

Index

- ACE inhibitors, 111, 204, 209–16, 221, 233
 comparative trials, 217–18
 lipid lowering effect, 228
 possible deleterious effects, 218–19
see also individual drugs
- acquired immunodeficiency syndrome (AIDS), 184
- acromegaly, 185
- acute phase response, 180–1, 182
- adenocarcinoma, 183
- age influences, 45, 46–7, 64
- Albustat, 17
- albumin, 7
- albumin:creatinine ratio, 22–7, 41–7
- excretion rate (AER)
 day-to-day variation, 21
 diurnal variation, 19–21
 influencing factors, 8–9
 microalbuminuria progression and, 84
 pregnancy and, in diabetes, 84–6
 structure and function of, 7
 transcapillary escape, 109
 urinary excretion mechanisms, 5–6
see also microalbuminuria; urinary protein excretion
- albuminuria *see* microalbuminuria; urinary protein excretion
- Albuscreen, 15
- Albusure kit, 15–16
- alcohol intake, 45, 49, 133
- aldose reductase inhibitors, 225–6
- alpha-blocking agents, 221, 233
- alpha-1-microglobulin, 7, 73
- alprenolol, 230
- aminoguanidine, 226
- amylase, 71
- anaesthesia, 181
- angina, 154–5, 158
- angiotensin converting enzyme (ACE), 100, 107, 112
see also ACE inhibitors
- angiotensin II, 5, 100
 receptor antagonist, 216
- antihypertensive agents, 204–21
 comparative trials, 216–18
 deleterious effects of, 218–19
 effects of blood pressure reduction
 acute and short-term effects, 204–6
 longer-term effects, 206–9
 specific intra-renal effect, 209–11
 mechanisms for, 211–16
 target blood pressure, 219–21
see also blood pressure; hypertension; individual drugs
- antioxidants, 147
- antiprostaglandins, 225
- antithrombin III, 143, 144, 145
- apolipoproteins, 130, 137–9, 141–2
- arachidonic acid, 101, 102
- aspirin, 111, 230
- atenolol, 216, 218, 219
- atherosclerosis, 116, 163
 endothelium role in, 106–7
 free radical activity and, 147
 in diabetic subjects, 157–60
 insulin-dependent diabetes, 160
 non-insulin-dependent diabetes, 149, 157–60
 in non-diabetic subjects, 154–6
see also cardiovascular disease
- autoregulation, 3
- basement membrane, 3, 105
- Bence-Jones proteinuria, 177, 183
- bendrofluazide, 209
- beta blockers, 133, 204, 218, 232
see also individual drugs
- beta-2-microglobulin, 7
- blood glucose *see* glycaemia; hyperglycaemia
- blood glucose control, 193–204
 acute effects in long-term diabetes, 193–5
 primary prevention, 195–200
 secondary prevention, 200–4
- blood pressure, 40
 definition of, 117
 microalbuminuria relationships, 45, 46, 47–8, 64

