

INDEX

Note: OA stands for osteoarthritis.

Page numbers in *italics* indicate figures.

Page numbers followed by a “t” indicate tables.

CP stands for color plates, located between pages 96 and 97.

- ACE inhibitors, 185t
- Acetaminophen (ACET), 147-170, 289-297
 - action mechanism, 151-153, 152
 - administered into spinal cord and/or brain, 151-153, 152
 - adverse effects, 155-162
 - hepatotoxicity, 155-158
 - alcohol and, 155, 157-158
 - hypertension, 153
 - renal disease, 158-160
 - upper GI ulcers/bleeding, 160-162, 160
 - alcohol and, 155
 - aspirin complication rate, vs ACET, 159-160, 161
 - aspirin pharmacodynamics and, 163, 188
 - aspirin with, 189
 - codeine with, 245
 - COX inhibition by, 151
 - CV disease and hypertension and, 153, 163-164
 - diclofenac vs, 148, 172, 290
 - dosage of, 147-149, 289, 290-291
 - efficacy
 - dose-dependency of, 149, 291
 - for inflammation, 149-150, 289
 - for OA pain, 147-149, 150-151, 289-291, 290t
 - FDA concerns on, 164-165, 245, 247
 - metabolism of, 153-155, 154
 - for NSAID withdrawal, 191
 - NSAIDs vs
 - for inflammation, 149-150
 - for pain, 147-148, 150-151, 289-290, 290t
 - safety and cost, 149
 - structure modifying effects, 307-308
 - NSAIDs with, 156, 173, 291, 292
 - opioid-ACET combination drugs, 156, 164-165
 - overdose of, 155, 164
 - pharmacokinetics of, 153-155, 154
 - phenylbutazone vs, 149
 - prostaglandin synthesis inhibited by, 161
 - recommendations for use, 147, 150-151
 - to augment NSAID treatment, 156, 173, 291, 292
 - as initial therapy, 149, 150-151, 156, 289, 291-292
 - safety of, 147, 148-149
 - structure modifying effects of, 307-308
 - thromboxane B₂ inhibition by, 163
 - warfarin interaction with, 162-163

Acid suppression, 176-178

Acromegaly, 21t

Acromioclavicular OA, 20t, 94t

Acupuncture, 139-140

ADAPT (Alzheimer's Disease Anti-Inflammatory Prevention Trial), 220t, 225, 226-227

Adenoma Prevention with Celecoxib (APC), 220t, 225, 226

Adenomatous Polyp Prevention on Vioxx (APPROVe), 220t, 222, 232

Adenomatous polyps, prevention of

- APC study, 220t, 222, 225, 226
- APPROVe study, 220t, 222, 232
- PreSAP study, 220t, 225, 226

Aerobic exercise, 119-122

- examples of, 122

Age/aging, 29

- bone density and, 37
- OA and, 27-30, 28, 38, 39t, 99
- total arthroplasty and, 321, 322

Aggrecan, cartilage breakdown and, 55

Aggrecanase gene, 16, 55

Alanine aminotransferase, 149

Alcohol

- acetaminophen toxicity and, 153, 157-158
- NSAID-induced peptic ulcer and, 175

Alkaptonuria, 21t, 22

Alpha, adrenergic, peripheral, 185t

Alpha₂ agonist, central, 185t

Alzheimer's disease

- celecoxib in, 224-227
- COX-2 inhibition and, 220t, 225
- naproxen in, 226-227

Alzheimer's Disease Anti-Inflammatory Prevention Trial (ADAPT), 220t, 225, 226-227

Ambulatory assistive devices, 128-130

American Academy of Orthopaedic Surgeons, guidelines, 272

American College of Gastroenterology GI Bleeding Registry, 161

American College of Rheumatology (ACR)

- OA classification criteria, 23
- OA management guidelines, 150

American Geriatric Society, OA guidelines, 151

Aminotransferase levels, acetaminophen and, 148, 149, 153

Androstane receptor, constitutive (CAR), 155

Angina of bone, 83-84

Angiotensin II blockers, 185t

Animal models of OA, 30, 48, 57-58, 307, 309, 311, 312

Ankle

- involvement of, with OA of other joints, 128
- OA of, 30, 58, 79
- joint distraction in, 68
- range of motion in, 128
- trimalleolar fracture and, 30

Ankle (*continued*)

- range of motion requirements for locomotion, 129t
- strengthening exercise for, 125

Anserine bursitis

- differential diagnosis of, 94, 95
- knee OA and, 86

Anterior cruciate ligament, canine OA model, 30, 48, 57-58, 307, 309, 312

Anterior cruciate ligament injury, 30, 32, 48, 54

Anticoagulants, acetaminophen interaction with, 162-163

Antihypertensive drugs, NSAID effects on, 182-185, 185t, 187

Anti-inflammatory agents, acetaminophen vs NSAIDs as, 147

Antinuclear antibodies, 99, 101t

Antioxidants, 38-39

Antiplatelet Trialists Collaboration, 176

Apatite arthropathy, 21t

Apatite crystals, CP7.4, 107. See also *Calcium hydroxyapatite crystals*.

APC (Adenoma Prevention with Celecoxib), 220t, 225, 226

Apophyseal joints, OA of, 20t, 93, 94t

APPROVe (Adenomatous Polyp Prevention on Vioxx), 220t, 222, 232

Arthritis, Rheumatism, and Aging Medical Information System, 174

Arthritis, rheumatoid. See *Rheumatoid arthritis*.

Arthrocentesis, 97

Arthropathy, neuropathic. See *Charcot's joint*.

Arthroplasty, 321-324, 323t

- age at, 321, 322
- complications of, 322
- deep vein thrombosis risk after, 322
- infections after, 322
- osteotomy vs, 325
- pain relief after, 321, 323
- for painful OA, 68-69
- revision rate after, 321, 322
- timing of surgery, 321-322
- total hip (THA), 321
- total joint (TJA), 321
- complications of, 322
- incidence rate for, 321, 323

total knee (TKA), 321-323

- benefits of, 323, 326t-327t
- complications of, 322
- factors influencing "gatekeeper's" decision on, 323-324, 323t
- incidence/frequency of, 321
- physical function and pain after, 326t-327t

Arthroscopic surgery, 319

Arthrotec (diclofenac/misoprostol), 150, 290

Articular cartilage. See *Cartilage, articular*.

Artzal, 273, 280

Aspartate aminotransferase, 149

Aspirin. See also *NSAIDs*.

