

Index

Note: page numbers in *italics* refer to figures, those in **bold** refer to tables

- abdominal pain
 - with associated ankle swelling 98–105
 - causes 98–9
 - clinical examination 99
 - investigations 100
 - and peritoneal dialysis 187–92
 - and vomiting with type 1 diabetes 148–53
- abdominal system examination 11
- ABO antigens, renal transplantation
 - compatibility 195, 196, 197
- acid–base disturbance 149–50
- alcoholism 228
- osteosarcoma recurrence 155
- acidosis 28, 149, 150, 153
 - as an indication for dialysis 40
- acute renal failure (ARF)/acute kidney injury
 - abnormal glomerular filtration rate 14–15
 - causes 14–15, 163
 - clinical features 215
 - diagnosis **15**, 33
 - dialysis 40, 215
 - fluid balance **29**, 215
 - fluid regimen 215
 - hyperkalaemia 39
 - investigations 215
 - line insertion 169–70
 - management 33–4, 36, 215
 - secondary to
 - benign prostatic hyperplasia 37–44
 - outflow obstruction 40–1
 - tubulointerstitial necrosis 69–71
 - rash with renal impairment, associated with 68
 - with red cell casts 215
 - renal biopsy in 33, 49, 53, 58, 66, 69, 75
- acute tubular necrosis (ATN) 2, 33, 34
 - causing acute renal failure 35
 - and delayed graft function 202–3
 - diagnosis 34–5
 - and multiple myeloma 47
 - post-renal transplant 202–3, 209
 - renal biopsy changes 33
 - and tubular dysfunction 34
- acute-on-chronic renal failure, diagnosis 33
- ADAMTS13 metalloproteinase 91, 92
- adult polycystic kidney disease (APKD) 10, 219
 - clinical presentation 142
 - cyst formation 138, 139, 141, 142
 - family history 32
 - follow-up 140
 - history taking 138
 - investigations 139–40
 - macroscopic haematuria 63, 138–42
 - management 140
 - renal replacement therapy 141, 228
 - screening 140
- advanced glycosylation end products (AGE) 152
- airway 30
- AL amyloid 103–4
 - prognosis 104, 105
- albumin, reduced serum level 93, 100, 107, 113
 - associated with obesity 107
 - associated with oedema with proteinuria 93, 100, 107, 113, 227
- albumin/creatinine ratio (ACR) 22
- alcohol consumption, hypertension reduction 120
- alcoholism 228
- aldosterone 2, 4–6
- alkaline phosphatase, hypercalcaemia
 - investigations 47
- alkalosis 149, 150, 153
- Alport's syndrome 10
 - Goodpasture's disease post-transplant 77
- aluminium overload 176
- amino acids 2, 3
- amyloid 102, 105
 - proteins 102–3, 104
- amyloidosis
 - classification **103**
 - renal 102–3
 - systemic 105
- anaemia 8
 - causes **87**
 - in chronic kidney disease 163, 166
 - dialysis, associated with 175, 176
 - erythropoietin administration 173
 - secondary to haemoptysis with oliguria 74
 - macrocytic 86, **87**
 - microangiopathic haemolytic 87–8
 - shortness of breath, associated with 169
- anaesthetic risk, renal transplantation 194
- ANCA-associated vasculitis 58–61, 216
 - actiopathogenesis 61
 - prognosis 60–1
 - treatment 59–60
- angiography 23–4
- angiotensin II 5, 6
 - and thirst 45
- angiotensin receptor blockers (ARBs) 26, 121, **122**
 - in management of
 - adult polycystic kidney disease 140
 - IgA nephropathy 66
- angiotensin-converting enzyme (ACE) 5, 6
 - angiotensin-converting enzyme (ACE) inhibitors 26
 - in management of
 - adult polycystic kidney disease 140, 142
 - hypertension reduction 121, **122**
 - IgA nephropathy 66, 67
 - lupus nephritis 82, 84
 - post-infectious glomerulonephritis 53, 55
 - tubulointerstitial nephritis 70, 71
 - renal function decline in renal artery stenosis 125
- anion gap 150, 153
 - high in metabolic acidosis 149–150, 217
 - high in salicylate overdose 217
 - normal in renal tubular acidosis 155
- Ankle Brachial Pressure Index (ABPI) 123–4
- ankle swelling 93–7
 - with abdominal discomfort 98–105
 - secondary to obesity 106–12
- anti-doublestranded DNA antibodies (dsDNA) 19, **80**
- anticoagulation
 - in membranous glomerulonephritis 96
 - in minimal change glomerulonephritis 115
- anti-diuretic hormone (ADH) 2, 5, 159–60, 161
 - polydipsia and insensitivity to ADH 45
 - syndrome of inappropriate ADH (SIADH) 159–161
- anti-DNAse antibodies 21, 52
- antigen presenting cells (APCs) 83, 196, 207
- anti-glomerular basement membrane (GBM) antibody 75–6
- anti-glomerular basement membrane (GBM) disease 72–77, 216

