

Index

- A4 *see* androstenedione (A4)
- AAs *see* adrenal androgens (AAs)
- acanthosis nigricans (AN), 31–2, 37, 117, 237
 - as marker, 102
 - and polycystic ovary syndrome, 116
 - symptoms, 116
- acarbose, 345
- N-acetyl-L-cysteine (NAC), 355–6
- acne, 11–12, 31, 102, 103–6
 - clinical features, 104
 - definition, 103
 - incidence, 103
 - management, 14
 - and oral contraceptives, 105
 - pathogenesis, 103
 - and polycystic ovary syndrome, 104
 - treatment, 105
- ACTH *see* adrenocorticotropin (ACTH)
- activin
 - expression, 34
 - neutralization, 34
- acute insulin response to glucose (AIRG), 84
- Adelaide (Australia)
 - depression studies, 134
 - glucose intolerance studies, 127
 - weight loss studies, 129
- adenocarcinomas, 45
- 5'-adenosine monophosphate-activated protein kinase (AMPK)
 - dysregulation, 351
 - roles, 351
- adhesions
 - formation rates, 166, 167
 - post-operative, 166–7
 - rates, 166
 - reduction, 167
- adipocytes
 - defects, 207
 - resistin expression, 351
- adipokynes, secretion, 249
- adiponectin, 123
 - levels, 249
 - roles, 249
- adipose tissue
 - accumulation, 31–2
 - and insulin resistance, 248–50
 - metabolic activity, 122–3
- adiposity, and obesity surgery, 335
- adolescents
 - glucose intolerance, 242
 - hyperandrogenism, 235–9, 243–4, 250–1
 - hypertension, 348
 - menstrual disturbances, 250–1
 - polycystic ovary syndrome, 233–52
 - see also* puberty
- ADRB3 gene, 246
- adrenal androgen excess, 288–9
 - markers, 291
 - limitations, 291–2
 - in polycystic ovary syndrome, 307
 - adrenocortical steroidogenesis, 293–8
 - epidemiology, 289–91
 - ethnic and racial differences, 291
 - prevalence, 289–91
- adrenal androgens (AAs)
 - levels, variability, 305–6
 - secretion, 288–9, 305
 - heritability, 305–7
- adrenal hyperplasia, 45–6
 - congenital, 278
 - see also* non-classical congenital adrenal hyperplasia (NCAH)
- adrenal steroidogenesis
 - extra-adrenal factors, 298–304
 - heritability, 304–7
- adrenarche, 233
 - androgen secretion, 234
 - mechanisms, 247–8
 - physiology, 234–5
- adrenocortical biosynthesis, 291–2
 - abnormalities, 293–4
 - and obesity, 303–4
 - regulatory mechanisms, 301–2
- adrenocortical dysfunction, 294
 - and ovarian abnormalities, 298–9
 - in polycystic ovary syndrome, 288–308

364 Index

- adrenocortical dysfunction (cont.)
 - etiology, 298–9
 - measures, 291–3
 - studies, 301
- adrenocortical hypersecretion, 298
- adrenocortical steroidogenesis
 - changes, 292–3
 - in vivo characterization, 293–8
 - obesity effects on, 303–4
- adrenocorticotropin (ACTH), 307
 - levels, 322–3
 - responses, 305, 307
 - secretion, 234–5
 - stimulation, 291–2, 293, 294, 298, 307–8
 - adrenocortical responses, 299
 - tests, 293–4
- adult-onset diabetes *see* diabetes mellitus
 - type 2 (DM2)
- AFC (antral follicle count), 319–20
- affected relative pair analyses, 33–4
- affected sib pair (ASP) analysis, 34
- African Americans
 - obesity prevalence, 121
 - polycystic ovary syndrome prevalence, 26
 - premature pubarche, 243
- AIRG (acute insulin response to glucose), 84
- alleles
 - and association studies, 32–3
 - class I, 36–7
 - class III, 36–7
- alopecia, 11–12
 - and androgens, 102
 - premature, 13
 - see also* androgenetic alopecia; hair loss
- amenorrhea, 11, 325
- American Diabetes Association, 251
- American Society for Reproductive Medicine (ASRM), 81
 - expert meetings, 288
 - see also* ESHRE/ASRM Rotterdam Consensus (2003)
- AMH (anti-Müllerian hormone), 57–8
- AMPK *see* 5'-adenosine monophosphate-activated protein kinase (AMPK)
- AN *see* acanthosis nigricans (AN)
- anagen, 105–6, 109
- anastrozole, 216
- androgen excess
 - exposure, 263–4, 275
 - fetal programming, 265–6, 269–75, 276–8
 - prevalence, 288
 - see also* adrenal androgen excess
- androgen status
 - and metformin, 69–70
 - efficacy, 70
- androgenetic alopecia, 14, 112–16
 - clinical features, 114–15
 - definition, 112
 - hair patterns, 113
 - incidence, 112
 - pathogenesis, 112–13
 - and polycystic ovary syndrome, 113
 - stages, 114–15
 - treatment, 115–16
 - non-pharmacological, 115
 - pharmacological, 115–16
 - visual scales, 112, 113
 - and weight loss, 115
- androgens
 - biosynthesis, 35–6, 209, 234–5
 - drainage, 170
 - hair growth stimulation, 106
 - hyper-responsiveness, 299
 - inhibition, 34–5
 - levels, 13–14, 167
 - and dieting, 128–9
 - and insulin resistance, 13, 83, 208
 - and pattern hair loss, 102
 - release, 293
 - roles, 234
 - secretion, 6, 13, 234
 - see also* adrenal androgens (AAs); antiandrogens
- Δ^5 -androstene-3 β , 288–9
- androstenedione (A4), 122–3, 288–9
 - biosynthesis, 182, 351
 - levels, 168, 215
 - overproduction, 13
 - response curves, 295, 296
- animal models
 - for polycystic ovary syndrome, 263–4
 - see also* primate models
- animals, and polycystic ovary syndrome, 26
- anovulation, 57–8, 81, 178
 - etiology, 140–1
 - and hyperinsulinemia, 142
 - and insulin resistance, 82–3, 133, 141
 - management, 14–17
 - metformin treatment, 68–9
 - and polycystic ovaries, 31, 42
 - and premature pubarche, 238
 - primate models, 269–72
 - treatment, 1
- anovulatory infertility, 4
- antiandrogens, 251–2
 - in acne treatment, 105
 - therapy, 14
- antibiotics, in acne treatment, 14, 105
- anti-Müllerian hormone (AMH),
 - levels, 57–8

365 Index

- antioxidants
 - and polycystic ovary syndrome, 355–6
 - protective effects, 346
- antiseptics, 105
- antral follicle count (AFC), 319–20
- apocrine glands, 102
- appetite, regulation, 344–5
- aromatase
 - granulosa cell, 182
 - localization, 122–3
- aromatase complex, stimulation, 13
- aromatase inhibitors, ovulation induction, 147, 216
- ASERNIP-S systematic review, 333–4
- Ashkenazi Jews, *CYP21* deficiency, 31
- Asian women
 - polycystic ovary syndrome, 316–27
 - prevalence, 26, 317
- ASP (affected sib pair) analysis, 34
- ASRM *see* American Society for Reproductive Medicine (ASRM)
- association studies, 32–3
 - criticisms, 32–3
 - family based, 33
 - flaws, 33
- atherosclerosis, 94
 - and endothelin-1, 90–1
 - markers, 91, 207
 - premature, 91
 - risk factors, 91, 207
 - treatment, 351
- Atkins diet, 131
- Australia
 - in vitro maturation, 220–1
 - obesity, 86–7
 - prevalence, 121
 - twin studies, 30–1
 - see also* Adelaide (Australia)
- Australian Bureau of Statistics, 121
- autoimmune oophoritis, 45–6
- baldness *see* alopecia
- bariatric surgery *see* obesity surgery
- Barker hypothesis, 239–40, 263–4
 - concepts, 264–5
 - and fetal programming, 264–5
 - issues, 240
 - primate models, predictions, 267–78
 - relevance, to polycystic ovary syndrome, 265
 - see also* fetal programming
- benzyl peroxide, 105
- beta cell function
 - impaired, and diabetes mellitus type 2, 84–6, 274
 - and insulin resistance, 84, 241–2, 251
 - pancreatic, 84–6, 275
- betaine, 349–51
 - biosynthesis, 349
 - occurrence, 349
- betaine-homocysteine methyltransferase (BHMT), 349
- BHMT (betaine-homocysteine methyltransferase), 349
- biguanides, 15
- bilateral ovarian drilling, 164
- biliopancreatic diversion (BPD), 331–2
 - and pregnancy, 338
 - risk factors, 339
 - weight loss, 333–4
- biopsies, and laparoscopy, 159–60
- birth rates, and metformin, 69
- blackheads *see* comedones
- bleaching, hair, 109
- blood pressure (BP)
 - and polycystic ovary syndrome, 89, 243–4
 - see also* hypertension
- BMI *see* body mass index (BMI)
- body mass index (BMI), 180
 - limitations, 122
 - and ovarian stromal blood flow, 319–20
 - ranges, 122
 - reduction, 70–1
- body weight
 - and insulin resistance, 70–1, 82
 - optimal, 344
 - and reproduction, 121–2
 - rhesus monkeys, 268
 - see also* low birth weight; weight loss
- borage oil, 354
- BP *see* blood pressure (BP)
- BPD *see* biliopancreatic diversion (BPD)
- breast cancer, 32
- brewer's yeast, 353
- buserelin, 187
 - outcome studies, 187–8
- calcium
 - as marker, 91
 - supplementation, 353
- Calpain 10* gene, 32–3
- cAMP (cyclic adenosine monophosphate), 186
- carbohydrates, dietary issues, 345
- cardiovascular disease (CVD), 71–3
 - endothelial function assessment, 89
 - markers, 249
 - risk factors, 71, 248
- cardiovascular events, 94
 - long-term health factors, 92–3
 - prevalence, 92–3
- cardiovascular mortality, risk factors, 88