- acetaminophen and, 163, 188

- Aspirin (*continued*)
 antiplatelet effect of, 176, 188
 ibuprofen inhibition of, CP11.2, 188-191
 for arthroplasty, 322
 celecoxib and, 176, 299
 on CLASS, 176
 COX inhibition by, 179t
 GI effects of, 175-176, 177, 178
 NSAID use with, 175-177, 177, 291, 293t, 295
 gastroprotector prescription with, 293t, 295
 interactions, and antiplatelet effect, 188-191
 side effects of
 gastrointestinal, 175-177, 177, 178
 renal, 158-160
 for stroke and cardiovascular event prevention, 293t, 295
 structure modifying effects of, 307
 thromboxane inhibition by, 176, 228
 blocked by ibuprofen, 188
 warfarin and, 175
 Assistive devices, for locomotion, 128-130, 289
 Asymptomatic OA, 19t, 53
 Athletics, OA and, 32
 Australian/Canadian Osteoarthritis Hand Index (AUSCAN), 195
 Autoimmune diseases, 99
 Autologous chondrocyte transplantation, 324
 Autologous osteochondral plugs, 324
 Avascular necrosis, 21t, 95, 97
 Azapropazone, 308
 AZD3582. See *Naproxcinod*.
- Bacterial infection
 after arthroplasty, 322
 in joints, CP7.6, 97, 107
 Baker's cyst. See *Popliteal (Baker's) cyst*.
 Bandaging, elastic, for knee OA, 134, 136-137
 Beta-Adrenergic blockers, 185t
 Bleeding, GI. See *Gastroenteropathy; Gastrointestinal effects*.
 Body mass index (BMI), 33, 39
 Bone
 angina of, 83-84
 osteotomy for pain relief and functional improvement, 68, 69
 remodeling/hypertrophy in OA, CP3.2, CP4.4, 49-51, 51, 67
 subchondral
 in OA etiopathogenesis, CP4.3, 65-67, 66
 in protecting joint from stress, 59-61
 stiffening of, 65
 thickening of, CP3.4
 viscoelasticity of, 59-61
 Bone cysts, CP3.2, 49-50, 51
 Bone density, 37
 Bone fragments, in synovium, CP3.6, 51
 Bone marrow, edema in, 40
 Bone marrow lesions (BMLs), 84-85
 Bone spur. See *Osteophytes*.
 Bouchard's nodes, 20t, 83
 lidocaine patches for, 261
 physical examination of, 87, 102
 Braces, for knees, 134
 Bunion, CP5.1, 88
 Bursitis, 86
- C-reactive protein (CRP), 99, 101t
 Caisson disease, 21t
 Calcium deposition diseases, 21t
 Calcium hydroxyapatite crystals, 85
 in synovial fluid, CP7.4, 107
 Calcium pyrophosphate dihydrate crystals, 21t, 85
 in menisci and cartilage, 99, 101
 in synovial fluid, CP7.3, 107
 Canadian Coordinating Office of Health Technology Assessment (CCOHTA), 232-233
 Canes, 126, 128-130, 289
 proper fitting and use of, 128
 Canine cruciate-deficiency model of OA, 30, 48, 57-58, 307, 309, 312
 Capsaicin cream, 259-263
 action mechanisms of, 259-260
 cautions with, 260-261
 dosage of, 259, 260
 efficacy of, 259, 260
 Capsaicins, effectiveness of, 193
 Cardiovascular events
 acetaminophen and, 163-164
 aspirin prevention of, 295
 aspirin, prophylactic prescription for, 295
 celebrex and, 225-226
 on CLASS trial, 225
 NSAIDs and, 182-187, 185t
 as prescribing consideration, 294-295
 Carpal OA, 20t, 83
 Carpal tunnel syndrome, 102
 Cartilage
 articular
 damage, not stopped by synovitis reduction, 300
 healing and remodeling, 55-56
 hypertrophic repair of, 47, 48, 49
 load-bearing areas of, 24
 tears and fibrillation of, CP3.3, CP4.1, 47-48, 56
 thickening in early OA, 47, 48, 49
 tidemark reduplication in, 49, 50
 viscoelasticity of, 59-61

- Cartilage (*continued*)
- breakdown of. See also *Etiopathogenesis of OA*.
 - aggrecan loss in, 55
 - interleukin-1 in, 55, 56
 - matrix metalloproteinases in, 55, 56
 - mechanical stress in, 57-59
 - nonprogressive, 24
 - NSAIDs and, 307-308
 - stromelysin in, 55
 - synovitis reduction and, 54-55
 - tumor necrosis factor in, 55, 56
 - fibrocartilage, 53
 - hyaline, CP3.3, 49, 54
 - in OA
 - loss/breakdown of, 17, 18, 49
 - surface characteristics of, 17, 18, 59
 - thickening of, 47, 48, 49
 - vascularization of, 49
 - repair processes in, 53
 - Cartilage oligomeric matrix protein (COMP), 35
 - Celecoxib (Celebrex), 223-226. See also *COX inhibitors*; *COX-2 inhibitors*.
 - action mechanism, 299
 - Alzheimer's disease and, 220t
 - cardiovascular events and, 224, 225
 - clinical studies
 - ADAPT, 220t, 225
 - APC trial, 220t, 225, 226
 - CLASS, 176, 181, 182, 215-217, 216, 220t, 224, 291
 - PreSAP study, 220t, 225, 226
 - COX-2/COX-1 inhibition ratio for NSAIDs, 179t
 - diclofenac vs, 298
 - gastroprotective effect of, 291, 295
 - GI complications and, 176, 181, 182, 215-217, 216, 220t, 291, 298
 - for hip OA, 296-297
 - naproxen plus lansoprazole with, 298-299
 - warfarin and, 163
 - Celecoxib Long-term Arthritis Safety Study. See *CLASS*.
 - Central alpha₂-agonists, 185t
 - Central sensitization, as pain mechanism, 86-87
 - Charcot's joint, CP6.2, 21t, 51
 - differential diagnosis of, 95-97, 98
 - radiograph of, 98
 - Cholesterol monohydrate crystals, in synovial fluid, CP7.5, 107
 - Choline magnesium trisalicilate, 294-295
 - Chondrocalcinosis, 99, 101, 102
 - Chondrocytes
 - autologous transplantation of, 324
 - cartilage fibrillation and, CP3.3, 48
 - Chondrodysplasia, 33, 35
 - familial, 36, 45
 - Chondroitin sulfate. See *Glucosamine and chondroitin sulfate*.
 - Chondromalacia, 24
 - Chondrophytes, 102
 - Chondroprotective drugs. See *Structure-modifying OA drugs (SMOADs)*.
 - CINODs (COX-inhibiting nitric oxide [NO] donors), 187
 - CLASS (Celecoxib Long-term Arthritis Safety Study), GI complications
 - in, 176, 181, 182, 215-217, 216, 220t, 291
 - Classification of OA, 19-22, 20t-21t
 - idiopathic vs secondary, 19-22, 20t-21t
 - radiographic criteria in, 22-23
 - Clinical features of OA, 79-91
 - joints affected, 79, 80
 - origins of joint pain, 83-86, 84t
 - physical findings, 81t, 87-88
 - symptoms, 79-83, 81t
 - types of pain, 86-87
 - Cock-up toes, 20t
 - Codeine, 245
 - acetaminophen with, 245
 - ibuprofen with, 245
 - COL2A1 gene, 22
 - Cold, therapeutic application of, 133
 - Colitis, COX-2 inhibition and, 213-214
 - Collagen, defects in, 35
 - Collagenase, inhibition of, 312
 - Collateral ligament strain, 93
 - Colonic neoplasia, prevention of, 220t
 - Colorectal polyps, 222
 - Congenital diseases, OA secondary to, 20t-21t
 - Constitutive androstane receptor (CAR), 155
 - Contractures, 87, 94-95, 99t, 126-128
 - Dupuytren's, 94
 - flexion, 94-95
 - in hip, 95, 126
 - in knee, 94-95, 99t, 103, 128
 - prevention, exercises for, 126-128
 - of soft tissue, 128
 - Coronary artery bypass graft, parecoxib/valdecoxib after, 227
 - Coronary artery disease
 - acetaminophen in, 161
 - coxibs in, 229-230
 - Coronary heart disease (CHD), NSAIDs and, 184
 - Corticosteroids, intra-articular injection of, 265-269
 - adverse effects of, 265-266
 - duration of pain relief after, 266-267
 - joint failure after, masking of pain and, 266
 - placement accuracy in, 267
 - structure modification and, 308-309
 - vs hyaluronic acid injection, 276
 - Corticosteroids, systemic, contraindications to, 265

