle
- fluid, 29, 31
- Semimembranous tendon, 31f
- Semitendinosus tendon,
162–163
- Sepsis, 145
- Simplex cement, 75

- Skin expanders, 165
- Slots. *See under*
Instrumentation
- Soft tissue, 28–31
balancing of. *See* Balancing
of knee joints
challenges in revision TKA,
104–105, 115
contraction of. *See*
Contractures
expanders for, 165
over-release of, 1, 2f, 36, 51
release of, 1–3, 2t, 35. *See*
also Releases, soft tissue
- Spacers for flexion/extension
gaps, 37, 150–151
- Stability/instability
anteroposterior, 3
assessment of, 36
in flexion and extension, 51,
113f, 114f
of patella, 35, 37, 39
of patellar component,
51–52, 87–88
rotational. *See* Rotation
symmetric or asymmetric,
36–37, 51
in valgus deformity, 41
varus-valgus, 36, 106t
See also specific components
- Staging/staged procedures,
150–152, 177
- Steinmann pins, 163
- Stems. *See* Pegs and stems
- Stress fractures, 175
- Structural allograft, 108t, 186
- Subperiosteal dissection,
29–31
- Subsidence. *See*
Migration/subsidence of
components
- Subvastus approach, 90, 159
- Sulcus, definition and
identification of, 44–45
- Supracondylar fractures. *See*
under Fractures
- Surgeons
preferences of
in cements/cementing, 72,
76
for sequence of releases,
47t
“surgeon’s eye,” 7
- Surgical technique
as central to outcome, 1
improper, 160, 176
See also specific procedures
- Suture fixation, 161
- Symmetry/asymmetry of
flexion space, 1, 5,
36–37, 46, 51
- Synovium, 27
- T**
- Temperature
and cement viscosity, 71–72
in polymerization process,
71–72, 150–151
thermal injury from
sawblades, 73, 91
- Tendons. *See specific tendons*
- Tensors, 21–22, 54
- Tetracycline labelling, 82–83
- Thermal injury, 73, 91
- Tibia
bone loss on, 26f, 122–132
cutting/resection of, 13f, 14,
17–18, 45, 86, 88, 159
exposure of, 27
fractures of. *See* Tibial
periprosthetic fracture
revision
normal posterior slope of,
34, 88
over/under-resection of, 1,
2f
as reference point, 54
sizing of, 92

- Tibial component
 alignment of, 13f, 14, 17–18, 52
 cementing of. *See under* Cements/cementing
 design of, 82–85
 internal rotation of, 37, 39
 lateralization of, 35
 loosening of, 75, 77, 127–131, 177
 measuring for, 5
 migration and subsidence of, 127–131, 182f
 polyethylene surface of, 14
- Tibial defects. *See under* Bone deficits/defects
- Tibial jigs, 23
- Tibial periprosthetic fracture
 revision, 175–188
 allografts for, 186
 exposure for, 179–180, 182
 history of, 175–176
 incidence of, 176
 operative techniques for, 184–187
 outcomes of, 187
 physical therapy/rehab for, 187
 preoperative planning for, 179–184, 188
 staged, 177
 treatment options for, 176–178
- Tibial plateau
 bone loss on, 26f, 122–132
 exposure of, 27
 with flexion contracture, 61–62
 fracture of medial, 175
 least-diseased portion of, 86
 medial subsidence on, 182f
 as reference point, 54
 slope of, 34, 88
- Tibial platform rebuilding, 105–108, 107f
See also Augmentation
- Tibial trays, 76, 92
- Tibial tubercle
 avulsion of, 27, 39, 158–159
 transfer of, 53
 wedge resection of, 159
- Tibiofemoral alignment/angle, 8, 52
- Titanium, 81, 85
- TKA. *See* Total knee arthroplasty (TKA)
- Tobramycin, 150
- Total condylar III system
 characteristics of, 134
 high central spike on, 66
 illustrated, 135f
 outcomes with, 142–143
- Total knee arthroplasty (TKA)
 age and. *See* Age considerations
 basic principles of, 1–6, 2t
 cementless. *See* Cementless total knee arthroplasty cements in. *See* Cements/cementing
 constraint in primary, 145
 early failures of, 70
 flexion contracture in. *See* Flexion contracture
 with fractures. *See* Fractures
 goals of, 1, 2f, 54
 infection in. *See* Infection
 neurologic complications in, 50–51, 54
 patellar tendon disruptions in. *See under* Patellar tendon
 reimplantation, staged, 150–152
 revision of. *See* Revision total knee arthroplasty
 three bone cuts in, 1, 2f

- with valgus. *See* Valgus deformity
 - with varus. *See* Varus deformity
 - Tourniquets, 76, 171
 - Traction, skeletal
 - after tendon repair, 163
 - for flexion contracture, 62–63
 - Trial components, 107–108
 - Tricon-M prostheses, 96
 - Trochlear grooves, 82, 87
 - “True lateral” views, 118–119
 - Turnbuckle extenders, 62
 - Turndown technique, 159
 - Type 1 defects (intact metaphyseal bone), 119–121, 122t
 - Type 2 defects (damaged metaphyseal bone), 119, 121–125, 122t
 - Type 3 defects (deficient metaphyseal segment), 120, 122t, 125–127, 126f
- V**
- V-Y quadriceplasty, 39
 - Vacuum environments, 71–72
 - Valgus angle/alignment
 - of femoral component, 1, 4–13, 45
 - femur cuts for, 33
 - for ideal outcome, 25
 - Valgus deformity
 - effects on femoral condyles, 8, 10–13
 - femoral cuts with, 8
 - implant selection in, 42–43
 - lateral release for, 41–54
 - bone cuts in, 43–45
 - bone grafting in, 53
 - complications of, 50–52
 - follow-up studies on, 52–54
 - illustrated, 48f, 49f
 - outcomes of, 52–54
 - peroneal nerve palsy after, 50–51, 54, 67, 147t
 - “piecrust” type of, 46, 48, 159
 - postoperative management of, 49–50
 - soft tissue in, 45–49
 - surgeon’s sequential preferences in, 47t
 - and patellar tracking, 42
 - pathophysiology of, 41, 54
 - PCL resection for, 95
 - posterior condylar angle in, 44–45
 - prevalence of, 41
 - sequential correction of, 1, 5, 47t
 - Vancomycin, 150
 - Varus deformity
 - complications of correction, 36–39
 - effects on femoral condyles, 8, 10–13
 - femoral cuts with, 8
 - illustrated, 26f
 - ligament release indications for, 3, 95
 - medial release for, 25–39
 - complications of, 36–39
 - intraoperative assessment of, 33–35
 - outcomes of, 36–39
 - preoperative planning in, 25
 - techniques for, 25–35
 - prevalence of, 41
 - Vascular supply, 30f, 67–68, 160
 - Vastus medialis muscle
 - illustrated, 28f
 - subvastus approach, 90, 159

Viscosity of cement, 71–72

Vision, 88

W

Walking/gait, 57–59, 66

Wedge resection of tibia, 159

Weight-bearing

full, 50

touch, 187

X

X-rays. *See* Radiography