246 *Index*

- blood pressure (*contd.*)
 non-insulin-dependent diabetes, 79–80
 progression of microalbuminuria, 82–3
 nocturnal patterns, 126
 target blood pressure, 219–21
see also antihypertensive agents; hypertension
- body weight, 45, 47, 48
see also obesity
- Bowman's capsule, 1
- bradykinin, 216
- bromophenol blue, 17
- C-peptide, 79
- calcium channel blockers, 216, 218, 221, 232–3
see also individual drugs
- cancer, 177, 182–3
- captopril, 205–7, 209–11, 213, 218, 233
 comparative trials, 216–17
- cardiomyopathy, 153
- cardiovascular autonomic neuropathy, 153
- cardiovascular disease (CVD), 40–1
 macrovascular disease, 67
 microalbuminuria predictive value, 29, 32, 53
 non-insulin-dependent diabetes, 56, 79
 microalbuminuria relationships, 116–63
 diabetes and, 116–17, 157–60
 non-atherosclerotic cardiovascular disease, 152–4
 non-diabetic subjects, 154–6
 proteinuria and, 160–1
 von Willebrand factor and, 111
see also individual diseases
- catecholamines, 181
- cholesterol, 45
 hypercholesterolaemia, 49, 130–1, 134
 ketocholesterol, 147–8
 lipid lowering agents, 227–8
 microalbuminuria and, 130–3
 in insulin-dependent diabetes, 133–9
 in non-insulin-dependent diabetes, 140–2
see also high density lipoprotein cholesterol; lipids; low density lipoprotein cholesterol; very low density lipoprotein cholesterol
- cholesteryl ester transfer protein (CETP) activity, 138
- chondroitin sulphate (CS), 105, 110
- chronic obstructive pulmonary disease (COPD), 187
- cigarette smoking *see* smoking
- clonidine, 204–5
- coagulation, 100–4
- cod-liver oil, 224–5
- collagen, 100
- complement system, 152, 181, 183
- congestive cardiac failure, 153
- connective tissue disease, 186–7
- continuous subcutaneous insulin infusion (CSII), 193–5, 197, 200–1
- coronary heart disease (CHD), 40, 111
 immunological basis, 152
 in diabetic subjects, 157–60
 in non-diabetic subjects, 154–6
- lipoprotein Lp(a) and, 140, 143
 proteinuria and, 161
see also cardiovascular disease
- corticosteroids, 133
- creatinine
 albumin:creatinine ratio, 22–7, 41–7
 excretion rate, 26
 serum levels, 192–3
- D-penicillamine, 184
- Diabetes Control and Complications Trial (DCCT), 77, 195–200
- diabetes mellitus
 albumin excretion rate in pregnancy, 84–6
 microalbuminuria management *see* microalbuminuria
 microalbuminuria relationships, 53–86
 cardiovascular disease and, 116–17
 determinants of, 64–70
 fibrinolysis, 144–7
 free radical activity and, 147–9
 haemostasis, 144–7
 platelet function, 144–7
 predictive value, 29, 53, 54–6
 screening, 31
see also insulin-dependent diabetes mellitus; non-insulin-dependent diabetes mellitus
- diabetic nephropathy, 19, 148, 154
 development of, 76–7, 123–4, 140, 202, 228
 genetic factors, 64–5
 in pregnancy, 179
 microalbuminuria predictive value, 29, 41
 prognosis, 160–1
 renal histological changes, 68–70
- diabetic retinopathy, 66, 148, 153, 202
 effects of improved metabolic control, 195–200
- diacylglycerol, 100
- diet
 fat intake, 45, 50
 fibre, 45, 50
 manipulations, 221–5
 fatty acids, 224–5
 low protein diet, 221–4
 protein intake, 50
- diltiazem, 204
- dip-stick tests, 16
- doxazocin, 218, 219, 233
- drug-induced microalbuminuria, 184–5
- dyslipidaemia *see* cholesterol; lipids
- dyslipoproteinaemia, 130–3
 in insulin-dependent diabetes, 133–40
 in non-insulin-dependent diabetes, 140–3
see also lipoproteins
- early morning urine sample (EMU), 22, 25, 26
- enalapril, 206–8, 211–13, 214–16, 233
 comparative trials, 216–18
- endocrine disease, 185
- endothelial derived hyperpolarising factor (EDHF), 99
- endothelial derived relaxing factor (EDRF), 98–100, 105–8, 216

Index

247

- formation of, 100
- endothelial permeability, 105
- endothelins, 99, 108
 - ET-1, 99–100, 106–7, 108–9
- endothelium
 - dysfunction of, 106–12
 - endothelial cells, 1
 - function of, 97–104, 143
 - coagulation and fibrinolytic factors, 100–4
 - growth factors, 104
 - vasomotor tone, 98–100
 - sub-endothelial structures, 105–6
- enzyme-linked immunosorbent assay (ELISA), 13, 14
- epithelial cells, 3
- erythrocyte sodium lithium countertransport (SLC) activity, 119, 123–4, 131
- ethnic influences
 - hypertension impact on albumin excretion, 118, 122–3, 128–9
 - microalbuminuria, 45–6, 61
- exercise, 9, 19–21, 50
- extra-cellular matrix, 105