- Cost-effectiveness
 - of joint debridement and lavage, 320
 - of NSAID and coxib therapies, 292-294
- COX (cyclooxygenase)
 - action mechanisms, 209
 - fracture healing and, 214-215
 - GI effects and, 213-214, 213t, 215-217, 216, 218
 - homeostatic vs proinflammatory actions of, 211-215
 - isoforms of, CP12.1, CP12.2, 151, 171, 209-211
 - as PGH-synthase, 209
 - renal function and, 212
 - thrombosis and, 214, 214t, 219-230
- COX inhibitors (coxibs), 209-242. See also *COX-2 inhibitors*; *COX-3 inhibitors*.
 - acetaminophen as, 151-153, 152
 - action mechanisms, CP12.1-12.3, 209-211
 - cardiovascular toxicity of, 220t
 - CLASS and VIGOR safety studies, 215-217, 216, 218
 - cost-effectiveness of, 232-233, 297-298
 - cost of, 294
 - cotherapy with PPI and NSAID, 217-219
 - differences between, CP12.2, 210
 - dosage, lowest effective dose recommended, 297
 - duration of treatment with, 296-297
 - FDA response to, 231-232
 - fracture healing and, 214-215
 - GI effects of, 213-214, 213t, 216
 - isoforms of, CP12.1, CP12.2, 151, 171, 209-211
 - molecular structure of, 299
 - NSAIDs as, 171, 179, 299
 - classification by COX-2/COX-1 inhibition ratio, 179t
 - switching to COX-specific inhibitors, 297-298
 - thrombosis risk and, 219-230
 - other adverse effects of, 230-231
 - subunits of, 299
 - thrombosis and, 214, 214t, 219-230, 220t
 - thromboxane and, 210, 211, 213t, 214, 214t, 228-229
 - underlying pathogenetic mechanisms, 228-230
- COX-2 inhibitors (coxibs), 207-242, 291. See also *COX inhibitors*.
 - action mechanisms, CP12.1-12.3, 209
 - Alzheimer's disease and, 220t, 225
 - cost-effectiveness of, 232-233
 - cotherapy with PPI and NSAID, 217-219
 - FDA response to, 231-232
 - fracture healing and, 214-215
 - GI effects and, 213-214, 213t, 215-217, 216, 218
 - homeostatic vs proinflammatory actions of, CP12.3, 211-215
 - molecular basis of, 209-211
 - NSAIDs as, 293t, 299
 - NSAIDs, switching from, 297-298
- COX-2 inhibitors (coxibs) (*continued*)
 - NSAIDs vs, 217-219, 292
 - PPI co-prescription with, 217-219, 292, 293t, 294t
 - renal function and, 212
- COX-3 inhibitors, NSAIDs and acetaminophen as, 151, 171
- COX-inhibiting nitric oxide (NO) donators (CINODs, NO-NSAIDs), 187
- Coxae senilis, 20t
- Coxibs. See *COX inhibitors*; *COX-2 inhibitors*.
- Crepitus, 81t, 83, 87
 - palpation of, 103
- Crutches, 126
- Cryoglobulinemia, 133
- Cyclooxygenase. See *COX entries*.
- Cyclooxygenase inhibitors. See *COX inhibitors*; *COX-2 inhibitors*.
- Cysts
 - bone, CP3.2, 49-50, 51
 - popliteal (Baker's), 51, 103-104, 104, 105
- Cytokines, 16, 55-56

- Darvocet, 245
- Darvon, 245
- De Quervain's tenosynovitis, 93, 94t
- Deep vein thrombosis, after arthroplasty, 322
- Definitions of OA, 15-26
 - contemporary, 17-23
 - key points not recognized by, 19t
 - disorders that are not OA, 23-24
- Deformity
 - causes of, 93-94
 - flexion contractures as, 94-95, 97
 - of knees, CP6.2, 95-97, 98
 - misinterpretation of, 93-97
 - nodal OA, 20t, 22, 83
 - of toe, CP5.1, 83
- Diabetes mellitus, 21t, 102
 - cheirarthropathy in, 94
 - glucosamine and, 256
 - injected corticosteroid effects in, 266
- Diacerhein, 312-313
- Diagnosis of OA, 93-106
 - clinical diagnosis, 23, 88
 - history taking in, 101-102
 - joints commonly affected in, 79, 80
 - knee OA, 88
 - misinterpretation of deformity in, 93-97
 - misinterpretation of laboratory results in, 99-100, 101t
 - misinterpretation of pain in, 93, 94t
 - misinterpretation of radiograph in, 97-99, 99t
 - pain origins in, 93
 - physical examination in, 102-105

- Diagnosis of OA (*continued*)
 physical findings, 81t, 87-88
 pitfalls in, 93-106
 avoiding, 100-105
 radiography in, 111-116
 symptoms of OA, 79-83, 81t
- Diathermy, 133
- Diclofenac, 194-199
 acetaminophen vs, 148, 172, 290
 adverse events, 195-196
 celecoxib vs, 298
 COX inhibition by, 179t
 diclofenac sodium gel (DSG), 194-196, 291-292
 efficacy in OA, 197t
 long-term, 171-172
 gastrointestinal side effects of, 160
 GI safety profile of, 291
 omeprazole with, 298
 structure modification and, 308
 topical solution (DSTS, Pennsaid), 194-198
 FDA concerns on, 198-199
- Diclofenac/misoprostol combination (Arthrotec), 290
 acetaminophen vs, 150
 pain severity and, 150
- Diffuse idiopathic skeletal hyperostosis (DISH), 20t, 23-24, 99, 100
- Disability
 determining degree of, 117
 exercise and prevention of, 117-119
 risk factors for, inactivity as, 120
- Disease-modifying OA drugs (DMOADs). See *Structure-modifying OA drugs (SMOADs)*.
- Diseases, rare, OA due to, 18-19, 20t-21t
- DISH (diffuse idiopathic skeletal hyperostosis), 20t, 23-24, 99, 100
- Distraction, 68
- Diuretics, 184, 185t
- DMOADs (Disease-modifying OA drugs). See *Structure-modifying OA drugs (SMOADs)*.
- Dogs. See *Canine cruciate-deficiency model*.
- Doxycycline, 310-312
 action mechanisms, 310-311
 structure modification by, 310-312
- Dupuytren's contracture, 94
- Dyspepsia
 acetaminophen and, 160, 162
 coxibs and, 291
 misoprostol and, 177
 NSAIDs and, 175, 177, 299
- Edema, of bone marrow, OA and, 40
- EDGE (Etoricoxib vs Diclofenac Sodium Gastrointestinal Tolerability and Effect), 220t
- Effusion
 pseudothrombophlebitis and, 103-105
 synovial, 87, 107, 108t
- Elastic bandages, for knee OA, proprioception and, 134, 136-137
- Elbow, OA of, 59, 79
- Elderly population
 CLASS study of. See *CLASS*.
 coxibs for, 292-294
 NSAID choice for, 178, 292
 NSAID interactions in, 184, 259
 NSAID withdrawal in, 190-193, 190t
 opioid side effects in, 243
 projected growth of, 29
 risks for medication adverse effects in, 173-174, 259
- Endocrine diseases, 21t
- Endothelial cells, 211
 COX isoforms and, 211, 212, 214t
 prostaglandin synthesis and, 153, 209
- Enthesis inflammation, 84t
- Epidemiology of OA, 27-46
 prevalence, 27, 28
 risk factors, 27-39, 30t
- Epiphysis, slipped, 20t, 79
- Erythrocyte sedimentation rate, 99, 101t
- Estrogen deficiency, 38
- Ethnicity, OA and, 28
- Etiopathogenesis of OA, xiii, 53-78. See also *Pathology of OA*.
 bone/cartilage microcracks in, CP4.3, 66-67
 bone remodeling in, CP4.4, 67
 cartilage healing and remodeling in, 55-56
 clinical relevance, 68-70
 as joint failure, 15, 16, 47, 53, 54, 305
 joint overload/underload in, 57-59
 mechanical stress in, xiii, 15, 57, 305-306
 OA as mechanically induced, 57
 peak adduction moment (PAM), 64-65
 periarticular muscle, importance in joint protection, 61-63
 risk factors for. See *Risk factors for OA*.
 stress reduction, and restoration of tissue/function, 53
 subchondral bone in, CP4.3, 65-67, 66
 viscoelasticity of cartilage/bone and, 59-61
- Etodolac, 179t
- Etoricoxib, 220t, 296-297
- Euflexxa, 271, 274
 safety of, 282
- EULAR. See *European League Against Rheumatism*.
- European League Against Rheumatism (EULAR)
 knee OA diagnosis, 88
 OA classification criteria, 23
 OA management guidelines, 150-151