366 Index

- cardiovascular risk factors (CVRFs), 73–4
 - and antioxidants, 356
 - and cardiovascular events, 92
 - prevalence, 89–91, 94
- Caribbean peoples, insulin resistance, 26–7
- β -carotene, 355
- catagen, 105–6
- catechin gallate, 352
 - see also* epigallocatechin gallate (EGCG)
- catechins, 325, 352
- CC *see* clomiphene citrate (CC)
- cells
 - granulosa, 13, 43–5
 - hilus, 45
 - see also* beta cell function; theca cells
- Central Association of Obstetricians and Gynecologists (US), 4
- Chelavite, 353
- chemical depilatories, 109
- children
 - hyperandrogenism, 235–9
 - insulin-like growth factor-1, 235
 - obesity, prevalence, 248
 - polycystic ovaries, 45–6
 - polycystic ovary syndrome, 233–52
 - see also* girls
- Chinese women
 - green tea studies, 325–6
 - ovarian wedge resection effects, 326
 - ovulation induction studies, 323–5
 - polycystic ovary syndrome studies, 317
- D-chiro-inositol, 347
- D-chiro-inositolphosphoglycan (DCI-IPG)
 - deficiency, 208
 - metformin effects, 208
 - regulatory mechanisms, 208
- chlorotrianisene, 14–15
- cholesterol, levels, 88
- chromium, 353
 - and insulin resistance, 353
- chromium–nicotinic acid complexes, 353
- chromosomal abnormalities, and in vitro maturation, 227
- chromosome 19p13.3, 37
- chronic inflammation, prevalence, 89–91
- cinnamon, 352
- clindamycin, 105
- clomiphene citrate (CC), 1, 6–78, 187
 - and body weight, 127
 - early usage, 159
 - and metformin compared, 69
 - outcome studies, 187–8
 - ovulation induction, 145–6, 189, 192–3, 216, 321–3
 - co-treatments, 146
 - with dexamethasone, 146
 - dosage issues, 145
 - with metformin, 142–3
 - studies, 323–5
 - treatment scheme, 146
 - and ovulation rate increase, 133
 - and pregnancy, 145
- closed comedones, 104
- Cochrane Database of Systematic Reviews, 191
- Cochrane meta-analyses, laparoscopic ovarian drilling, 164
- color Doppler, 195–6
 - ovarian stromal blood flow assessment, 318–19
 - polycystic ovary images, 60, 179
 - and power Doppler compared, 58
- comedones, 104
 - treatment, 105
- conception, smoking effects, 134
- congenital abnormalities, and polycystic ovary syndrome, 185–6
- coronary artery, calcium, 91
- cortisol
 - interconversion, 297
 - levels, 306, 322–3
 - response curves, 296
- cortisol metabolism
 - abnormalities, 295–8
 - pathways, 295–7
- cortisone
 - catalysis, 295–7
 - interconversion, 297
- C-reactive protein (CRP), 90–1
- crown pattern hair loss, 11–12
- CRP *see* C-reactive protein (CRP)
- Cushing's syndrome, 141
- CVD *see* cardiovascular disease (CVD)
- CVRFs *see* cardiovascular risk factors (CVRFs)
- cyclic adenosine monophosphate (cAMP), 186
- CYP11A gene, 37
 - polycystic ovary syndrome studies, 36
- CYP17 gene, 32–3, 35–6, 307, 351
 - activity, 238–9
 - encoding, 236
 - polymorphisms, 294
 - regulatory mechanisms, 208, 238
- CYP21 gene
 - encoding, 294
 - mutations, 31, 246, 307
- cyproterone acetate, 14, 105, 110
 - in acne treatment, 105
 - in androgenetic alopecia treatment, 116
 - in hirsutism treatment, 110, 111
- cysts, 104

367 Index

- cytochromes P450, 13
 - 17 α , 13, 208
- cytokines
 - roles, 249
 - secretion, 249
- 2D ultrasonography *see* two-dimensional (2D)
 - ultrasonography
- 3D ultrasonography *see* three-dimensional (3D)
 - ultrasonography
- D19S884* gene, 37
- daidzein, 347
- DCI-IPG *see* D-chiro-inositolphosphoglycan (DCI-IPG)
- dehydroepiandrosterone (DHEA), 113
 - biosynthesis, 234–5
 - levels, 236, 306
 - variability, 305–6
 - response curves, 295, 296
 - secretion, 288–9, 307
 - variability, 307
- dehydroepiandrosterone sulfate (DHEAS), 146
 - as adrenal androgen excess marker, 291
 - limitations, 291–2
 - biosynthesis, 234–5
 - excess, 294
 - extra-adrenal responses, 292–303
 - levels, 289, 298–9, 307–8, 322–3
 - age-associated decline, 291
 - changes, 302
 - circulating, 294, 299, 300–2
 - ethnic and racial differences, 289–91
 - scattergrams, 290
 - as measure of adrenocortical dysfunction, 291–3
 - secretion, 288–9
- dehydroepiandrosterone sulfotransferase (DHEA-ST), 292–3
 - activity, 291, 303
- depression
 - and obesity surgery, 335
 - and polycystic ovary syndrome, 134
- desogestrel, 105, 110
- developed countries, polycystic ovary syndrome prevalence, 26
- dexamethasone, ovulation induction, with clomiphene citrate, 146
- DHA (docosahexaenoic acid), 355
- DHEA *see* dehydroepiandrosterone (DHEA)
- DHEAS *see* dehydroepiandrosterone sulfate (DHEAS)
- DHEA-ST *see* dehydroepiandrosterone sulfotransferase (DHEA-ST)
- DHT *see* dihydrotestosterone (DHT)
- diabetes mellitus, 31–2
 - metformin treatment, 67–8
 - and obesity, 127, 239
 - and polycystic ovary syndrome, 2, 12, 180
 - prevalence, 206–7
 - see also* gestational diabetes mellitus (GDM)
- diabetes mellitus type 2 (DM2), 36, 66, 67–8, 71
 - and endometrial cancer, 93
 - etiology, 274
 - familial correlations, 85–6
 - glycemic control, 347
 - incidence, 262
 - and insulin resistance, 251, 274
 - reduction, 72
 - lipogenesis, 204
 - and magnesium deficiency, 353–4
 - and obesity surgery, 334–5
 - prevalence, 84–5, 185, 206, 262
 - risk factors, 84–6, 94, 206, 239
 - screening, 207
 - thiazolidinedione treatment, 74
- Diane 35ED, 110
- diathermy, 16
 - and electrocauterization, 161
- diazoxide, 75, 208, 300
- diet
 - cross-area studies, 346–7
 - high carbohydrate, 132
 - high protein, 131
 - high fructose, 355
 - hypocaloric, 345
 - interventions, 133
 - issues, 345
 - low fat/moderate protein/high carbohydrate, 131
 - macronutrient composition, 132
 - Mediterranean-style, 346–7
 - and menstruation, 129
 - omnivores, 351
 - and polycystic ovary syndrome treatment, 2, 131–2, 345–7, 354–6
 - soybeans in, 347
 - see also* nutrition
- dietary restriction, and pre-eclampsia, 184–5
- dietary retraining, and menstrual regulation, 130
- dieting, and androgen levels, 128–9
- dihydrotestosterone (DHT), 113
 - and androgenetic alopecia, 113
 - and hirsutism, 106–7
- 17 β -diol, 288–9
- disease, and obesity, 121–2
- dizygotic (DZ) twins, 30
- DM2 *see* diabetes mellitus type 2
- DNA sequences, polymorphisms, 33–4
- docosahexaenoic acid (DHA), 355

368 Index

- Doppler ultrasonography, 354
 - limitations, 60
 - polycystic ovary imaging, 58–60, 179
 - see also* color Doppler; power Doppler; pulsed Doppler
- dyslipidemia, 31–2
 - etiology, 89
 - and menstrual disturbances, 88–9
 - and metabolic syndrome, 72, 350–1
 - metformin effects, 72
 - and obesity surgery, 334–5
 - and polycystic ovary syndrome, 72, 88–9
 - risk factors, 89
 - screening, 209
 - treatment, 350–1
- DZ (dizygotic) twins, 30
- EGCG *see* epigallocatechin gallate (EGCG)
- eicosapentaenoic acid (EPA), 355
- electrocautery (ovaries) *see* ovarian electrocautery
- electrolysis
 - galvanic, 109
 - hair removal, 109
 - thermolysis, 109
- Endocrine Society of Australia (ESA), 75
- endometrial cancer, 81
 - long-term health factors, 93–4
 - and obesity, 93
 - risk factors, 93
- endometriosis, 32
- endometrium, 45
- endothelial dysfunction
 - prevalence, 89–91
 - studies, 89–90
- endothelin-1, as marker, 90–1
- energy expenditure, and weight loss, 345
- environmental factors, 31, 263, 344
- EPA *see* eicosapentaenoic acid (EPA)
- epigallocatechin gallate (EGCG), 325
 - effects on endocrine system, 352
 - studies, 325–6
- epilation, 109
- erythromycin, 105
- ESA (Endocrine Society of Australia), 75
- ESHRE *see* European Society of Human Reproduction and Embryology (ESHRE)
- ESHRE/ASRM Rotterdam Consensus (2003), 1–2, 7, 178–9
 - diagnostic criteria, 9, 25–6, 65, 81, 288, 316
 - and imaging, 48
 - polycystic ovary definition, 49–53
- estradiol, 299
 - levels, 180, 269–70
 - rhesus monkeys, 271
 - 17 β -estradiol, 13
- estrogen
 - extra-adrenal, 299
 - levels, 180, 234
 - metabolism, 122–3
 - protective effects, 90
- estrone, levels, 180
- ethinyl estradiol, 110
- ethnic and racial differences
 - impaired glucose tolerance, 85
 - insulin resistance, 26–7, 321
 - polycystic ovary syndrome, 316–17, 321, 327
 - adrenal androgen excess, 291
 - prevalence, 26–7, 317
 - predisposition, 26–7
 - premature pubarche, 243
- Europe, polycystic ovary syndrome, definition, 316
- European Society of Human Reproduction and Embryology (ESHRE), 81
 - expert meetings, 288
 - see also* ESHRE/ASRM Rotterdam Consensus (2003)
- evening primrose oil, 354
- exercise
 - and menstrual regulation, 130
 - and menstruation, 129
 - and polycystic ovary syndrome treatment, 2
- exercise programs, and lifestyle modification, 129–33
- explosive ovarian response, 182
 - mechanisms, 182
- familial aggregation, 27, 30
- diagnostic criteria, 28
- family studies, 27
 - diagnostic criteria, 27
- fat
 - dietary issues, 346
 - loss of, 345
 - male-pattern accumulation, 350–1
 - peripheral, 345
 - total body, 122
 - see also* adipose tissue; monounsaturated fat; polyunsaturated fat; visceral fat
- fat distribution, 121–2
 - and reproduction, 128
 - sex differences, 122
- fat tissue
 - metabolic activity, 122–3
 - see also* adipose tissue
- fatty acids, 355
 - long-chain polyunsaturated, 346
 - see also* free fatty acids (FFAs)
- FDA (Food and Drug Administration) (US), 73–4
- female pattern hair loss *see* androgenetic alopecia