- factor IV, 146
- factor V, 103
- factor VII, 145
- factor VIII, 103, 111, 145
- fatty acids, 224–5
- febrile illnesses, 181–2
- felopidine, 232
- fever, 181–2
- fibrinogen, 50, 103, 121, 144–5
 - transcapillary escape, 109
- fibrinolysis, 100–4, 139, 143–4
 - in diabetes, 144–7
- fibroblast growth factor (FGF), 104
- fibronectin, 3, 104
- filtration barrier, 1–3, 5
- first morning urine sample (EMU), 22, 25, 26
- fosinopril, 213–14
- free radicals, 106
 - in diabetes mellitus, 147–9
- Friedwald formula, 132

- gender influences, 45, 46, 47
- genetic factors, 64–5, 119
- genito-urinary infection, 177
- glomerular filtration rate (GFR), 192
 - single nephron glomerular filtration rate (SNGFR), 215–16
- glomerular proteinuria, 70–3, 182
 - drug-induced, 185
- glomerulonephritis, 129, 178, 184
- glomerulus, 1
- glycaemia, 46, 47, 49, 66
 - hyperglycaemia, 81, 108, 133, 143
 - microalbuminuria progression and, 81–2
 - see also* blood glucose control; diabetes mellitus
- glycosaminoglycans (GAGs), 3, 50, 105, 110, 215
 - therapeutic use, 227
- Goodpasture syndrome, 184

- graft rejection, 178
- growth factors, 104
 - antagonists, 228–9
 - see also individual growth factors*
- growth hormones, 228
 - therapy, 185

- haemoglobinuria, 177
- haemostasis, 143–4
 - in diabetes mellitus, 144–7
- heparin sulphate (HS), 105
- heparin therapy, 111, 227
- high blood pressure *see* hypertension
- high density lipoprotein (HDL) cholesterol, 45, 49, 84, 130–3
 - dietary manipulations, 225
 - in insulin-dependent diabetes, 133–9
 - in non-insulin-dependent diabetes, 140–2
 - lipid lowering treatment, 228
- histamine, 98, 104
- human immunodeficiency virus (HIV), 184
 - HIV associated nephropathy (HIVAN), 184
- human leucocyte antigen (HLA), 7
- hydralazine, 213, 214
- hydrocarbon exposure, 120
- hydrochlorothiazide, 209, 213, 214, 217
- hypercholesterolaemia, 49, 130–1
 - in insulin-dependent diabetes, 134
 - see also* cholesterol; lipids
- hyperglycaemia, 81, 108, 133, 143
 - see also* blood glucose control; diabetes mellitus
- hyperinsulinaemia, 48, 49, 119, 121
 - in non-insulin-dependent diabetes, 140
 - see also* insulin resistance
- hyperlipidaemia, 49
 - microalbuminuria relationships, 130–3
 - see also* cholesterol; lipids
- hypertension, 32, 47, 154–6
 - definition of, 117–18
 - endothelial dysfunction and, 107, 109–11
 - management of, 230–3
 - microalbuminuria relationship, 117–21
 - in insulin-dependent diabetes, 121–6
 - in non-insulin-dependent diabetes, 126–9, 158–9
 - proteinuria and, 160
 - see also* antihypertensive agents; blood pressure

- immune complexes, 152, 183
- immunoglobulin A (IgA), 6
- immunoglobulin G (IgG), 7
 - glomerular proteinuria, 70–3
- immunoturbidimetry (IT), 12, 14
- indomethacin, 225
- inositol trisphosphate, 100
- insulin resistance, 47, 49, 131, 133–4, 144
 - hypertension and, 119, 126, 128
 - in non-insulin-dependent diabetes, 140
 - microalbuminuria and, 150–2
 - see also* diabetes mellitus
- insulin therapy, 193–204