- Exercise, 117-128
 aerobic, 119-122
 cartilage integrity and, 119
 compliance in, 119
 for contracture prevention, 126-128
 daily, necessary for articular cartilage integrity, 119
 dosing of, 121-122
 examples of, 122
 footwear for, 122, 126, 289
 goals of, 118
 health benefits of, 119
 heart rate in, 118, 121, 122
 for joint protection, 125-126
 for knee, 122-126, 123-124, 130-131
 load during, 119
 precautions in, 118
 to prevent disability, 117-118
 for quadriceps, 123, 124
 range of motion (ROM) and strengthening, 122-125, 123, 124, 128
 stress test before, 118
 stretching, 119
 warm-up before, 119
- Familial chondrodysplasia, 36, 45
 Famotidine, 178
 FAST (Fitness Arthritis and Senior Trial), 125
 FDA. See *Food and Drug Administration*.
 Femoral condyle
 bony remodeling in, CP4.4
 cartilage remodeling in, 48
 sections of, normal vs OA, 49
 ulceration of, doxycycline and, CP19.1, 310
 Femoral head, osteonecrosis of, 95, 97
 Fenoprofen, 179t
 Fibrillation of cartilage, CP3.3, CP4.1, 47-48, 56
 Fibrosis, 51-52
 Fitness Arthritis and Senior Trial (FAST), 125
 Flexion contractures of joints, 94-95
 Flurbiprofen, 179t
 Food and Drug Administration (FDA)
 response to acetaminophen, 164-165, 245, 247
 response to coxibs, 231-232
 response to NSAIDs, 232
 response to topical NSAIDs, 198-199
 Foot, OA of, 20t
 Footwear
 for exercise, 122, 126
 wedged insoles in, 134-135
 Forestier's disease, 20t, 23-24
 Fracture healing, coxibs and, 214-215
 Fracture risk, with PPIs, 296
 Framingham Study, 38
 Frostbite, 21t
- GAIT (Glucosamine Chondroitin Arthritis Intervention Trial), 251, 254
 Gastric acid suppression, 176-178
 Gastroenteropathy
 acetaminophen and, 160-162, 160
 coxibs and, 213-214, 213t, 215-217, 216
 death from, 174-175, 174
 meloxicam and, 179-182, 180, 183t
 NSAIDs and, CP11.1, 160, 173-182, 292, 293t
 approach summary, 293t
 concomitant aspirin use and, 175-177, 177
- Gastrointestinal effects
 acetaminophen and, 160-162, 160
 aspirin and, 175-176, 177, 178
 in CLASS and VIGOR studies, 176, 181, 182, 215-217, 216, 220t, 291
 COX-1 and, 213-214, 213t
 in MELISSA and SELECT trials, 180
 NSAIDs and, 160, 173-182, 293t
- Gastroprotective therapies, 177, 178, 217-219, 292, 294t
 Gaucher's disease, 21t
 Gelatinase, 310
 Gender
 Heberden's nodes and, 34-35
 knee OA progression and, 39t
 OA and, 28, 38
 pain and disability and, 40
 Genetic factors in OA, 22, 34-37
 future identification of, 306
 Genetic syndromes, CP1.2, 22
 Genetics, Arthrosis, and Progression (GARP) study, 37
 Genu varum deformity, CP5.2, 83
 Glenohumeral joint
 bursitis and tendinitis in, 86
 OA of, 20t, 22, 79
 Glomerulonephritis, 159
 Glucosamine and chondroitin sulfate, 251-258
 action mechanisms proposed, 254-255
 clinical studies of, 251-253
 meta-analyses of, 252-253
 Cochrane review of, 252
 diabetes and, 256
 radioactive glucosamine studies, 254, 255
 safety of, 256
 side effects of, 256
 structure modification and, 352-356
 warfarin and, 256
 Glucosamine Chondroitin Arthritis Intervention Trial (GAIT), 251, 254

- Gout, 21t
 synovial fluid characteristics in, CP7.2, 107
- Gram stain, of synovial fluid, CP7.6, 87, 107
- Growth factors
 in cartilage breakdown, 49, 55
 hyaluronan and, 274
- Hallux rigidus, 20t
- Hallux valgus, 20t
- Hammer toes, 20t
- Hand OA, 20t, 79
 age and gender and, 28
 classification of, 23
 diclofenac trial and, 195
 lidocaine patches for, 261
 splinting for, 136, 138-139
- Handicap, definition of, 117
- Healon, 277t
- Heart rate target, in exercise, 118, 121, 122
- Heat therapy, heat, 132-133, 132t
- Heberden's nodes, 20t, 22, 83
 gender and, 34-35
 heat therapy for, 132
 knee OA progression and, 39t
 lidocaine patches for, 261
 physical examination of, 87, 102
 section of, CP1.1, 15
- Helicobacter pylori* infection, 175
- Hemochromatosis, 21t, 99, 102
- Hemoglobinopathy, 21t
- Hemoglobinuria, paroxysmal cold, 133
- Heparin, 322
- Hepatic function
 aminotransferase levels, 148, 149, 153
 monitoring of, 186-187
- Hepatotoxicity
 acetaminophen and, 155-158
 alcohol in, 157-158
- Hip
 congenital dislocation of, 79
 contractures of, 95, 126
 fracture, PPIs and, 296
 OA of, 20t, 79
 acetaminophen for, 292
 age and, 28
 classification of, 23
 end-stage, CP3.2
 estrogen use, benefits of, 38
 occupational overuse and, 30, 31t
 pain in, 81
 management of, 147
- Hip, OA of (*continued*)
 prevention of, 31t
 shape changes in, 32-33
 range of motion requirements for locomotion, 129t
 spinal joint pain referred to, 93
 Statistical Shape Model and, 37
 total arthroplasty of, 321
 weight loss and, 131
- Histamine₂ receptor antagonists, 176, 178, 296
- History taking, 101-102
- Homan's sign, 104
- Hyalgan, 271, 309-310
- Hyaline cartilage, CP3.3, 49, 54
- Hyaluronan (HA), 271-287
 intra-articular injection of, 271-287
 accelerated joint damage and, 309-310
 action mechanisms of, 274-276
 conclusion on, 282-283
 effects on OA pain, 272-274, 273
 FDA approval of, 271, 272
 HA molecular weight in, 271, 272, 276
 HA preparations for, 271
 half-life of, 271
 placebo response to, 276-280, 279t
 predictors of response to, 280, 281
 prostaglandin concentration and, 309
 rationale for, 271
 safety of, 281-282
 side effects of, 281-282
 structure modification and, 280, 309-310
 vs steroid injection, 276
 synovial fluid and, 274-276, 277t
- Hylan G-F 20. See *Symvisc*.
- Hypermobility syndromes, 20t
- Hyperostosis, 20t
- Hyperparathyroidism, 21t
- Hypertension
 acetaminophen and, 153, 164
 intramedullary venous, OA pain and, 68
 NSAID use and, 182-185, 185t, 187
 prostaglandin I₂ inhibition and, 182-185, 185t
- Hypertension Optimal Treatment Trial, 224
- Hypertrophic osteoarthropathy, 94, 96
- Hypertrophic repair of articular cartilage, 47, 48, 49
- Hypothyroidism, 21t, 102
- IA stress. See *Intra-articular (IA) stress*.
- Ibuprofen. See also *NSAIDs*.
 acetaminophen vs, 147
 aspirin antiplatelet effect inhibited by, CP11.2, 188-191