369 Index

- females
 - hair patterns, 113
 - puberty, physiology, 233–5
 - see also* Asian women; Chinese women; girls
 - Ferriman–Gallwey scale, 107, 108, 317
 - ferritin, 354
 - fertility
 - impaired, primate models, 272–4
 - and polycystic ovary syndrome, issues, 186–8
 - smoking effects, 134
 - see also* infertility
 - Fertility Fitness program, 130
 - fertilization
 - in vitro maturation, 225
 - and luteinizing hormone levels, 186–7
 - see also* in vitro fertilization (IVF)
 - fetal development
 - impaired, 264
 - see also* low birth weight
 - fetal programming
 - and adult disease, 264
 - androgen excess, 265–6, 269–75, 276–8
 - and Barker hypothesis, 264
 - issues, 264–5
 - of polycystic ovary syndrome, 262–78
 - hypotheses, 275–8
 - see also* Barker hypothesis
 - fetal undernutrition, episodic, genetic effects, 264–5
 - fetus, smoking effects on, 134–5
 - FFAs *see* free fatty acids (FFAs)
 - FI (flow index), 318–19, 322
 - fiber, dietary, 345
 - fibrinogen, 353
 - fibroblasts, defects, 207–8
 - finasteride, 251–2
 - in androgenetic alopecia treatment, 116
 - in hirsutism treatment, 112
 - Finland, 265
 - flow index (FI), 318–19, 322
 - flutamide, 251–2
 - in hirsutism treatment, 112
 - in hyperandrogenism treatment, 14
 - FNPO *see* follicle number per ovary (FNPO)
 - folate, levels, 349
 - folic acid, 347–51
 - activity, 349
 - follicle number per ovary (FNPO)
 - issues, 53
 - threshold, 51
 - ultrasound studies, 57–8
 - follicle numbers
 - consensus definition, 51
 - counting, 49
 - increased, 51–3
 - in polycystic ovary syndrome, 57
 - follicle stimulating hormone (FSH), 182
 - activity, 13, 141
 - concentrations, 319–20
 - diversion, 183
 - in in vitro maturation, 222
 - levels, 6–7, 215, 234
 - ovulation induction, 145–50, 147–50, 189
 - dosage issues, 148
 - with gonadotropin-releasing hormone agonists, 151
 - with gonadotropin-releasing hormone antagonists, 151–2
 - issues, 190
 - meta-analyses, 190
 - with metformin, 143
 - step-down dose regimen, 149
 - step-up dose regimen, 149–50
 - studies, 148–9
 - recombinant, 190–1
 - reduction, 34
 - sensitivities, in polycystic ovaries, 147
 - see also* recombinant human follicle stimulating hormone (rhFSH)
- follicles
 - abnormalities, 57–8
 - antral, 43–5
 - cystic, 43–5
 - differentiation, abnormalities, 273–4
 - distribution, 55, 56–7
 - graafian, 43–5
 - imaging, 49
 - primary, 43–5
 - secondary, 43–5
 - tertiary, 43–5
 - see also* hair follicles
- follicular hyperthecosis, use of term, 43–5
- folliculitis, 109
- follicle-stimulating hormone, 34–5
 - expression, 34
 - overexpression, 34
- follicle-stimulating hormone gene, 34–5, 37
- Food and Drug Administration (FDA) (US), 73–4
- free fatty acids (FFAs), 207–8
 - levels, 346
 - in peripheral fat, 345
 - protective effects, 346
- frequently sampled intravenous glucose tolerance test (FSIVGTT), 301
 - insulin-modified, 301
- FSH *see* follicle stimulating hormone (FSH)
- FSIVGTT *see* frequently sampled intravenous glucose tolerance test (FSIVGTT)
- gadolinium injections, 59, 61
- gastric stapling, 129

370 Index

- gastrojejunal anastomosis, 129
- GDM *see* gestational diabetes mellitus (GDM)
- genes
 - in gonadotropin activity, 34–6
 - in insulin activity, 36–7
- genetic analyses
 - association studies, 32–3
 - family based, 33
 - issues, 34
 - linkage analysis, 33–4
 - modes, 32–4
- genetic predisposition, 13
- genetic studies, issues, 25–6
- genetics, polycystic ovary syndrome, 245–6, 263, 344
- genistein, 347
- genotypes, 25–38
 - sex differences, 26
- germinal vesicle breakdown (GVBD), 217–18, 224
 - schematic, 219
- gestational diabetes mellitus (GDM), 184
 - incidence, 69
 - and insulin resistance, 71
 - metformin treatment, 69
 - and polycystic ovaries, 85
 - and polycystic ovary syndrome, 317
 - prevalence, 85, 185
 - risk factors, 127
- GH *see* growth hormone (GH)
- ghrelin, 123, 344–5
- GI *see* glycemic index (GI)
- girls
 - hyperandrogenism, 250–2
 - polycystic ovaries, prevalence, 245
 - polycystic ovary syndrome, onset, 237–8
- GLA (γ -linolenic acid), 355
- glitazones, 75, 133, 144
- glucocorticoid receptor (GRL), 307
- glucocorticoids, release, 293
- glucoregulatory dysfunctions, 266–7
 - predictors, 267–8
- glucose, uptake inhibition, 345
- glucose intolerance, 31–2, 300
 - adolescents, 242
 - age of onset, 85
 - and obesity, 127
 - prevalence, 85, 206–7, 239
 - screening, 185, 207, 209, 243, 251
 - studies, 127
 - see also* impaired glucose tolerance (IGT)
- glucose/insulin axis, abnormalities, 300–3
- glucose-mediated glucose disposal, 301
- GLUT-4 transporter, stimulation, 204
- glycemic index (GI), 131
 - definition, 132
 - low, 132
- glycetin, 347
- GnRH *see* gonadotropin releasing hormone (GnRH)
- GnRH agonists *see* gonadotropin releasing hormone (GnRH) agonists
- GnRH antagonists *see* gonadotropin releasing hormone (GnRH) antagonists
- GnRHa (gonadotropin releasing hormone analogs), 15
- gonadal axis, physiology, 234
- gonadal steroids, roles, 298–9
- gonadarche, 233
 - physiology, 234
- gonadectomy, 299
- gonadotrophins *see* gonadotropins
- gonadotropin therapy
 - economic evaluation, 171
 - and laparoscopy compared, 172
- gonadotropin reducing drugs, 123
- gonadotropin releasing hormone (GnRH), 234, 270–2
 - analog stimulation, 240–1
 - ovarian suppression, 298–9
 - secretion, 234
- gonadotropin releasing hormone (GnRH) agonists, 187–8, 191–2
 - co-treatment issues, 150–1
 - ovulation induction, 150–1
 - with follicle stimulating hormone, 151
- gonadotropin releasing hormone (GnRH) antagonists, 188
 - advantages, 151–2, 191–2
 - ovulation induction, 151–2, 191
 - with follicle stimulating hormone, 151
- gonadotropin releasing hormone analogs (GnRHa), 15
- gonadotropins, 14–15, 68, 127
 - activity, genes in, 34–6
 - in anovulation management, 15
 - human pituitary, 1
 - ovulation induction, 147–50, 323
 - regulatory mechanisms, genes in, 34–6
 - roles, 244–5
 - secretion, 6, 34
 - stimulation, 162
 - see also* follicle stimulating hormone (FSH); human chorionic gonadotropin (hCG); human menopausal gonadotropin (hMG); luteinizing hormone (LH)
- granulosa cell aromatase, 182
- granulosa cells, 13, 43–5

371 Index

- Greece, 26
- green tea
 - benefits, 325, 352
 - studies, 325–6
- GRL (glucocorticoid receptor), 307
- GRL gene, 246
- growth
 - intrauterine catch-up, 267–8
 - intrauterine retardation, 263–4
- growth abnormalities, primate models, 267–78
- growth hormone (GH)
 - activation, 234
 - roles, 244–5
- Guar gum, 345
- GVBD *see* germinal vesicle breakdown (GVBD)
- hair
 - bleaching, 109
 - vellus, 105, 106
 - see also* terminal hairs
- hair follicles, 102
- hair physiology, 105–6
- hair growth
 - cyclical, 105–6
 - phases, 105–6
 - stimulation, 106
 - synchronized, 106
- hair loss
 - crown pattern, 11–12
 - diffuse, 114–15
 - mid-frontal scalp, 114–15
 - see also* alopecia
- hair patterns, females, 113
- hair removal
 - chemical depilatories, 109
 - electrolysis, 109
 - epilation, 109
 - lasers, 109
 - physical methods, 107–9
 - shaving, 109
- HAIR-AN syndrome, use of term, 116
- Harris–Benedict equation, 345
- hCG *see* human chorionic gonadotropin (hCG)
- hCRH (human corticotropin-releasing hormone), 322–3
- HDL *see* high-density lipoprotein (HDL)
- herbal medicines
 - future research, 326
 - ovulation induction, 325–6
- high-density lipoprotein (HDL), 345, 347
 - levels, 88, 89, 354
 - polyphenol effects, 352
 - protective effects, 90
 - reduction, 72
- hilus cells, 45
- hirsutism, 11–12, 25–6, 31, 88–9, 102, 106–12
 - clinical features, 107
 - definition, 106
 - differential diagnosis, 107
 - etiology, 4
 - grading scales, 107, 108
 - hair removal methods, physical, 107–9
 - incidence, 106
 - management, 14
 - metformin treatment, 70
 - and obesity, 325
 - pathogenesis, 106–7
 - and polycystic ovary syndrome, 107
 - and premature pubarche, 236
 - treatment, 107–12
 - pharmacological, 110–12
 - psychological, 107–10
 - and weight loss, 109–10
- Hispanics
 - insulin resistance, 26–7
 - obesity, prevalence, 121
 - premature pubarche, 243
- hMG *see* human menopausal gonadotropin (hMG)
- HMs (homocysteine modulators), 350
- HOMA-IR (homeostasis model assessment of insulin resistance), 205–6
- homeostasis model assessment of insulin resistance (HOMA-IR), 205–6
- homocysteine (Hcy), 347–51
 - accumulation, 347–9
 - levels, 349
 - metabolism, 349
 - reduction, 349
 - studies, 349
- homocysteine modulators (HMs), 349
- homocysteinemia, etiology, 347–9, 348
- Hong Kong, 324–5
- hormonal characteristics, polycystic ovary syndrome, 317–21
- HPA (hypothalamic–pituitary–adrenal) axis, 294
- HPG (human pituitary gonadotropin), 1
- 17-HPREG *see* 17-hydroxypregnenolone (17-HPREG)
- HSA (human serum albumin), 220
- 3 β -HSD (3 β -hydroxysteroid dehydrogenase), 234–5
- 11 β -HSD *see* 11 β -hydroxysteroid dehydrogenase (11 β -HSD)
- HSD3B2 gene, 246
- human chorionic gonadotropin (hCG), 183, 195–6, 217–18
 - pre-retrieval priming, 221
 - see also* recombinant human chorionic gonadotropin (rhCG)