248 *Index*

- insulin-dependent diabetes mellitus (IDDM)
 albumin excretion rate in pregnancy, 84–6
 glucose disposal rates, 150
 microalbuminuria relationships, 53–86, 191
 blood glucose control effects, 193–5
 blood pressure reduction effects, 204–7, 209
 cardiovascular disease and, 153–4, 160
 determinants of microalbuminuria, 64–7
 development and progression of
 microalbuminuria, 74–8
 dyslipoproteinaemia and, 133–40
 endothelial dysfunction, 108–10
 free radical activity and, 148–9
 hypertension and, 121–6
 management, 231
 predictive value, 29, 53, 54, 55
 prevalence, 60, 61–4, 64
 renal histological changes, 67–9
 screening, 31–2
 proteinuria and, 160–1
 glomerular proteinuria, 71–3
 tubular proteinuria, 73–4
see also diabetes mellitus
 insulin-like growth factor 1 (IGF1), 104, 228
 intercellular adhesion molecule-1 (ICAM-1), 106, 109
 interleukins, 181
 IL-1, 6, 106
 intermediate density lipoprotein (IDL), 132
 in insulin-dependent diabetes, 135, 137, 139
 in non-insulin-dependent diabetes, 141
 intermittent microalbuminuria, 77
 isradipine, 232
- ketocholesterol, 147–8
 kidney, 1–3
 graft rejection, 178
 renal blood flow, 5, 6
 renal histological changes, 67–70
see also renal diseases
 kinins, 181, 183
- laminin, 3, 100, 105
 laser immunonephelometry (IN), 12
 leprosy, 179
 linoleic acid, 224
 lipids, 40
 dietary fat intake, 45, 50
 manipulation, 224–5
 effects of antihypertensive agents, 218–19
 hyperlipidaemia, 49
 microalbuminuria relationship, 130–3
 lipid lowering agents, 111, 227–8
 microalbuminuria progression and, 83–4
see also cholesterol
 lipoproteins, 130–3
 apolipoproteins, 130, 137–9, 141–2
 in insulin-dependent diabetes, 133–40
 in non-insulin-dependent diabetes, 140–3
 lipoprotein Lp(a), 136, 137–40, 141–3
see also dyslipoproteinaemia
 liquid phase fluorescent immunoassay, 13
- lisinopril, 233
 lithium therapy, 179
 lovastatin, 228
 low density lipoprotein (LDL) cholesterol, 110, 130, 132–3
 dietary manipulations, 225
 in insulin-dependent diabetes, 133, 135–9
 in non-insulin-dependent diabetes, 141
 lipid lowering treatment, 228
 oxidation of, 147
 lupus erythematosus, 184, 186–7
 lymphoma, 183
 lymphoproliferative disorders, 182–3
 lysosomes, 3
- malignancies, 177, 182–3
 Mediterranean fever, 182
 melanoma, 183
 mesangial cells, 3
 mesenchymal derived cells, 105
 metoprolol, 205, 209, 214, 232
 comparative trials, 216–17
 Micral-Test I, 16, 17
 Micral-Test II, 16
 microalbuminuria, 11, 54
 definition of, 40–1
 determinants of, 41–50, 64–70
 age, 45, 46–7, 64
 blood pressure, 45, 46, 47–8, 64
 demographic factors, 46–7
 duration of diabetes, 64
 ethnic variation, 45–6
 genetic factors, 64–5
 glycaemia, 66
 life-style factors, 49–50
 development and progression of, 74–84, 192
 blood pressure and, 82–3
 glycaemic control and, 81–2
 in insulin-dependent diabetes, 74–8
 in non-insulin-dependent diabetes, 78–80
 initial albumin excretion rate and, 84
 lipids and, 83–4
 secondary prevention study, 200–4
 smoking and, 84
 drug-induced, 184–5
 dyslipoproteinaemia and, 130–3
 in insulin-dependent diabetes, 133–40
 in non-insulin-dependent diabetes, 140–3
 endothelial dysfunction and, 106–12
 glomerular proteinuria, 70–3
 hyperlipidaemia and, 130–3
 hypertension relationship, 117–21
 in insulin-dependent diabetes, 121–6
 in non-insulin-dependent diabetes, 126–9
 intermittent microalbuminuria, 77
 management of in diabetes mellitus, 191–230, 231
 aldose reductase inhibitors, 225–6
 antihypertensive agents, 204–21
 antiprostaglandins, 225
 blood glucose management, 193–204
 dietary manipulations, 221–5