- Ibuprofen (*continued*)
 COX inhibition by, 179t
 gastrointestinal effects of, 160
 renal side effects of, 184
- Idiopathic OA, 19, 20t
 joints commonly affected by, 20t, 79, 80
- Idiopathic skeletal hyperostosis, diffuse (DISH), 20t, 23-24, 99, 100
- Inactivity, risks of, 119-121, 120
- Indomethacin
 azapropazone vs, 308
 COX inhibition by, 179t
 gastrointestinal effects of, 160, 178
 structure modification and, 308
 thromboxane inhibition by, 181
- Infection, 21t, 102
 after total arthroplasty, 322
Helicobacter pylori, 175
 in joint, bacterial, synovial fluid analysis for, CP7.6, 97, 107
- Inflammation in joint, 54
 overemphasis on, 305
 pain and, 84t
 synovial fluid analysis, 107, 108t
- Inflammatory connective tissue disease, 99
- Insoles, wedged, 134-135
- Interleukin-1
 in cartilage breakdown, 55, 56
 hyaluronan and, 274
- Interphalangeal OA, 16
- Intra-articular corticosteroid injection, 265-269, 308-309
- Intra-articular hyaluronan injection, 271-287, 309-310
- Intra-articular (IA) stress, xiii, 22. See also *Load distribution*; *Stress*.
 reduction of, 53-54, 57, 306
- Isometric exercises, quadriceps-strengthening, 122, 123, 124, 289
- Isoniazide, 153
- Joint(s). See also *specific joints*.
 abnormal passive movement of, 103
 aspiration of fluid from, 265
 cartilage in. See *Cartilage*.
 contractures of, 94-95, 126-128
 crepitus in, 81t, 83, 87
 debridement and lavage of, 319-320, 320
 effusion from. See *Effusion*
 failure of, 15, 16, 47, 53, 54, 305
 instability of, 130-131
 intra-articular stress in, xiii, 22
 load-bearing vs weight-bearing, 16
 OA in
 abnormal joint mechanics in, 53-54, 103
 characteristic anatomy, 16
- Joint(s), OA in (*continued*)
 commonly affected joints, 20t
 as failed repair of joint, 15, 16
 involving all tissues of, 15, 16, 47, 48t, 53, 54
 joints affected, 79, 80
 radiographic severity and pain scale, 114t
 risk factors for, 27-39, 30t
 shape changes and, 32-33
 pain in. See *Pain*.
 physical examination of, 102-105
 protection of, 289
 adaptive mechanisms in, 16
 exercise for, 125-126
 for knee, 30, 31t, 127t
 patient education in, 139
 periarticular muscles in, 61-63, 125
 stress reduction, 53, 59
 stiffness in, 65, 68
 swelling in, 17, 47, 81t, 87-88
 exercise and, 126
 physical examination of, 102-103
 total arthroplasty of, 321-324, 323t
- Joint aspiration, 265
- Joint failure, OA as, 15, 16, 47, 53, 54, 305
- Joint space narrowing (JSN), 111, 112
 diacerhein and, 313
 doxycycline and, 311-312
 glucosamine and, 254
 IA corticosteroid injection and, 308-309
 indomethacin and, 308
- Kaiser Permanente National Total Joint Replacement Registry, 321
- Kashin-Bek disease, 21t
- Kellgren and Lawrence radiologic grading scale, 111-112, 114t, 115
- Ketoprofen
 COX inhibition ratio of, 179t
 gastrointestinal toxicity of, 178
 vs acetaminophen, 150
- Ketorolac, 179t
- Kidneys. See *Renal function*.
- Knee
 arthroplasty of
 total (TKA), 321-323, 323t, 326t-327t
 unicompartmental, 324
 Charcot's arthropathy in, CP6.2, 95-97, 98
 contractures of, 94-95, 99t, 103, 128
 deformity of, CP6.2, 95-97, 98
 exercises for, 122-126, 123-124
 flexion contracture of, 94-95, 99t, 128
 flexion due to pain, 98

Knee (*continued*)

hyperextension of, CP4.2
joint space narrowing in, 111, 112
OA of, 79
age and, 28-30, 28
anserine bursitis and, 86, 94, 95
bowing (genu varum) in, CP5.2, 83
classification of, 23
crepitus in, 83
debridement and lavage for, 319-320, 320
diagnosis of, 88
elastic bandages for, 134, 136-137
gender and, 28
hyaluronan injection for, 271-287
indomethacin in, 308
instability in, 130-131
joint protection for, 59, 127t
Kellgren and Lawrence scale for, 111, 114t, 115
knee braces in, 134
lidocaine patches for, 261
MRI abnormality in, 84
obesity and, 31t, 33-34, 39, 39t
pain in, 84-85
management of, 147, 150-151
patellar taping for, 135-136
pathology of, CP3.1
peak adduction moment and, 64-65
physical fitness/exercise and, 120
popliteal cyst with, 103-104
prevention strategies, 31t
progression of, 39, 39t
proprioception in, 134
quadriceps weakness and, 34, 63
radiographic severity and pain scale in, 114t, 115
radiography of knee, 111, 112
stability program for, 130-131
synovium in, CP3.5, 50-51
tidal irrigation for, 137-139
trauma and, CP4.2, 30-32, 31t
wedged insoles for, 134-135
weight loss for, 131
occupational and repetitive overuse injuries, 30-32, 31t
overuse of, 30, 31t
pain in, 84-85
prevalence of, 40, 41t
referred from hip, 94t, 102
physical examination of, 102
protection of, 61-63
radiography of, patient position and, 111, 112
range of motion requirements for locomotion, 129t
taping of, patellar, 135-136, 289

Knee braces, functional, 134

L-NIL (*N*-iminoethyl-L-lysine), 311

Laboratory results, misinterpretation of, 99-100, 101t

Lansoprazole, 176

cotherapy with naproxen vs celecoxib, 295, 298-299

with naproxen (Prevacid NapraPAC), 295, 296

Legg-Calvé-Perthes disease, 20t, 79

Leptin, 33-34

Lidocaine patches, 261

Ligaments, changes in OA, 51-52

Limp, 83

Liver

acetaminophen metabolism in, 154

acetaminophen toxicity and, 149, 155-158

Liver function

aminotransferase levels and, 148, 149, 153

monitoring of, 186-187

Load-bearing cartilage, damage of, 24

Load-bearing exercise, 119

Load-bearing joints, vs weight-bearing, 16

Load distribution, OA and, 16-17, 53-54, 56, 289. See also *Repetitive impulsive loading*.

microdamage and, 306

osteotomy and, 306, 324-325

peak adduction moment, 64-65

rate of loading, importance of, 56, 60

viscoelasticity, importance of, 59-61

Lumiracoxib

cardiovascular events with, vs naproxen and ibuprofen, 227

on TARGET, 220t, 227

Management of OA. See *Treatment of OA*.

Matrix metalloproteinase activity, 311

in cartilage breakdown, 55, 56

inhibitors of, 306, 310-311

Mechanical stress, normalization of, xiii, 53-54, 57, 306. See also *Load distribution*; *Stress*.