372 Index

- human corticotropin releasing hormone (hCRH), responses, 322–3
- human menopausal gonadotropin (hMG), 183, 187
 - outcome studies, 187–8
 - ovulation induction, 189
 - issues, 190
 - meta-analyses, 190
- human pituitary gonadotropin (HPG), 1
- human serum albumin (HSA), 220
- hydrocoagulation, transvaginal
 - ultrasound-guided, 216
- hydrogen peroxide, 109
- 11 β -hydroxyandrostenedione (11-OHA4), 288–9
 - levels, 289
- 17-hydroxylase
 - activity, 234–5, 275
 - catalysis, 13
 - encoding, 35–6, 236
- 17 α -hydroxylase, activity, 234
- 21-hydroxylase (21-OH), deficiency, 140–1, 278, 292
- 17-hydroxypregnenolone (17-HPREG), 291–2
 - levels, 234–5, 301
- 17-hydroxyprogesterone, 140–1
 - ovarian hyperresponse, 240–1
- 3 β -hydroxysteroid dehydrogenase (3 β -HSD),
 - expression, 234–5
- 11 β -hydroxysteroid dehydrogenase (11 β -HSD), 295–7
 - expression, 297–8
 - isoforms, 297
- hyperandrogenemia, 27, 37, 81
 - and insulin resistance, 83
- hyperandrogenic chronic anovulation, 25–6
- hyperandrogenism, 25–6, 27, 140, 178, 185
 - adolescents, 235–9, 243–4, 250–1
 - age differences, 236
 - children, 235–9
 - development, 244–5
 - functional ovarian, 238
 - girls, 250–2
 - and hyperinsulinemia, 193, 300–1, 323
 - males, 275
 - ovarian, 269–70, 277
 - and polycystic ovaries, 31, 179
 - and polycystic ovary syndrome, 237–9, 288
 - and premature pubarche, 236
 - prenatal origin, 239
 - primate models, 269–72, 278
 - stigmata, 16
 - studies, 300–1
 - symptoms, 69, 324–5
 - treatment, 14
 - metformin, 15, 70, 142
- hyperglycemia, 15, 81–2
 - and endometrial cancer, 93
 - treatment, 142
- hyperinsulinemia, 66, 81, 141, 185, 216–17
 - and anovulation, 142
 - etiology, 83, 133
 - familial correlations, 85–6
 - and hyperandrogenism, 193, 300–1, 323
 - and insulin resistance, 300
 - long-term health factors, 82–3
 - mechanisms, 300
 - prevalence, 27, 86
 - risk factors, 184
- hyperinsulinemic insulin resistance and polycystic ovary syndrome, 204–9
 - roles, 204
 - see also* insulin resistance
- hyperinsulinism, 57–8
 - management, for ovulation induction, 141
- hyperkeratosis, 116
- hyperlipidemia, long-term health factors, 88–9
- hyperpigmentation, 109
- hyperplasia, 45
 - thecal, 182
 - see also* adrenal hyperplasia
- hyperprolactinemia, 11
 - etiology, 180
- hypertension, 184
 - adolescents, 349
 - and endometrial cancer, 93
 - and metabolic syndrome, 81–2
 - and obesity surgery, 334–5
 - and polycystic ovary syndrome, 71
 - prevalence, 89
- hypertrichosis, 107
 - see also* hirsutism
- hypertriglyceridemia, 81–2
- hypopituitary hypogonadism, 195
- hypothalamic–pituitary–adrenal (HPA)
 - axis, sensitivity, 294
- hypothyroidism, 45–6
- IBD (identity by descent), 34
- ICSI (intracytoplasmic sperm injection), 225
- identity by descent (IBD), 34
- IGF-1 *see* insulin-like growth factor-1 (IGF-1)
- IGFBPs *see* insulin-like growth factor binding proteins (IGFBPs)
- IGT *see* impaired glucose tolerance (IGT)
- IL-6 *see* interleukin-6 (IL-6)
- imaging
 - polycystic ovaries, 48–62
 - ultrasound, 8
 - see also* magnetic resonance imaging (MRI); ultrasound

373 Index

- impaired glucose tolerance (IGT), 66, 71
 - ethnic and racial differences, 85
 - prevalence, 84–5
 - treatment, 67–8
 - see also* glucose intolerance
- IMT *see* intima-media thickness (IMT)
- in vitro fertilization (IVF), 68, 217
 - indications, 177
 - and insulin resistance, 192–3
 - luteal support, 195–6
 - metformin in, 143
 - and miscarriage, 186–8
 - and obesity, 128, 192–3
 - outcome studies, 187–8
 - lack of, 227
 - ovarian hyperstimulation, 272, 273
 - and ovarian hyperstimulation syndrome, 195–6
 - and polycystic ovaries, 177–96
 - issues, 196
 - outcome studies, 183–4
 - prevalence, 181
 - stimulation responses, 182–4
 - and polycystic ovary syndrome, 177–96
 - issues, 196
 - prevalence, 181
 - preconception counseling, 184–6
- in vitro fertilization/embryo transfer (IVF/ET), 154
- in vitro maturation (IVM), 217–28
 - advantages, 228
 - chromosomal abnormalities, 227
 - clinical applications, 220–3
 - cost factors, 226–7
 - cycle initiation, 223
 - disadvantages, 226–7
 - early studies, 220–1
 - embryo transfer, 225–6
 - endometrial preparation, 226
 - in fertility treatment, 220–1
 - fertilization, 225
 - immature oocyte retrieval, 223
 - indications, 222–3
 - luteal support, 226
 - maturation rates, 220
 - oocytes, 194–5, 223–5
 - priming
 - with follicle stimulating hormone, 222
 - pre-retrieval, 221
 - procedures, 223–6
 - success rates, 227
- India, 317, 321
- infertility
 - anovulatory, 4
 - etiology, 186
 - and genetic studies, 25–6
 - and obesity, 87, 125–6, 262
 - studies, 125–6
 - in polycystic ovary syndrome, 317
 - laparoscopy, 159–72
 - treatment, 220–1
 - treatment response, and obesity, 127–8
 - weight loss effects, 128–9
- inhibin
 - drainage, 170
 - roles, 168
- inositol, dietary issues, 347
- INS gene, 343–4
- insulin
 - activity, genes in, 36–7
 - fasting levels, 300–1, 302
 - roles, 303
 - serum levels, 243
 - signaling pathways, 204, 205
 - stimulatory mechanisms, 238–9
 - suppression, 300
- insulin gene, 36–7
- insulin receptor, 37
 - mutations, 37
- insulin resistance, 300
 - and adipose tissue, 248–50
 - amelioration, 66–7, 274
 - and androgen levels, 13, 83, 208
 - and anovulation, 82–3, 133, 141
 - and beta cell function, 84, 241–2, 251
 - and body weight, 70–1, 82
 - and chromium deficiency, 353
 - definition, 204
 - and diabetes mellitus type 2, 251, 274
 - diagnostic criteria, 206
 - ethnic and racial differences, 26–7, 321
 - etiology, 37, 83
 - as familial trait, 31
 - and gestational diabetes mellitus, 71
 - and hyperandrogenemia, 83
 - and hyperinsulinemia, 300
 - and in vitro fertilization, 192–3
 - inheritance, 205–6
 - long-term health factors, 82–3
 - and low birth weight, 267
 - and magnesium deficiency, 352–3
 - mechanisms, 82
 - and menstrual disturbances, 82–3
 - metformin-induced reduction, 71–2, 274
 - and diabetes mellitus type 2, 72
 - nutritional issues, 347–51
 - nutritional modification, 344–5
 - and obesity surgery, 335
 - ovarian wedge resection effects, 326
 - and oxidative stress, 354–5
 - and platelet aggregation, 354