Index

249

- growth factor antagonists, 228–9
 heparin and glycosaminoglycans, 227
 inhibition of advanced glycation end product formation, 226
 lipid lowering agents, 227–8
 monitoring effects of intervention, 192–3
 measurement of, 11–29
 laboratory measurements, 11–15
 reference ranges, 27–9
 sample handling, 18
 side-room tests, 15–17
 timed and untimed urine collections, 22–7
 predictive value of, 29, 41, 53
 insulin-dependent diabetes, 54, 55
 non-insulin-dependent diabetes, 54–6
 prevalence, 42–4, 57–64
 insulin-dependent diabetes, 60, 61–4
 non-insulin-dependent diabetes, 58, 59–61
 renal histological changes, 67–70
 screening for, 30–2
 cost-effectiveness of, 32
see also albumin; cardiovascular disease; diabetes mellitus; urinary protein excretion
 Microalbuminuria Collaborative Study Group, 61
 Microbumintest, 16–17
 mortality, microalbuminuria predictive value, 40–1, 53, 155–6
 non-insulin-dependent diabetes, 56, 159–60
 myeloma, 183
 myeloproliferative disorders, 183
 myoglobinuria, 177

 N-acetyl- β -D-glucosaminidase (NAG), 6, 73, 74, 178, 187
 N-deacetylase, 105
 N-monomethyl-L-arginine (NMMA), 107–8
 neoplasms, 177, 182–3
 nephrolithiasis, 177
 nephron, 1–2
 nephrotic syndrome, 130, 178
 nicardipine, 206, 217, 232–3
 nifedipine, 206–8, 213–14, 218, 232
 comparative trials, 217
 nitrendipine, 218, 232–3
 nitric oxide *see* endothelial derived relaxing factor
 non-insulin-dependent diabetes mellitus (NIDDM)
 albumin excretion rate, 19, 21
 glucose disposal rates, 150–2
 microalbuminuria relationships, 53–86, 191
 blood pressure reduction effects, 205–6, 207, 209
 cardiovascular disease and, 157–60
 determinants of microalbuminuria, 64–7
 development and progression of microalbuminuria, 78–80
 dyslipoproteinaemia and, 140–3
 endothelial dysfunction, 109–10
 free radical activity and, 148–9
 hypertension and, 126–9
 management, 231
 predictive value, 29, 41, 54–6
 prevalence, 58, 59–61, 64
 renal histological changes, 69–70
 screening, 31–2
 NAG activity, 74
 proteinuria and, 161
 see also diabetes mellitus
 obesity, 48, 107, 118, 130–1
 see also body weight
 octreotide, 112, 228
 olive oil, 224–5
 oral contraceptives, 97

 pancreatitis, 181, 182
 pericytes, 3
 perindopril, 214, 217
 peripheral vascular disease (PVD)
 in non-diabetic subjects, 156
 in non-insulin-dependent diabetes, 157–9
 see also cardiovascular disease
 phospholipase C, 100
 pinocytosis, 5
 plasminogen activator inhibitor (PAI-1), 104, 106, 107, 112, 143
 in diabetes mellitus, 144, 146
 platelet derived growth factor, 98, 101–3, 104
 platelet function, 143–4
 in diabetes mellitus, 144–7
Pneumocystis carinii, 184
 podocytes, 3
 pre-eclampsia, 179–80
 pregnancy
 albumin excretion rate in diabetes, 84–6
 renal disease, 179–80
 urinary protein excretion and, 9
 premature birth, 180
 prostacyclin (PGI₂), 99, 101–3, 106
 prostaglandins, 5, 181, 232
 antiprostaglandins, 225
 protein C, 103, 143, 146
 protein excretion *see* microalbuminuria; urinary protein excretion
 protein intake, 50
 low protein diet, 221–4
 protein kinase C, 100
 protein S, 143, 146
 proteinuria *see* microalbuminuria; urinary protein excretion
 proteoglycans, 105
 psoriasis, 187
 pyelonephritis, 129
 pyrogallol red–molybdate, 14