Mechanically-induced, OA as, xiii, 15, 57, 305-306

Meclofenamate, 178

Mefenamic acid, 179t

MELISSA (Meloxicam Large-scale International Study Safety

Assessment) trial, 180

Meloxicam, 179-182

action mechanism, 179

COX-2 selectivity of, 179, 181, 291

COX inhibition by, 179t

efficacy of, 179

gastrointestinal effects of, 179-182, 180, 183t

in MELISSA and SELECT trials, 180

platelet aggregation and, 181

- Meloxicam Large-Scale International Study Safety Assessment (MELISSA) trial, 180
- Meniscus
 degeneration/damage in OA, 48t, 54, 148
 injury of, knee OA and, 30
 torn
 arthroscopic surgery for, 319
 crepitus and, 103
- Meniscectomy, 30
- Mesenchymal stem cells, 324
- Metabolic diseases, 21t, 102
- Metalloproteinase inhibitors, 306, 310-311
- Metalloproteinases, 311
- Metatarsophalangeal joint, first, OA of, CP5.1, 83, 88
- Micro-incoordination, 62
- Microcracks, in bone or cartilage, CP4.3, 66-67
- Microklutziness, 62
- Microwave diathermy, 133
- Misoprostol, 177-178, 292
 diclofenac/misoprostol combination, 150
 as gastroprotector, 177
 NSAIDs with, 177-178, 292, 293t, 295
- MMP-3 (stromelysin) gene, 55
- Monosodium urate crystals, CP7.2, 107
- Morphine, 243
- Mosaicplasty, 324
- Mseleni disease, 21t
- Muscles
 periarticular, 34, 52, 61-63, 125-126
 in protecting joints, 61-63, 125
 wasting of, 52
 weakness of, 34
- Mutations, 34-37
- Myocardial infarction
 acetaminophen and, 164
 risk factors for, 221t
 rofecoxib and, 221-223
- N*-acetyl-p-benzoquinoneimine (NAPQI), 153, 154, 157
- N*-iminoethyl-L-lysine (L-NIL), 311
- Nabumetone
 COX inhibition by, 179t
 gastrointestinal effects of, 178
- Nails, clubbing of, 94
- NAPQI, 153, 154, 157
- Naproxacinod (formerly AZD3582), 187
- Naproxen, 226-228. See also *NSAIDs*.
 acetaminophen vs, 292, 307-308
 acetaminophen with, 292
 on ADAPT, 226-227
- Naproxen (*continued*)
 aspirin with, 188-189, 295-296
 celecoxib vs, 296
 celecoxib with, 298-299
 COX inhibition by, 179t
 dosage of, 173
 gastrointestinal bleeding with, 160
 hyaluronic acid injection vs, 279t
 with lansoprazole and celecoxib, 295, 298-299
 with lansoprazole (Prevacid NapraPAC), 295, 296
 naproxcinod vs, 187
 revisiting, 226-228
 structure modifying effects of, 307-308
 on TARGET, 227
- Narcotics. See *Opioids*.
- Neurologic defects and OA, 59
- Neuropathic arthropathy. See *Charcot's joint*.
- Neuropathic pain, 86-87
- NFat deficient mice, CP1.2
- Nimesulide, 179t
- Nitric oxide
 COX-inhibiting nitric oxide (NO) donators (CINODs, NO-NSAIDs), 187
 functions of, 187, 311
- Nitric oxide synthase, inducible, inhibition of, 311
- Nociceptive pain, 86
- Nodal OA, 20t, 83, 102. See also *Bouchard's nodes*; *Heberden's nodes*.
- Nonacetylated salicylates, 294-295
- Nonpharmacologic therapy for OA pain, 117-146, 289
 acupuncture, 139-140
 ambulatory assistive devices, 128-130
 elastic bandages for knee OA, 136-137
 exercise, 117-128
 functional knee braces, 134
 importance of, 289, 297
 as NSAID-sparing intervention, 297
 patellar taping, 135-136
 patient education, 139, 289
 periodic phone calls, 133
 splinting for hand OA, 136, 138-139
 stability program for knee OA, 130-131
 thermal modalities, 131-133
 tidal irrigation of knee, 137-139
 wedged insoles, 134-135
 weight loss, 131
- Nonselective NSAIDs. See *NSAIDs*.
- Nonsteroidal anti-inflammatory drugs. See *NSAIDs*.

NSAIDs (nonsteroidal anti-inflammatory drugs), 171-208.

See also *Cox-2 inhibitors; specific agents.*

acetaminophen vs
for inflammation, 149-150
for pain, 147-148, 150-151, 289-290, 290t
acetaminophen with, 156, 173, 291, 292
acid suppression therapy with, 176-178
action mechanisms, CP12.3, 171
adverse effects, 173-187, 291
accelerated joint breakdown, 308
cardiovascular-renal effects, 182-187, 185t, 186
gastroenteropathy, CP11.1, 160, 173-182, 293t
alcohol and, 175
concomitant aspirin use and, 175-176, 177
deaths, NSAID-related, 174-175, 174
differences among NSAIDs, 160, 178-179
gastric acid suppression and, 176-178
Helicobacter pylori infection and, 175
meloxicam and, 179-182, 180
monitoring for, 186-187
other GI effects, 182
anticoagulant interaction with, 175
antihypertensive drugs and, 182-185, 185t, 187
aspirin use with, 175-176, 177, 292, 293t, 295-296
inhibition of aspirin antiplatelet effect, CP11.2, 188-191
cardiovascular effects of, 182-187, 185t
cartilage breakdown and, 307-308
cost-effectiveness of, 297
COX inhibition by, 171, 179, 299. See also *COX inhibitors;*
COX-2 inhibitors.
classification by COX-2/COX-1 inhibition ratio, 179t
COX-2 selective, 209-242
fracture healing and, 214-215
indications for, 293t
switching to COX-inhibitors, 297-298
COX inhibition vs, 292
dosing regimens, 172-173
lowest dose recommendation, 292
efficacy in OA
dosing regimens and, 172-173
for inflammation, 149-150, 171
long term, 171-172
for pain, 147-148, 150-151, 171, 289-290, 290t
short term, 171
FDA response to, 198-199, 232
as initial therapy, 150
misoprostol co-prescription with, 177-178
monitoring with, 186-187
NO-NSAIDs, 187
nonselective, 171-208

NSAIDs (nonsteroidal anti-inflammatory drugs) (*continued*)

optimization of therapy with, 297-300
prostaglandin I₂ inhibition by, 182-185, 185t, 186
proton pump inhibitor cotherapy with, 293t, 295
cost of, 298
renal effects of, 184-187, 186
structure modification by, 307-308
topical, 193-199, 259, 291-292
treatment recommendations, 294t
warfarin with, 175
withdrawal from, 190-193, 190t
Nurses' Health Study, 163-164
Nutritional deficiencies, 38-39

OARSI. See *Osteoarthritis Research Society International.*

Obesity

C-reactive protein in, 99, 101t
knee OA and, 131
OA secondary to, 21t
as risk factor for OA, 31t, 33-34, 39, 39t, 131
weight loss for, 131, 289

Occupational overuse of joints, 30-32, 31t

Ochronosis, 21t

Omeprazole

with diclofenac, vs celecoxib, 298
as gastroprotector, 177, 178, 217

Opioids, 243-249

action mechanisms of, 243
addiction/tolerance to, 243-244, 244t
combination formulations with acetaminophen, 156, 164-165
dosage and administration, 172, 244-247
efficacy for OA pain, 243, 245
in elderly, 243
fracture risk with, 243
respiratory depression by, 243
side effects of, 243, 246-247
withdrawal from, 243

Orthotics, foot, 134-135, 289

Orthovisc, 271

intra-articular steroid therapies and, 271
for knee pain, 280, 281

Osteoarthritis (OA)

asymptomatic, 19t, 53
definitions of, 15-26, 19t
etiopathogenesis, vs pathogenesis in, xiii
as failed repair of damage, 15, 16
as involving all joint tissues, 15, 16, 47, 48t, 53, 54
as mechanically-induced, xiii, 15, 57, 305-306
primary vs secondary classification of, 19-22, 20t-21t
severity scale, 111-112, 114t, 115
terminology use in, xiii

- Osteoarthritis Research Society International (OARSI),
 recommendations, 147, 193, 272
- Osteoarthropathy, hypertrophic, 94, 96
- Osteochondral plugs, autologous, 324
- Osteochondritis, 21t
- Osteochondritis dissecans, 102
- Osteochondromatosis, 102
- Osteonecrosis, of femoral head, 95, 97
- Osteophytes, 50, 51, 102
 bony swelling due to, CP5.1, 83, 87-88
 due to aging, 112
 pain mechanism in, 84t
- Osteoporosis, 21t
- Osteotomy, 68, 69, 306, 324-325
- Oxaprozin, 179t
- Oxycodone, 245
- Paget's disease, 21t
- Pain, xiii, 79-81
 from bursitis, 86
 characteristics of, 79-81
 differential diagnosis of, 93, 94t
 intramedullary venous hypertension and, 68
 knee, prevalence for, 40, 41t
 management of, 289-303. See also *Treatment of OA*.
 acetaminophen for, 147-149, 151, 156, 289-291, 290t
 guidelines for, 150-151
 NSAIDs for, 171-172, 292, 294t
 masking of, joint failure and, 266
 misinterpretation in diagnosis, 93, 94t
 movements evoking, 81-82
 neuropathic, 86-87
 nociceptive, 86
 nocturnal, 81
 nonpharmacologic therapy for, 117-146
 origins of joint pain, 83-86, 84t
 origins of OA pain, 299-300
 physical examination of, 102
 radiographic severity and, 113, 114t
 referred, 82, 93, 94t, 102
 diagnosis of, 102
 relief
 arthroplasty for, 68-69
 decompression/osteotomy for, 68, 69
 risk factors for, 39-40
 soft tissue-related, 86, 93, 94t
 types of, 86-87
- Paracetamol, 150-151
- Parecoxib, cardiovascular events with, 227
- Parkinson's disease, 94t
- Patellar taping, 135-136, 289
- Patellofemoral joint, eliciting pain in, 102
- Pathogenesis of OA, vs etiopathogenesis, xiii.
 See also *Etiopathogenesis of OA*.
- Pathology of OA, 47-52, 48t
 common factor in, 53
 of hip, CP3.2
 of knee, CP3.1
- Patient education
 on joint protection, 139
 on OA management, 139, 289
- Peak adduction moment (PAM), 64-65
- Pennsaid. See *Diclofenac*.
- Percocet, 164, 247
- Periarticular muscles
 exercise for, 123, 124, 125-126, 289
 importance in joint protection, 61-63
 wasting of, 52, 88
 weakness in, 34
- Periostitis, 94, 96
- Peripheral alpha₁-adrenergics, 185t
- PGH-synthase. See *COX*; *COX inhibitors*.
- Pharmacologic therapy, xiv, 289-303. See also *specific drugs or drug types*.
 acetaminophen, 147-170
 as adjunct to nonpharmacologic measures, 289
 COX inhibitors (coxibs), 207-242
 initial therapy, 289-297
 acetaminophen for, 149, 150-151, 156, 289, 291-292
 NSAIDs, 171-208
 optimization, for patients on NSAIDs, 297-300
 patient individualization in, 294
 rational strategy for, 289-303
 structure-modifying OA drugs (SMOADs), 305-318
- Phenylbutazone, vs acetaminophen, 149
- Phone calls, periodic contact with, 133
- Physical activity. See also *Exercise*.
 OA limitation of, 117
- Physical examination, 102-105
- Physician's Health Study, 189-190
- Piroxicam
 COX inhibition by, 179t
 gastrointestinal bleeding and, 160
 gastrointestinal toxicity of, 178
- Pistol-grip deformity, 32
- Platelets
 aspirin and, 176
 ibuprofen inhibition of effect, CP11.2, 188-191
 meloxicam and, 181
 PG inhibition and, 171