374 Index

- insulin resistance (cont.)
 - and polycystic ovaries, 185
 - and polycystic ovary syndrome, 25–6, 36, 71–2, 81, 204–9
 - cellular mechanisms, 207–9
 - epidemiology, 204–7
 - issues, 65–7, 182
 - markers, 12
 - nutritional issues, 344–5
 - prevalence, 13–14, 82–3, 141, 238, 241
 - roles, 204
 - screening issues, 209
 - and premature pubarche, 240–4
 - prevalence, 27
 - in puberty, 235
 - syndrome, 206
 - and weight loss, 82, 133–4, 335–6
 - see also* hyperinsulinemic insulin resistance
- insulin sensitivity, restoration, 133–4
- insulin sensitizers (ISs), 216–17
 - and dietary interventions, 133
 - limitations, 67
 - ovulation induction, 323–5
 - in polycystic ovary syndrome treatment, 65–75
 - trials, 67
- insulin/insulin-like growth factor-1 hypothesis, 247, 248
- insulin-like growth factor binding proteins (IGFBPs)
 - activity, 351
 - binding, 235
 - decrease, 234, 244
 - levels, 242–3
- insulin-like growth factor-1 (IGF-1), 106, 185, 335
 - activation, 234
 - androgen biosynthesis stimulation, 209
 - in children, 235
 - levels, 13
 - in puberty, 235
 - roles, 244–5
- interleukin-6 (IL-6)
 - levels, 249
 - roles, 249
- intima media thickness (IMT), 207
 - increased, 91
- intracytoplasmic sperm injection (ICSI), 225
- intrafollicular steroidogenesis, abnormalities, 272–3
- intrauterine insemination (IUI), 127, 145
- intravenous glucose tolerance test (IVGTT), 84
- Iowa Women’s Health Study, 128
- iron deficiency, 338
- IRS-1* gene, 32–3, 246
 - R972 variant, 246
- isotretinoin, in acne treatment, 105
- ISs *see* insulin sensitizers (ISs)
- Italy
 - dietary studies, 346–7
 - polycystic ovary syndrome, 321
 - weight loss studies, 129
- IUI (intrauterine insemination), 127, 145
- IVF *see* in vitro fertilization (IVF)
- IVF/ET (in vitro fertilization/embryo transfer), 154
- IVGTT (intravenous glucose tolerance test), 84
- IVM *see* in vitro maturation (IVM)
- Japan, 321
- keratolytics, 105
- Korea
 - dietary studies, 347
 - in vitro maturation, 220–1
- lactic acidosis, 73
 - metformin-induced, 73
- LAGB *see* laparoscopic adjustable gastric banding (LAGB)
- lamin A/C gene, mutations, 31–2
- laparoscopic adjustable gastric banding (LAGB), 331–2
 - adjustability, 332
 - outcome studies, 336, 337
 - and pregnancy, 338
 - risk factors, 339
 - weight loss, 333–4
- laparoscopic laser drilling, 163
 - laser types, 163
 - techniques, 163
- laparoscopic multielectrocauterization, 160–3
 - early studies, 160–1
- laparoscopic ovarian drilling (LOD), 152–3, 162, 163, 216
 - advantages, 152–3
 - bilateral, 162, 164
 - economic evaluation, 171
 - effects on ovarian blood flow, 170
 - meta-analyses, 164
 - and metformin therapy compared, 172
 - ovulation induction, 326
 - postoperative adhesions, 166–7
 - randomized controlled trials, 164
 - repeated, issues, 171
 - studies, 152, 162–3
 - via transvaginal hydrolaparoscopy, 164
 - treatment scheme, 153
 - unilateral, 162
 - see also* ovarian electrocautery
- laparoscopy, 1
 - development, 159
 - electrocautery, 159–64

375 **Index**

- biopsies, 159–60
- multipunctures, 160–3
- and gonadotropin therapy compared, 172
- infertility treatment
 - advantages, 171
 - adverse effects, 172
 - complications, 166–7
 - disadvantages, 172
 - indications, 172
 - issues, 171
 - in polycystic ovary syndrome, 159–72
 - results, 165
 - techniques, 159–64
- and ovarian wedge resection compared, 171
- polycystic ovary studies, 7
- in polycystic ovary syndrome management
 - comparisons, 165
 - trials, 16
- post-operative adhesions, 166–7
- procedures, mode of action, 167–71
- randomized controlled trials, 164
- techniques, 159–64
- laparotomy, 6, 216
- lasers, in hair removal, 109
- late-onset congenital adrenal hyperplasia (NCAH)
 - see non-classical congenital adrenal hyperplasia (NCAH)
- Latinos *see* Hispanics
- LDL *see* low-density lipoprotein (LDL)
- leptin, 123
 - increased levels, 123, 134
 - levels, 249
 - roles, 123, 249
- letrozole, 147, 216
- leuprolide, 275
- Leventhal, M.L., 4, 6, 42
- levonorgestrel, 110
- LH *see* luteinizing hormone (LH)
- LHRH (luteinizing hormone releasing hormone), 183
- lifestyle factors, in etiology and management of polycystic ovary syndrome, 121–30
- lifestyle modification, 66–7, 75
 - weight loss and exercise programs, 129–33
- linkage analyses, 33–4, 37
 - model-based, 34
 - non-model-based, 34
- γ -linolenic acid (GLA), 355
- linolenic acids, sources, 346
- lipid abnormalities, 88
- lipids
 - peroxidation, 355
 - and polycystic ovary syndrome, 72
 - regulatory mechanisms, 351
- lipogenesis, in diabetes mellitus type 2, 204
- α -lipoic acid, 355
- lipotoxicity hypothesis, 249
- liver disease, and obesity surgery, 335
- LOD *see* laparoscopic ovarian drilling (LOD)
- low birth weight
 - etiology, 264
 - and insulin resistance, 267
 - and metabolic syndrome, 343
 - and obesity, 267
 - and polycystic ovaries, 343
 - rhesus monkeys, 265–6
 - risk factors, 264
- low-density lipoprotein (LDL), 345, 347
 - levels, 88–9
 - polyphenol effects, 352
 - reduction, 72
- luteal support
 - in vitro fertilization, 195–6
 - in vitro maturation, 226
- luteinizing hormone (LH)
 - concentrations, 141, 319–20
 - reduction, 150–2
 - hypersecretion, 12, 13, 34, 180, 186, 270–2
 - levels, 6–7, 167
 - elevated, 215, 234
 - and fertilization, 186–7
 - and ovulation induction, 190
 - secretion, 234, 244–5
 - and weight loss, 134
- luteinizing hormone releasing hormone (LHRH), 183
- 17,20-lyase
 - activity, 234–5
 - encoding, 35–6, 236
- magnesium, 352–3
 - deficiency, 352–3
- magnetic resonance imaging (MRI)
 - after gadolinium injection, 59
 - limitations, 61
 - polycystic ovary imaging, 60–1
- males
 - fetal programming studies, 266–7
 - hyperandrogenism, 275
 - metabolic abnormalities, 275
- malnutrition, genetic effects, 264–5
- MAP (mitogen-activated protein) kinase, 208
- markers, 37, 102
 - for adrenal androgen excess, 291, 292
 - for atherosclerosis, 91, 207
 - calcium as, 91
 - for cardiovascular disease, 249
 - endothelin-1, 90–1
 - genetic, 343–4
 - ovarian, 317

376 Index

- markers (cont.)
 - for polycystic ovary syndrome, 2, 343–4
 - surrogate, 2
- Marvelon, 110
- Mediterranean peoples
 - glucose intolerance, 85
 - obesity, 86–7
- Mediterranean-style (MS) diet, studies, 346–7
- MEDLINE, 4
- meiosis, 217, 218
- MEK (methyl ethyl ketone), 208
- men *see* males
- menarche, 234
 - delayed, 267
 - early, 236
- Mendelian disorders, 31–2
- menstrual bleeding, 11
- menstrual disturbances, 4, 11, 185
 - adolescents, 250–1
 - and dyslipidemia, 88–9
 - and insulin resistance, 82–3
 - and obesity, 87, 123–5
 - risk factors, 94
 - and waist/hip ratio, 128
 - weight-related, 133–4
- menstrual regulation
 - dietary retraining, 130
 - and exercise, 130
 - metformin in, 68
- menstruation
 - cyclicity restitution, 169
 - and diet, 129
 - and exercise, 129
 - weight loss effects, 128–9
- metabolic abnormalities, 275
 - primate models, 267–78
 - males, 275
- metabolic characteristics
 - obesity-related, and weight loss, 334–5
 - polycystic ovary syndrome, 320, 321, 343
- metabolic dysfunction, in polycystic ovary syndrome, 262–3
- metabolic symptomatology, of polycystic ovary syndrome, 12
- metabolic syndrome, 71–3, 249, 251, 334, 348
 - diagnostic criteria, 81–2
 - and dyslipidemia, 72, 350–1
 - and low birth weight, 343
 - and obesity surgery, 335
 - vitamin status, 355
- metformin, 2
 - advantages, 75
 - and androgen status, 69–70
 - applications, 68
 - and birth rates, 69
 - and clomiphene citrate compared, 69
 - in diabetes mellitus treatment, 67–8
 - disadvantages, 75
 - effects
 - on dyslipidemia, 72
 - on homocysteine, 350
 - on D-chiro-inositolphosphoglycan, 208
 - on testosterone biosynthesis, 208
 - efficacy, 251
 - hirsutism treatment, 70
 - hyperandrogenism treatment, 15, 70, 142
 - in in vitro fertilization, 143
 - infertility treatment, 172
 - insulin resistance reduction, 71–2, 274
 - mechanisms, 67–8
 - menstrual regulation, 68
 - ovulation induction, 15, 68–9, 142–4, 192–3, 323
 - with clomiphene citrate, 142–3
 - dosage issues, 142
 - with follicle stimulating hormone, 143
 - reviews, 144
 - studies, 323–5
 - and ovulation rate increase, 133
 - in polycystic ovary syndrome treatment, 67–71, 75, 216–17, 251
 - issues, 144
 - studies, 302–3
 - and pregnancy, 69, 144
 - safety issues, 75
 - side effects, 72–3
 - teratogenicity, 73
 - trials, 67
 - and weight loss, 70–1
- metformin therapy, and laparoscopic ovarian drilling compared, 172
- methionine, 347–9
- methyl ethyl ketone (MEK), 208
- 5,10-methylenetetrahydrofolate reductase (MTHFR), 349
- methyl-D-chiro-inositol, 347
- metoclopramide, 169
- MFOs *see* multifollicular ovaries (MFOs)
- minerals, and polycystic ovary syndrome, 353
- minilaparoscopy, 164
- minoxidil, in androgenetic alopecia treatment, 115
- miscarriage
 - and in vitro fertilization, 186–8
 - and obesity, 126
 - recurrent, 12
 - risk factors, 192
- mitogen-activated protein (MAP) kinase, 208
- monofolliculogenesis, 167–8
- monounsaturated fat, 346
 - sources, 346
- monozygotic (MZ) twins, 30