- anti-hypertensive agents 121, **122**
 contraindications 124
- anti-neutrophil cytoplasmic antibodies (ANCA) 19, 58–59
 molecular mimicry 61
- anti-nuclear antibodies 19, **80**
- anti-streptolysin antibodies 21, 52
- anuria 8
- approach to patient 8–12
- aquaporins 4, 5, 161
- Aristolochia clematitis* (aristolochic acid) 71
- arterial disease 124–5
- ascites 99
 nephrotic syndrome in children 113
- aspirin
 in lupus nephritis 82
 salicylate overdose 217
- atherosclerosis
 chronic kidney disease 164
 renal artery stenosis 124, 127
- autoimmune disease markers 19–20
- autosomal dominant polycystic kidney disease (ADPKD) 138, 141, **142**
- azathioprine 197, 198–9, 200
 in IgA nephropathy 66
 in SLE treatment 82
 in preventing transplant rejection 197–198, **199**
- back pain and polydipsia 45–50
- Balkan nephropathy 70–1
- Beau's lines 100
- beetroot, dark urine 144
- Bence-Jones protein 21, 47
- benign prostatic hyperplasia
 acute renal failure 37–44
 macroscopic haematuria 63
- beta-blockers 121, **122**
 contraindications 124
- bicarbonate ions 2
- bicarbonate supplementation, renal tubular acidosis 156, 158
- bilirubin 86
- biochemical investigations 224
- bisphosphonates, hypercalcaemia management 49
- BK nephropathy 204–5
- bladder 1, 2
 flushing 109
 tumours, macroscopic haematuria 63
- blood, urine dipstick 133–7
- blood pH 149, 155
- blood pressure
 classification 117, **118**
 control 5, 121, **122**
 hypotension with dialysis 173–4
 monitoring 122
see also hypertension
- blood tests 18–21
- body mass index (BMI), obesity 106
- bone disease, renal 163
- bortezomib 49–50
- Bowman's capsule 1–2
- breathing 30
- Buerger's test 123
- C3 nephritic factor 20, 135, 137
- C3, C4 in post-infectious glomerulonephritis 53, 54
- C3NeF_a 135
- C3NeF_s 137
- C4, lupus nephritis 81
 Alpha-calcidol 174
- calcification
 extraskeletal 164
 soft tissue 179–80
- calcineurin inhibitors 197–198, 202
 toxicity **199**, 203, 205
- calcitriol, renal bone disease 163
- calcium metabolism abnormalities
 chronic kidney disease 163–4
 hypocalcaemia in chronic kidney disease 167
see also hypercalcaemia; hypercalciuria
- calcium oxalate stones 130–2
- calcium urolithiasis **131**
- capillary loop 1, 2, 3
- carbon dioxide
 acid–base disturbance 149, 150
 retention 127
- cardiac arrest, risk with hyperkalaemia 37
- cardiac arrhythmias, hyperkalaemia 37
- cardiac output 5, 30
- cardiomegaly, hypertension-induced 119, **119**
- cardiovascular system examination 11
- cast formation 48, 49, 145
- catheter insertion, peritoneal dialysis 181–2
- CD4 T cells 83, 207
- CD8 T cells 207
- central pontine myelinolysis 162
- cerebral haemorrhage, dialysis patient 178
- chemoreceptors
 central 150
 peripheral 149–50
- chest X-ray
 with blunted costophrenic angle 95
 with cardiomegaly **119**
 with dialysis line **170**
- children
 infant polycystic kidney disease **142**
 nephrotic syndrome 113–16
- chlorambucil, membranous glomerulonephritis 96
- chloride ions 2, 150, 155
- chronic kidney disease (CKD) 5, 163–8, 193–200