 radial immunodiffusion (RID), 12, 14
 radioimmunoassay (RIA), 11–12, 14, 53
 ramipril, 233
 renal blood flow, 5, 6
 renal diseases, 177–9
 in pregnancy, 179–80
 see also kidney
 renal scarring, 178
 reserpine, 213, 214
 respiratory disease, 187

250 *Index*

- 'response to injury' hypothesis, 106
 retinol-binding protein (RBP), 7, 9, 74, 178
 retinopathy *see* diabetic retinopathy
 rheumatoid arthritis, 187
- sample handling, 18
 screening, 30–2
 cost-effectiveness, 32
 seizures, 181, 182
 selectins, 106
 single nephron glomerular filtration rate (SNGFR), 215–16
 single nephron plasma flow (SNPF), 215–16
 skin disease, 186–7
 slide agglutination tests, 15–16
 smoking, 108, 121, 230
 disease progression and, 84
 microalbuminuria and, 45, 49–50, 124, 149–50
 sodium lithium countertransport (SLC) activity, 119, 123–4, 131
 solid phase fluorescent immunoassay, 13
 somatostatin, 228
 somatulin, 229
 sorbinil, 226
 sulodexide, 111, 227
 superoxide, 106
 superoxide dismutase, 147
 surgical procedures, 180–1
 systemic lupus erythematosus (SLE), 186–7
 systemic sclerosis, 186
- Tamm Horsfall mucoprotein, 6, 8
 thiazide diuretics, 133, 209, 232
 deleterious effects of, 218
 see also individual drugs
 thrombin, 98
 thrombomodulin, 103, 109
 thrombosis, 143
 thromboxane B₂, 103
 tissue plasminogen activator (tPA), 104
 tobacco smoking *see* smoking
 tolrestat, 226
 transcapillary escape rate (TER), 109, 205
 transferrin, 7–8, 9
- glomerular proteinuria, 71–3
 tubular proteinuria, 73
 transforming growth factor β (TGF β), 104
 trauma, 180–1
 triglycerides, 45–6, 49, 84, 131–2, 145
 dietary manipulations, 225
 in insulin-dependent diabetes, 133–8
 in non-insulin-dependent diabetes, 79, 140, 141
 tubular proteinuria, 73–4, 182
 drug-induced, 185
 tumour necrosis factors, 6, 106, 183, 184
- upright posture, 9
 urinary infection, 177, 178
 urinary protein excretion
 cardiovascular disease and, 160–1
 glomerular proteinuria, 70–3, 182, 185
 mechanisms of, 3–7
 physiological determinants of, 8–9
 tubular proteinuria, 73–4, 182, 185
 see also microalbuminuria
 urine samples
 early morning urine sample (EMU), 22, 25, 26
 sample handling, 18
 timed and untimed urine collections, 22–7
 urokinase, 6
 uromodulin, 6
- vascular cell adhesion molecule-1 (VCAM-1), 106, 109
 vascular responsiveness, 66–7, 107–8, 149
 vasomotor tone, 98–100
 verapamil, 216
 very low density lipoprotein (VLDL) cholesterol, 84, 132–3
 dietary manipulations, 225
 in insulin-dependent diabetes, 137, 139
 in non-insulin-dependent diabetes, 141
 vesico-ureteric reflux, 178
 von Willebrand factor, 103–4, 107, 110–12
 hypertension and, 121
- water loading, 8
 weight *see* body weight; obesity