377 Index

- MRI *see* magnetic resonance imaging (MRI)
MS (Mediterranean-style) diet, 346–7
MTHFR (5,10-methylenetetrahydrofolate reductase), 349
multicystic ovaries, differential diagnosis, 178
multifollicular ovaries (MFOs)
 definitional issues, 51–3
 and polycystic ovaries compared, 53, 54
 polyfollicular ovaries, 269
 and puberty, 245
multiple laparoscopic biopsies, 162
multiple punch resection cautery, 161
myocardial infarction, risk factors, 92
myricetin, 352
MZ (monozygotic) twins, 30
- NAC (*N*-acetyl-L-cysteine), 355–6
NADPH (5,10-methylenetetrahydrofolate reductase), 349
nafarelin, 238
naloxone, 169
National Cholesterol Education Program Third Consensus Report (NCEP ATP III), 206
National Diabetes Data Group (US), criteria, 206–7
National Health and Nutrition Examination Survey (NHANES), 206
National Institute of Child Health and Human Development (NICHD) (US), 25–6
 diagnostic criteria, 288
National Institutes of Health (NIH) (US), 9, 25–6
 diagnostic criteria, 65, 237
 obesity guidelines, 135
National Institutes of Health–National Institute of Child Health and Human Development (NIH–NICHD), diagnostic criteria, 237
NCAH *see* non-classical congenital adrenal hyperplasia (NCAH)
NCEP ATP III (National Cholesterol Education Program Third Consensus Report), 206
Netherlands, the, 265
NHANES (National Health and Nutrition Examination Survey), 206
niacin, 350–1
niacin–statin supplementation, 351
NICHD *see* National Institute of Child Health and Human Development (NICHD) (US)
nicotinamide, 350–1
nicotinic acid, 350–1
NIDDM *see* diabetes mellitus type 2 (DM2)
NIH *see* National Institutes of Health (NIH) (US)
NIH–NICHD (National Institutes of Health–National Institute of Child Health and Human Development), 237
nodules, 104
non-classical congenital adrenal hyperplasia (NCAH), 31
 21-hydroxylase deficiency, 292
non-insulin-dependent diabetes mellitus (NIDDM) *see* diabetes mellitus type 2 (DM2)
norethisterone, 105, 110
normocalcemia, 353
nuclear receptors, and nutrition, 351
Nurses’ Health Study (US), 125, 355
nutrition
 and insulin resistance, 344–5, 347–51
 and nuclear receptors, 351
 and polycystic ovary syndrome, 343–57
 pathogenesis, 343–4
 surgical issues, 338
 see also diet
ob gene, 123
obesity,
 and adrenocortical biosynthesis, 303–4
 comorbidity, 121–2, 325, 331
 and diabetes mellitus, 127, 239
 and disease, 121–2
 effects on adrenocortical steroidogenesis, 303–4
 and endometrial cancer, 93
 glucose intolerance, 71
 and in vitro fertilization, 128, 192–3
 indices, 122
 and infertility, 87, 125–6, 262
 studies, 125–6
 long-term health factors, 86–8, 94
 long-term treatment guidelines, 135
 and low birth weight, 267
 and metabolic syndrome, 81–2
 and polycystic ovary syndrome, 2, 12, 13–14, 16–17, 331
 etiology, 87
 and glucose intolerance, 127
 and infertility, 125–6
 and infertility treatment response, 127–8
 and menstrual disturbances, 123–5
 and miscarriage, 126
 and pregnancy, 126
 prevalence, 86–7, 205
 risk factors, 180, 325
predictors, 267–8
and pregnancy, 125
 risk factors, 185
 studies, 125
prevalence, 86, 121, 262
 children, 248
 cross-national differences, 86–7
reproductive effects, 87, 124
risk factors, 248

378 Index

- obesity (cont.)
 - and weight loss, 87
 - metabolic factors, 334–5
- obesity surgery
 - advantages, 331, 334–5, 339
 - complications, 338
 - follow-up programs, 335–6
 - malabsorptive, 331–2
 - mechanisms of action, 331–2
 - and polycystic ovary syndrome, 331–9
 - outcome studies, 336
 - and pregnancy, 337–8
 - outcome studies, 338
 - restrictive, 331–2
 - risk factors, 338–9
 - and weight loss, 332, 333–4
 - reviews, 333–4
 - see also* biliopancreatic diversion (BPD); laparoscopic adjustable gastric banding (LAGB); Roux-en-Y gastric bypass (RYGB)
- OCPs *see* oral contraceptives
- oCRH *see* ovine corticotropin releasing hormone (oCRH)
- 21-OH *see* 21-hydroxylase (21-OH)
- 11-OHA4 *see* 11 β -hydroxyandrostenedione (11-OHA4)
- OHSS *see* ovarian hyperstimulation syndrome (OHSS)
- oligomenorrhea, 11, 25–6, 27, 31, 238
 - comorbidity, 179
 - lipid levels, 88–9
 - risk factors, 85
- omega-3, benefits, 354
- OMI (oocyte maturation inhibitor), 186
- omnivores, diet, 351
- oocyte maturation, 218
 - abnormalities, 273–4
 - in vitro, 219–20
 - from polycystic ovaries, 220
 - from unstimulated ovaries, 219–20
 - in vivo
 - control, 217–19
 - initiation, 217–19
- oocyte maturation inhibitor (OMI), 186
- oocytes
 - evaluation, 223–5
 - immature, 222, 224
 - in vitro maturation, 194–5, 223–5
 - metaphase II, 217, 225
 - optimum number, 189
 - reduced quality, 272
 - transvaginal ultrasound-guided collection, 223
- oophorectomy, 7
- oral contraceptives, 14, 123
 - and acne, 105
 - in hirsutism treatment, 110
 - in polycystic ovary syndrome treatment, 67, 251–2
 - risk factors, 66
- ovarian abnormalities
 - and adrenocortical dysfunction, 298–9
 - intrinsic, 270–2
- ovarian area, 54–6
 - determination, 49
- ovarian biopsies, 159–60
 - complications, 160
 - early studies, 159–60
- ovarian biopsy forceps, 159
- ovarian diathermy *see* laparoscopic ovarian drilling (LOD)
- ovarian electrocautery, 159–64
 - biopsies, 159–60
 - and diathermy, 161
 - gonadotrophic stimulation, 162
 - hypotheses, 170
 - multipunctures, 160–3
 - monopolar forceps, 161
 - scissors, 161
 - pregnancy rates, 161–3
 - ten points, 162
 - see also* laparoscopic ovarian drilling (LOD)
- ovarian function, abnormalities, 270
- ovarian hyperstimulation, in in vitro fertilization, 272, 273
- ovarian hyperstimulation syndrome (OHSS), 147, 164, 217
 - etiology, 182
 - and in vitro fertilization, 195–6
 - incidence, 15, 189
 - pathophysiology, 182–3
 - prevention, 148–50, 352
 - risks, 177
- ovarian length, 54, 56
- ovarian markers, 317
- ovarian steroidogenesis, abnormalities, 35–6
- ovarian stromal area, 55
- ovarian stromal blood flow, 170, 317–20
 - assessment, 318–19
 - imaging, 319
 - increased, 317–18
 - indices, 320, 321
 - studies, 319–20
- ovarian traumas, 169
- ovarian vascularization, Doppler ultrasonography studies, 59
- ovarian volume, 322
 - consensual threshold, 51
 - determination, 49, 58
 - factors affecting, 51
 - increase, 51, 179
 - ultrasound studies, 52

379 Index

- ovarian wedge resection, 92, 152, 168, 216, 326
 - effects on insulin resistance, 326
 - historical background, 159
 - and laparoscopic laser drilling, 163
 - and laparoscopy compared, 171
 - studies, 169
 - see also* laparoscopic ovarian drilling (LOD)
- ovaries
 - blood flow, 183
 - morphology, 245
 - ultrasound assessment, 316
 - multicystic, 178
 - polyfollicular, 269
 - stimulation, 145–50
 - abnormalities, 270–2
 - see also* multifollicular ovaries (MFOs); polycystic ovaries (PCO)
- overweight
 - long-term treatment guidelines, 131, 135
 - see also* obesity
- ovine corticotropin releasing hormone (oCRH), 299
 - stimulation tests, 294
- ovulation
 - and weight loss, 133–4
 - see also* anovulation
- ovulation induction, 14–17, 216
 - hyperinsulinism management, 141
 - metformin in, 15, 68–9, 142–4, 192–3
 - studies, 323–5
 - methods, 141, 186, 189
 - medical, 321–6
 - surgical, 326
 - in polycystic ovary syndrome, 140–54
 - superovulation strategies, 189–92
 - and weight loss, 141–2
- ovulation rates, 169
 - increase, 133
- Oxford Family Planning Study, 125
- oxidative status, measurement, 354
- oxidative stress, and insulin resistance, 354–5
- PAI-1 (plasminogen activator inhibitor-1), 207, 346
- Palmer forceps, 159–60
- pancreatic beta cell function, impaired, 84–6, 275
- papillomatosis, 116
- papules, 104
- parathyroid hormone, levels, 353
- partial lipodystrophy, 31–2
- PCO *see* polycystic ovaries (PCO)
- PCOS *see* polycystic ovary syndrome (PCOS)
- percoelioscopic treatments, in polycystic ovary syndrome management, comparisons, 165
- peripheral fat, 345
- peroxisome-proliferator activated receptors (PPARs), 73–4
- phenotypes, 25–38
 - confusion, 37
- α -phenylcinnamic acid, activity, 352–3
- phytanic acid, 351
- PI *see* pulsatility index (PI)
- pinitol (methyl-D-chiro-inositol), 347
- pioglitazone, 73–4, 144, 274, 301–2
 - trials, 74
- pituitary desensitization, 191
- plasminogen activator inhibitor-1 (PAI-1), 207, 346
- platelet aggregation, and insulin resistance, 354
- pneumoroentgenography, 6
- polycystic ovaries (PCO), 5, 25–6, 178
 - and anovulation, 31, 42
 - characteristics, 317
 - children, 45–6
 - definitions, 54–7
 - consensual, 49–53, 61–2
 - early criteria, 54
 - issues, 178–9
 - diagnosis, 178–9
 - differential diagnosis, 45–6, 178
 - etiology, 2
 - genetic, 25
 - external morphological features, 54
 - follicle stimulating hormone sensitivities, 147
 - and gestational diabetes mellitus, 85
 - and hyperandrogenism, 31, 179
 - imaging, 48–62
 - Doppler ultrasonography, 58–60, 179
 - issues, 48
 - magnetic resonance imaging, 60–1
 - three-dimensional ultrasonography, 58, 179, 319
 - transvaginal ultrasound, 318
 - two-dimensional ultrasonography, 48–58
 - and in vitro fertilization, 177–96
 - issues, 196
 - outcome studies, 183–4
 - in vitro oocyte maturation, 220
 - and insulin resistance, 185
 - laparoscopy studies, 7
 - and low birth weight, 343
 - macroscopic features, 42–3, 44
 - microscopic features, 43–5
 - and multifollicular ovaries compared, 53, 54
 - and polycystic ovary syndrome compared, 9–10
 - and premature pubarche, 245
 - prevalence, 9–10, 42, 181
 - girls, 245
 - primate models, 269–72
 - stimulation responses, for in vitro fertilization, 182–4
 - superovulation strategies, 189–92