Polio, 58

Polyps, adenomatous

- on APC trial, 220t, 225, 226
- on APPROVe trial, 220t, 232
- on PreSAP trial, 220t, 225, 226

Popliteal (Baker's) cyst, 51, 103-104

- imaging of, 104, 105

PPIs. See *Proton pump inhibitors*.

PRECISION, 230

PreSAP (Prevention of Spontaneous Adenomatous Polyps), 220t, 225, 226

Presentation of OA, 19t

Prevacid NapraPAC, 295, 296

Prevalence of OA, 27, 28

Prevention of OA

- obesity reduction, 31t
- prevention of knee injury, 31t

Prevention of Spontaneous Adenomatous Polyps. See *PreSAP*.

Primary OA. See *Idiopathic OA*.

Progression of OA. See also *Pathology of OA*.

- hypertrophic cartilage repair in, 47, 48, 49
- misunderstandings about, 88
- risk factors for, 39, 39t

Propoxyphene, 245

Prospective Randomized Evaluation of Celecoxib Integrated Safety vs Ibuprofen or Naproxen (PRECISION), 230

Prostaglandin

- COX/COX inhibitors and, 209
- prostaglandin I₂, 209
- stimulation of synthesis of, 312

Prostaglandin inhibition

- acetaminophen and, 153, 161
- cardiovascular effects of, 182-185, 185t
- hyaluronan and, 274
- NSAIDs and, 182-185, 185t, 186
- renal effects of, 185-187, 186

Proteoglycan, 16, 17

- depletion, 274, 282
- NSAID modification of, 307
- synthesis of, 47, 266
 - acetaminophen and, 153

Proton pump inhibitors (PPIs)

- cost effectiveness of, 292, 298
- coxibs with, 292, 293t, 294t
- fracture risk with, 296
- with NSAIDs therapy
 - coxibs vs, 217-219
 - gastroprotector role in, 177, 178, 292, 293t, 294t, 295-296

Pseudogout, synovial fluid characteristics in, CP7.3, 107

Pseudothrombophlebitis, diagnosis of, 103-105

Psoriatic arthritis, CP6.1, 94

Quadriceps

- exercises for, 122, 123, 124, 289
- importance for joint protection, 61-63
- weakness of, knee OA and, 34, 63

Race/ethnicity, OA and, 28

Radiographic severity, Kellgren and Lawrence scale of, 111-112, 114t, 115

Radiography, 111-116

- Kellgren and Lawrence grading scale in, 111-112, 114t, 115
- of knee, 111, 112
- misinterpretation of, 97-99, 99t
- of OA, 19t, 22-23
- pain correlation with, 113
- serial, 113
- and severity of symptoms, 111

Range of motion

- contractures and, 128
- exercises, 122-125, 123, 124, 128
- in OA, 128
- requirements for locomotor activities, 129t

Raynaud's phenomenon, 133

Referred pain, 82, 93, 94t, 102

Renal function

- acetaminophen and, 158-160
- COX inhibition and, 212
- monitoring of, 186-187
- NSAIDs and, 184-187, 186
- prostaglandin inhibition and, 186

Repetitive impulsive loading (RIL), CP4.1, 53, 57-59

- periarticular muscles, importance for, 61-63
- viscoelasticity of bone/cartilage and, 59-61

Repetitive stress, OA and, 30-32, 31t

Rheumatic diseases, soft tissue changes in, 86, 93, 94t

Rheumatoid arthritis

- coincident with OA, 21t
- differential diagnosis of, 99

Rheumatoid factor titer, 99, 101t

Rhubarb, diacerhein from, 312-313

Rickets, 102

Risk factors

- for OA, 27-39, 30t
 - age, gender, race, 27-30, 28
 - bone density, 37
 - estrogen deficiency, 38
 - genetic factors, 34-37
 - nutritional deficiencies, 38-39
 - obesity, 31t, 33-34
 - periarticular muscle weakness, 34, 63
 - shape changes in joint, 32-33
 - trauma and repetitive stress, 30-32, 31t, 57

- Risk factors (*continued*)
 for OA pain and disability, 39-40
 for OA progression, 39, 39t
- Rofecoxib (Vioxx), 221-223, 228, 291. See also *COX inhibitors*;
COX-2 inhibitors.
- APPROVe trial, 220t, 232
- cardiovascular event risk with, 226
- COX inhibition by, 179t
- risk factors for MI, 221t
- VIGOR trial, 215-217, 220t
- withdrawal from market, 231, 291
- Rooster comb hyaluronan. See *Synvisc*.
- Rubefaciants, 259-263
- Running, long-distance, 32
- Sacroiliac OA, 20t
- Safety and Efficacy Large-scale Evaluation of COX Inhibitors
 Therapies (SELECT) trial, 180
- Salsalate, 294-295
- Secondary OA, 19-22, 20t-21t, 102
 all OA as secondary, 19-22
 symptoms in, 102
- SELECT (Safety and Efficacy Large-scale Evaluation of COX
 Inhibitors Therapies) trial, 180
- Septic arthritis, 102
- Shock absorption, by periarticular muscles, 61-63, 125
- Shoes, 122, 126, 289
- Shortwave diathermy, 133
- Shoulder, spinal pain referred to, 102
- Single nucleotide polymorphisms (SNPs), 37
- Slipped epiphysis, 20t, 79
- SMOADs. See *Structure-modifying OA drugs*.
- Sodium hyaluronate. See *Hyalgan*; *Supartz*.
- Soft tissue
 pain in, 86, 93, 94t
 rheumatism, 94t
 swelling in, 103
- Space, bone mass in, 61
- Spine
 hip/gluteal pain referred from, 93
 OA of, 20t, 79, 82
 pain in, 82
 shoulder pain referred from, 102
- Splinting, for hand OA, 136, 138-139
- Spondylosis, 20t
- Stem cells, mesenchymal, 324
- Steroids. See *Corticosteroids*.
- Stress
 excessive/abnormal, OA and, 15, 22, 53-54, 55-59
 normalization of, and tissue restoration/function, xiii, 53-54, 57, 306
- Stress (*continued*)
 protection from
 periarticular muscle in, 61-63
 subchondral bone viscoelasticity in, 59-61
 repetitive, OA and, 30-32, 31t
- Stress test, before exercise, 118
- Stroke, acetaminophen and, 164
- Stromelysin, 16, 55
- Structure-modifying OA drugs (SMOADs), 305-318
 acetaminophen as, 307-308
 clinical trials, review of, 307
 diacerhein as, 312-313
 doxycycline as, 310-312
 glucosamine and chondroitin sulfate, 352-356
 intra-articular corticosteroid injection as, 308-309
 intra-articular hyaluronan injection as, 280, 309-310
 NSAIDs as, 307-308
 perspective on, 305-307
 tetracyclines as, 310-312
- Study 001, 225-256
- Study of Osteoporotic Fractures (SOF), 32-33
- Subacromial bursitis, 86
- Subchondral bone, in OA, CP3.4, 15, 49-51, 51
 microcracks in, CP4.3, 66-67
 microfractures in, 65-66, 66, 83
 nerve fibers in, 260
 in OA etiopathogenesis, CP4.3, 65-67, 66
 in protecting joint from stress, 59-61
 stiffening of, 65, 68
 thickening of, CP3.4
 viscoelasticity, importance of, 59-61
- Substance P, 259-260
- Sulindac, 184
- Supartz, 271, 280
- Surgical interventions, 319-330
 arthroplasty, 321-324, 323t
 investigative, 324
 joint debridement and lavage, 319-320, 320
 osteotomy, 324-325
 unicompartmental knee arthroplasty, 324
- Swedish Knee Arthroplasty Registry, 322
- Swelling in joint, 17, 47, 81t, 87-88
 due to osteophytes, CP5.1, 83, 87-88
 exercise and, 126
 physical examination of, 102-103
- Swimming, exercise with, 122
- Symptoms of OA, 79-83, 81t
 history of, 102
- Synovial effusions, 87, 107, 108t