380 Index

- polycystic ovaries (PCO) (cont.)
 - symptoms, 9–10, 42
 - ultrasound, 179
 - assessment, 50, 316, 317–18
 - diagnostic criteria, 7–9
 - images, 8
 - studies, 1, 7, 57–8
 - use of term, 179
- polycystic ovary syndrome (PCOS)
 - and acanthosis nigricans, 116
 - and acne, 104
 - adrenal androgen excess, 307
 - adrenocortical steroidogenesis, 293–8
 - epidemiology, 289–91
 - ethnic and racial differences, 291
 - prevalence, 289–91
 - adrenal steroidogenesis
 - extra-adrenal factors, 298–304
 - heritability, 304–7
 - adrenocortical dysfunction, 288–308
 - etiology, 298–9
 - measures, 291–3
 - studies, 301
 - age differences, 236
 - and androgenetic alopecia, 113
 - animal models, 263–4
 - and antioxidants, 354–6
 - in Asian women, 316–27
 - and blood pressure, 89, 243–4
 - and cardiovascular events, 92–3
 - children and adolescents, 233–52
 - clinical features, 180–1, 317–21
 - comorbidity, 66, 317
 - and congenital abnormalities, 185–6
 - cortisol metabolism, abnormalities, 295–8
 - definitional issues, 1–2, 53, 81, 178–9, 316
 - and depression, 134
 - dermatological features, 103
 - development, 244–5
 - and diabetes mellitus, 2, 12, 180
 - prevalence, 206–7
 - diagnosis, 6–9, 140, 180–1, 215
 - early studies, 6
 - issues, 9
 - diagnostic criteria, 25–6, 55, 65, 66, 178
 - development, 6–9
 - issues, 81, 237, 262–3, 288, 316
 - dietary interventions, 133
 - dietary recommendations, 2, 131–2, 345–7, 354–6
 - differential diagnosis, 11, 45–6
 - and dyslipidemia, 72, 88–9
 - early detection, 233
 - early studies, 4–6
 - and endometrial cancer, 93–4
 - ethnic and racial differences, 26–7, 316–17, 321, 327
 - etiology, 2, 12–13
 - environmental mechanisms, 263
 - hypotheses, 263
 - issues, 263
 - lifestyle factors, 121–30
 - familial aggregation, 27, 30
 - and fat distribution, and reproduction, 128
 - fertility issues, 186–8
 - fetal programming, 262–78
 - hypotheses, 275–8
 - follicle numbers, 57
 - genetic analyses, 32–4
 - genetic predisposition, 13
 - genetics, 245–6, 263, 344
 - genotypes, 25–38
 - sex differences, 26
 - and gestational diabetes mellitus, 317
 - and growth abnormalities, primate models, 267–78
 - heritability, 26, 233
 - heterogeneity, 215, 233
 - and hirsutism, 107
 - historical background, 4–17
 - hormonal characteristics, 317–21
 - and hyperandrogenism, 237–9, 288
 - and hyperinsulinemic insulin resistance, 204–9
 - and hypertension, 71
 - in utero development, 263–4
 - and in vitro fertilization, 177–96
 - issues, 196
 - and infertility, 317
 - laparoscopy, 159–72
 - and insulin resistance, 25–6, 71–2, 81, 204–9
 - cellular mechanisms, 207–9
 - epidemiology, 204–7
 - issues, 65–7, 182
 - markers, 12
 - nutritional issues, 344–5
 - prevalence, 13–14, 82–3, 141, 238, 241
 - roles, 204
 - screening issues, 209
 - lifestyle modification, 66–7, 75
 - guidelines, 131
 - and lipids, 72
 - literature, 5
 - long-term health factors, 81–95
 - long-term risks, 66
 - macroscopic features, 42–3, 44
 - management, 14–17
 - laparoscopy, 16
 - lifestyle factors, 121–30
 - strategies, 121
 - weight loss, 16–17, 335–6

381 Index

- markers, 343–4
 - surrogate, 2
- mechanisms, 57
- medical therapy, 67
- and Mendelian disorders, 31–2
- metabolic abnormalities, 275
 - primate models, 267–78
- metabolic characteristics, 320, 321, 343
- metabolic dysfunction, 262–3
- metabolic symptomatology, 12
- microscopic features, 43–5
- and minerals, 352
- morphological features, 159
- nutritional issues, 343–57
- and obesity, 2, 12, 13–14, 16–17, 331
 - etiology, 87
 - and glucose intolerance, 127
 - and infertility, 125–6
 - and infertility treatment response, 127–8
 - and menstrual disturbances, 123–5
 - and miscarriage, 126
 - and pregnancy, 126
 - prevalence, 86–7, 205
 - risk factors, 325, 180
- and obesity surgery, 331–9
 - outcome studies, 336
- onset, 237–8
- overview, 1–2, 4–17
- ovulation induction, 140–54
- pathogenesis, 65–6, 233, 248, 250
 - future research, 252
 - and nutrition, 343–4
- pathology, 42–6
- pathophysiology, 13–14
- pediatric origins, 233–52
 - mechanisms, 239–50
- peripubertal onset, hypotheses, 246–8
- phenotypes, 25–38
- and polycystic ovaries compared, 9–10
- prevalence, 4, 10, 65, 181, 237, 316
 - estimated, 288
 - ethnic and racial differences, 26–7, 316–17
 - studies, 9–10
- and puberty compared, 233–4
- pulsatility index, 59
- recognition, 4–6
- reproductive traits, 269–78
- resistive index, 59
- risk factors, 86
- skin manifestations, 102–17
- and smoking, 134–5
- spectrum concept, 10–11
- stress reduction, 135
- superovulation strategies, 189–92
- symptoms, 9–10, 11–12, 177–8, 262–3, 316, 343
 - early, 233
 - spectrum concept, 10–11
- treatment, 215–28, 251–2, 343
 - approaches, 215
 - insulin sensitizers, 65–75
 - novel, 215–NaN
 - surgical, 216
- twin studies, 30–1
- use of term, 179
- polyfollicular ovaries
 - incidence, 269
 - see also* multifollicular ovaries (MFOs)
- polyphenols, 352
- natural products, 352
- polyunsaturated fat, 346
 - sources, 346
- polyunsaturated fatty acids (PUFAs), 346
- post insulin receptor signaling, 351–3
- postprandial thermogenesis, 87
- power Doppler
 - and color Doppler compared, 58
 - ovarian stromal blood flow
 - assessment, 318–20
 - polycystic ovary images, 60
- PPAR- γ gene, mutations, 31–2
- PPAR- γ nuclear transcription factor, and thiazolidinediones, 73–4
- PPARs (peroxisome-proliferator activated receptors), 73–4
- preconception counseling, 184–6
 - approaches, 184–5
- pre-eclampsia, 184
 - avoidance strategies, 184–5
- pregnancy
 - and metformin, 69, 144
 - multiple, prevention, 148–50
 - and obesity, 125, 126
 - risk factors, 185
 - studies, 125
 - and obesity surgery, 337–8
 - outcome studies, 187–8
 - rates, 161–3, 168, 169
 - and smoking, 135
- premature balding, 13, 36–7
- premature pubarche, 235–6
 - and anovulation, 238
 - definition, 236
 - ethnic and racial differences, 243
 - and insulin resistance, 240–4
 - and polycystic ovaries, 245
 - symptoms, 236, 251
- PRF (pulse repetition frequency), 58

382 Index

- primate models
 - hyperandrogenism, 269–72, 278
 - for polycystic ovary syndrome, 267–78
 - see also* rhesus monkeys
- progesterone, 223
 - increase, 35–6
- progestogens, 105
- proliferator-activated receptor- γ (PPAR- γ), 351–3
 - activation, 351, 352
- protein metabolism, 351
- pseudofolliculitis, 109
- pubarche (premature) *see* premature pubarche
- puberty
 - definition, 233
 - insulin resistance, 235
 - insulin-like growth factor-1, 235
 - and multifollicular ovaries, 245
 - physiology, females, 233–5
 - and polycystic ovary syndrome
 - compared, 233–4
- PUFAs (polyunsaturated fatty acids), 346
- pulsatility index (PI), 59
 - in polycystic ovary syndrome, 59
- pulse repetition frequency (PRF), 58
- pulsed Doppler
 - applications, 58
 - polycystic ovary images, 60, 179
- pustules, 104
- pyloric stenosis, 32
- quercetin, 352
- 5 α -RA (5 α -reductase), 295–7
- 5 β -RA (5 β -reductase), 295–7
- racial differences *see* ethnic and racial differences
- radioimmunoassays, development, 6–7
- receiver operating characteristic (ROC)
 - curves, 51, 53
 - follicle number analysis, 51
- recombinant follicle stimulating hormone (rFSH), ovulation induction, 190–1
- recombinant human chorionic gonadotropin (rhCG), 269–70, 272–3
 - therapy, 273–4
- recombinant human follicle stimulating hormone (rhFSH), 15
 - stimulation, 272–3
 - therapy, 273–4
- recombinant human luteinizing hormone, 192
- recurrent miscarriage, 12
- 5 α -reductase (5 α -RA), 295–7
- 5 β -reductase (5 β -RA), 295–7
- reproduction
 - and body weight, 121–2
 - and fat distribution, 128
 - obesity effects on, 87, 124
- reproductive traits, polycystic ovary syndrome, 269–78
- resistin, 123, 350, 351
- resistive index (RI), in polycystic ovary syndrome, 59
- retinoic acid, 351
- retinoid X receptors (RXRs), 351
- retinoids, 105
- rexinoids, 351–3
- rFSH (recombinant follicle stimulating hormone), ovulation induction, 190–1
- rhCG *see* recombinant human chorionic gonadotropin (rhCG)
- rhesus monkeys
 - body weight, 268
 - estradiol levels, 271
 - fetal androgen excess studies, 265–6, 276–8
 - low birth weight, 265–6
 - males
 - fetal programming studies, 266–7
 - metabolic abnormalities, 275
 - polycystic ovary syndrome
 - impaired fertility, 272–4
 - metabolic abnormalities, 274, 276–8
 - outcomes, 269–75
 - reproductive traits, 269–72, 276–8
 - prenatally androgenized, 263–4, 269, 270
 - testosterone levels, 271
- rhFSH *see* recombinant human follicle stimulating hormone (rhFSH)
- RI (resistive index), 59
- ROC *see* receiver operating characteristic (ROC)
- rosiglitazone, 73–4, 144, 216–17, 274
 - trials, 74
- Rotterdam consensus *see* ESHRE/ASRM Rotterdam Consensus (2003)
- Roux-en-Y gastric bypass (RYGB), 331–2
 - outcome studies, 336
 - and pregnancy, 338
 - risk factors, 339
 - weight loss, 333–4
- RXRs (retinoid X receptors), 351
- RYGB *see* Roux-en-Y gastric bypass (RYGB)
- salicylic acid, 105
- sclerocystic ovaries, diagnosis, 6
- sebaceous glands, 102
 - physiology, 102
- seborrhea, 102
- semen analysis, 141
- serine kinase, regulation defects, 207–8

383 Index

- serine/threonine phosphorylation
 - hypothesis, 247
- sex hormone binding globulin (SHBG), 69,
 - 123, 141, 300
 - and hirsutism, 109–10
 - inhibition, 209
 - levels, 140–1, 336
 - elevated, 110, 209
 - and obesity, 325
 - reduced, 215, 234, 242–3, 335
- sex steroids, ovarian, 299
- shaving, hair removal, 109
- SHBG *see* sex hormone binding globulin (SHBG)
- SHBG gene, 32–3
- silymarin, 352
- skin manifestations
 - of polycystic ovary syndrome, 102–17
- sleep disorders, and obesity surgery, 335
- smoking
 - maternal, 134–5
 - and polycystic ovary syndrome, 134–5
 - and pregnancy, 135
- somatostatin, 75
- South Asians
 - insulin resistance, 26–7
 - polycystic ovary syndrome, 321
- soybeans, dietary issues, 347
- Spain
 - polycystic ovary syndrome
 - developmental studies, 263–4
 - and low birth weight, 265
 - prevalence, 26
- spermatozoa, preparation, 225
- spironolactone, 14, 251–2
 - in acne treatment, 105
 - in androgenetic alopecia treatment, 116
 - in hirsutism treatment, 110–12
- Stein, I. F., 4, 6, 42
- Stein–Leventhal syndrome *see* polycystic ovary syndrome (PCOS)
- steroid hormones
 - activity, candidate genes, 35–6
 - metabolites, 297
 - synthesis, genes in, 35–6
- steroidogenesis
 - and dehydroepiandrosterone sulfate, 292
 - intrafollicular, 272–3
 - ovarian, 35–6
 - see also* adrenal steroidogenesis;
adrenocortical steroidogenesis
- steroids
 - biosynthesis, 122–3
 - inhibition, 302–3
 - gonadal, 298–9
 - sex, 299
- stress reduction, 135
- stroma
 - imaging, 49
 - increased, 54–6, 179
- stromal echogenicity, 55–6
- stromal hyperthecosis, 46
- stromal hypertrophy, 54–6
 - assessment standardization, 55
- superovulation, strategies, 189–92
- surgery
 - ovulation induction, 326
 - in polycystic ovary syndrome treatment, 216
 - see also* laparoscopic ovarian drilling (LOD); laparoscopy; obesity surgery; ovarian electrocautery; ovarian wedge resection
- T *see* testosterone (T)
- TDTs (transmission disequilibrium tests), 33
- telogen, 105–6
- terminal hairs, 105, 106
 - growth grading, 107
- testosterone (T), 75, 83, 113
 - biosynthesis, 182, 208
 - concentration reduction, 326
 - excess, 275
 - exogenous, 299
 - follicular, 193
 - levels, 6–7, 12, 109–10, 168
 - circulating, 269–70
 - elevated, 215
 - reduction, 169, 209
 - rhesus monkeys, 271
 - pretreatment, 324–5
 - see also* dihydrotestosterone (DHT)
- testosterone enanthate, treatment, 299
- tetracyclines, 105
- 5 α -tetrahydrocortisol, 297–8
- TGA (Therapeutic Goods Administration) (Australia), 73–4
- TGF- β 1 (transforming growth factor- β 1), 106
- theca cells, 208
 - production, 208
 - proliferation, 354–5
- thecal hyperplasia, 182
- thelarche, 234
- Therapeutic Goods Administration (TGA) (Australia), 73–4
- thiazolidinediones (TZDs), 274, 301–2
 - activity, 302–3, 350
 - in diabetes mellitus type 2 treatment, 74
 - in polycystic ovary syndrome treatment, 73–4
 - side effects, 74
 - trials, 67
- thioglycates, 109

384 Index

- Third National Health and Nutrition Study (US), 353
- three-dimensional (3D) ultrasonography
 - disadvantages, 58
 - ovarian stromal blood flow, 318–19, 320, 321
 - studies, 319–20
 - polycystic ovary imaging, 58, 179
- thrifty genotype hypothesis, 264–5
- thrifty phenotype hypothesis *see* Barker hypothesis
- TNF- α *see* tumor necrosis factor- α (TNF- α)
- α -tocopherol (vitamin E), 354
- total body fat, assessment, 122
- transforming growth factor- β 1 (TGF β 1), 106
- transmission disequilibrium tests (TDTs), 33
- transsexuals, female-to-male, 299
- transvaginal hydrolaparoscopy, 164
- transvaginal ultrasound-guided
 - hydrocoagulation, 216
- transvaginal ultrasound-guided ovarian diathermy, 216
- triglycerides, 88–9
- trimethoprim, 105
- trimethylglycine *see* betaine
- troglitazone, 73–4, 123, 274, 292, 301–2
 - hepatotoxicity, 325
 - ovulation induction, 325
 - trials, 74
- tumor necrosis factor- α (TNF- α), 350
 - roles, 249
- tumors, 11–12
 - congenital adrenal virilizing, 278
- twin studies, 30–1
- two-dimensional (2D) ultrasonography
 - polycystic ovaries, 48–58
 - preparatory conditions, 48–9
 - recommendations, 48–9
 - routing
 - transabdominal, 48–9
 - transvaginal, 49
 - technical issues, 48–9
- type 2 diabetes mellitus *see* diabetes mellitus
- type 2 (DM2)
- TZDs *see* thiazolidinediones (TZDs)
- U/O (uterine width/ovarian length) ratio, 54
- uEGF (urinary epidermal growth factor), 169–70
- ultrasound
 - advantages, 7, 57, 61–2
 - diagnostic criteria, 7–9, 25–6
 - future trends, 61–2
 - high-resolution, 179
 - limitations, 245
 - polycystic ovary assessment, 50, 317–18
 - polycystic ovary images, 8, 179
 - polycystic ovary studies, 1, 7, 57–8
 - transabdominal, 7, 179
 - transvaginal, 7, 179, 318
 - see also* Doppler ultrasonography;
 - three-dimensional (3D) ultrasonography;
 - two-dimensional (2D) ultrasonography
- undernutrition, genetic effects, 264–5
- United Kingdom (UK)
 - metabolic syndrome studies, 343
 - obesity, 86–7
- United States (US)
 - dietary studies, 346–7
 - obesity, 86–7
 - prevalence, 121, 262
 - polycystic ovary syndrome, 321
 - definition, 316
 - prevalence, 26
 - see also* African Americans; Hispanics
- University of Adelaide (Australia), 121
- University of Wisconsin–Madison (US), 265–6
- uric acid, 353
- urinary epidermal growth factor (uEGF),
 - levels, 169–70
- uterine width/ovarian length (U/O) ratio, 54
- variable number tandem repeats (VNTRs), 36–7, 343–4
- vascular endothelial growth factor (VEGF), 179, 351, 355–6
 - concentrations, 319–20
 - distribution, 183
 - expression, 182–3, 195–6
 - levels, 169–70, 317–18
- vascular function, altered, 89–91
- vascularization flow index (VFI), 318–19, 322
- vascularization index (VI), 318–19, 322
- VEGF *see* vascular endothelial growth factor (VEGF)
- vellus hairs, 105, 106
- VFI (vascularization flow index), 318–19, 322
- VI (vascularization index), 318–19, 322
- virtual organ computer aided analysis (VOCAL), 318–19
- visceral fat, 345
 - loss of, 345
- vitamin A, 351
- vitamin B₃, 350–1
- vitamin B₁₂, 347–9
 - activity, 349
 - levels, 349
 - studies, 350
- vitamin D, levels, 353
- vitamin E, 354
- vitamins, 347–51, 350
 - deficiencies, 347–9
 - supplementation, 356

385 **Index**

- VNTR gene, 37
- VNTRs (variable number tandem repeats), 36–7, 343–4
- VOCAL (virtual organ computer aided analysis), 318–19
- waist/hip ratio (WHR), 122
 - and conception rate, 128
 - and menstrual disturbances, 128
 - metformin effects, 70–1
 - ranges, 122
- walnuts, 346
- weight gain
 - and energy expenditure, 345
 - postnatal, 267
- weight loss
 - and androgenetic alopecia, 115
 - dietary differences, 131
 - diet-induced, 335
 - effects
 - on infertility, 128–9
 - on menstruation, 128–9
 - and energy expenditure, 345
 - and hirsutism, 109–10
 - and insulin resistance, 82, 133–4, 335–6
 - and lifestyle modification, 129–33
 - and metformin, 70–1
 - and obesity, 87
 - metabolic factors, 334–5
 - and obesity surgery, 332, 333–4
 - reviews, 333–4
 - and ovulation, 133–4
 - and ovulation induction, 141–2
 - in polycystic ovary syndrome management, 16–7, 66–7, 335–6
 - and pre-eclampsia, 184–5
 - surgically induced, 129
 - see also* low birth weight
- whiteheads (closed comedones), 104
- WHO (World Health Organization), 206–7
- WHR *see* waist/hip ratio (WHR)
- Wisconsin National Primate Research Center (WPRC) (US), fetal programming studies, 265–6
- women *see* females
- World Health Organization (WHO), diagnostic criteria, 206–7
- WPRC (Wisconsin National Primate Research Center) (US), 265–6
- Yasmin, 105