Synovial fluid, 107, 108t
 analysis of, 107, 108t
 crystals in, 107
 calcium hydroxyapatite, CP7.4
 calcium pyrophosphate dihydrate, CP7.3
 cholesterol monohydrate, CP7.5
 monosodium urate, CP7.2
 Gram stain of, CP7.6, 87, 107
 gross appearance of, CP7.1, 107
 hyaluronan and, 274-276, 277t
 normal, 108t
 in OA and other common rheumatic diseases, 108t
 Synovial joints. See *Joint(s)*.
 Synovitis, 50-51, 54, 57, 85
 articular cartilage breakdown and, 54-55
 in knee OA, CP3.5
 pain from, 83
 reduction in, may not slow cartilage damage, 300
 Synovium
 in advanced OA, CP3.5, 50-51
 bone/cartilage fragments in, CP3.6, 51, 56
 histologically normal, in OA, CP5.3, 85
 inflammation of, 84t
 Synvisc (Hylan G-F 20), 271
 effectiveness of, 272-274, 273
 side effects of, 282
 Synvisc-One (Hylan G-F), 272, 282
 Systemic lupus erythematosus, 99
 Systemic metabolic abnormalities, 99, 102

TARGET (Therapeutic Arthritis Research and Gastrointestinal Event Trial), 220t, 227
 Tarsal tunnel syndrome, 102
 Temporomandibular OA, 20t
 Tenosynovitis, de Quervain's, 93, 94t
 Tetracyclines, 310-312
 Therapeutic Arthritis Research and Gastrointestinal Event Trial (TARGET), 220t, 227
 Thermal modalities, 131-133, 289
 Thrombosis
 COX inhibitors and, 214, 214t, 219-230, 220t
 deep vein, after arthroplasty, 322
 Thrombosis Prevention Trial, 224
 Thromboxane (TBX) inhibition
 by acetaminophen, 163
 by aspirin, 176, 228
 blocked by ibuprofen, 188
 coxibs and, 210, 211, 213t, 214, 214t, 228-229
 by indomethacin, 181
 by meloxicam, 181

Thumb base, OA of, 81-82, 82
 pain in, 82
 Tiaprofenic acid, 308
 Tibiotalar OA, 20t
 Tidal irrigation of knee, 137-139
 Tidemarks, reduplication of, 49, 50
 Tissue extracts, as SMOADs, 306
 Tissue inhibitor of matrix metalloproteinase (TIMP), 16, 55
 Toe, OA of, CP5.1, 83
 Tolmetin
 COX inhibition by, 179t
 gastrointestinal toxicity of, 178
 Topical capsaicin cream, 259-263
 Topical NSAIDs, 193-199, 259, 291-292
 Total joint arthroplasty, 321-324, 323t
 Tramadol, 246-247
 contraindications, 247
 Tramadol/acetaminophen (Ultracet), 247
 Transaminase elevations, 149
 Transplantation, autologous chondrocyte, 324
 Trauma, OA secondary to, 20t, 30-32, 31t, 57
 Treatment of OA
 acupuncture in, 139-140
 drugs in. See also *Pharmacologic therapy; specific drugs*.
 acetaminophen, 147-170
 COX-2 inhibitors (coxibs), 207-242
 initial pharmacologic therapy, 289-297
 NSAIDs, 171-208
 optimizing therapy, 297-300
 exercise in, 117-128
 injected hyaluronan in, 271-287
 injected steroids in, 265-269
 joint debridement and lavage in, 319-320, 320
 joint fluid aspiration in, 265
 nonpharmacologic therapy, 117-146. See also *specific treatment modalities*.
 for OA pain, strategy for, 289-303
 initial pharmacologic therapy, 289-297
 optimizing therapy for patients taking NSAIDs, 297-300
 patient education in, 139, 289
 surgical interventions, 319-330
 weight loss in, 131
 Triamcinolone acetone, injected, 265, 308-309
 Trochanteric bursitis, 86
 Tumor necrosis factor
 in cartilage breakdown, 55, 56
 hyaluronan and, 274

UK Doctors Study, 224

Ulceration. See also *Gastroenteropathy; Gastrointestinal effects.*
gastric acid suppression and, 176-178
gastrointestinal
acetaminophen and, 160-162, 160
CLASS and VIGOR safety trials of. See *specific trial.*
COX-2 inhibition and, 213-214, 213t, 215-217, 216, 218
NSAIDs and, CP11.1, 160, 173-182
concomitant aspirin use and, 175-177, 177
Helicobacter pylori infection and, 175
risk factors for, 175
in SELECT and MELISSA trials, 180

Ulcerative colitis, 213-214

Ultracet (tramadol/acetaminophen), 247

Ultrasound, 128, 133

Unicompartmental knee arthroplasty, 324

United Kingdom General Practice Research Database, 161

US Physicians Health Study, 224

Valdecoxib
cardiovascular events with, 219, 227
GI complication rate with, 231
withdrawal from market, 291

Valgus braces, 134

Valgus/varus deformities, OA secondary to, 20t

Varus deformity
knee brace for, 134
knee pain with, 59, 126

Varus thrust, 64-65

Varus-valgus malalignment, 64-65, 85

Vasodilators, 185t

Vicodin, 164, 247

VIGOR trial, 181, 182, 215-217, 220t, 229, 233

Vioxx Gastrointestinal Outcome Research (VIGOR) trial, 215-217, 220t, 233
gastrointestinal events in, 181, 182
RA in, 229

Vioxx. See *Rofecoxib.*

Viscoelasticity, of articular cartilage and subchondral bone, 59-61

Vitamin deficiencies/intake, 38-39, 39t

Walker, 126, 289

Walking
energy for, OA and, 120
joint stress in, 126
range of motion requirements for, 129t
speed of, 126
acetaminophen interaction with, 162-163
coxibs and, 163
glucosamine and, 256
NSAIDs and, 175

Wedge insoles, 134-135

Weight loss, 131, 289. See also *Obesity.*
aerobic exercise and, 119
knee OA, benefits for, 131
OA risk reduction with, 33, 133

Western Ontario and McMaster Universities Arthritis index.
See *WOMAC index.*

Wilson's disease, 21t, 99, 102

WOMAC index, 149
acetaminophen therapy, 149
glucosamine therapy, 253
IA corticosteroid injections, 265
IA hyaluronan injections, 281
NSAID therapy, 187, 194
OARSI responders based on, 198t
topical NSAIDs, 194, 195, 196, 197t
total knee replacement, 326t-327t

Women. See *Gender.*

Wrist
de Quervain's tenosynovitis in, 93
OA of, 79, 136
splinting for, 138