 abnormal glomerular filtration rate 14, 15
 causes 163, **164**, 168
 classification **16**
 clinical examination 165
 complications 163–4, 168, 219
 diagnosis 166
 history taking 164
 hyperkalaemia 39, 40
 hypertension 13
 investigations 165–6
 secondary to renal artery stenosis 125
 review frequency 167
 screening 168
 stages **166**
 treatment 28, 166–7, 168
- treated with renal transplantation 193–5, 196, 197–200
- chronic kidney disease–bone and mineral disorder (CKD–BMD) 163–4
- chronic obstructive pulmonary disease (COPD) 106
- Churg–Strauss syndrome **60**, 240–1
- ciclosporin 197, 198–9, 200
 in membranous GN 96
 in minimal change GN 114
 in renal transplantation **199**, 211
- cigarette smoking, hypertension with renal impairment 123–7
- circulation 30
- claudication 123
- clinical presentation of renal disease 13–15, 16, 17, 220
 transplantation 224–5
- Clostridium difficile*, diarrhoea and vomiting 34, 35
- Cockcroft–Gault formula for glomerular filtration rate 17, **19**
- cold ischaemia time 202
- collecting duct 1, 3, 4, 5
- compartment syndrome 147
- compensation 149
- complement levels 19
- complement pathway 20
 haemolytic uraemic syndrome 89, 90
- computed tomography (CT) 23, 24
- confusion, diabetes mellitus type II 159–62
- coniine 147
- constipation, peritoneal dialysis 184–5, 186
- continuous ambulatory peritoneal dialysis (CAPD) 183, **184**
- contrast-induced nephropathy 125–6
- Coombs test 87
- corticosteroids
 in ANCA-associated vasculitis 59, 61
 in Goodpasture's disease 76, 77
 in IgA nephropathy 66, 67
 in lupus nephritis 82, 84
 in membranous glomerulonephritis 96
 in nephrotic syndrome 114, 116
 side effects 114
 in tubulointerstitial necrosis 70, 71
- costophrenic angle, blunted
 left 94, 95
 right 107
- coturnism 147
- cranberry juice 130
- creatinine kinase (CK) 147
 elderly woman with dark urine 144
- creatinine, serum level 2, 3, 17, 19, 227
 accumulation 28
 acute kidney injury 15
 chronic kidney disease 163
 post-renal transplant 201–9
 renal transplant rejection 205
- creatinine clearance 17, **19**
- C-reactive protein (CRP) 18
 peritoneal dialysis peritonitis 188
- crested glomerulonephritis 18, 58–61
 with haemoptysis 74–5
 immunostaining on renal biopsy 58

- with macroscopic haematuria 65–7
- pauci-immune 58
- prognosis 66–7
- renal biopsy changes 65–6
- secondary to Goodpasture's disease 74–7
- treatment 66
- critical ischaemia assessment 123–4
- cryoglobulinaemia 134
 - HCV-associated 135–7
 - renal biopsy changes 135
- cryoglobulins 19, 134, 137
- crystalluria 131, 132
- cyclophosphamide
 - in ANCA-associated vasculitis treatment 59, 61
 - in Goodpasture's disease treatment 76, 77
 - in IgA nephropathy treatment 66
 - causing macroscopic haematuria 63
 - in SLE treatment 82
- cystine stones 132
- cystitis, macroscopic haematuria 63
- cytomegalovirus (CMV)
 - allograft function 213, 214
 - owl eye inclusion bodies 213, 214
 - post-transplant infection 210, 211, 212–14
 - renal transplantation patient/donor 228
 - symptoms 214
- deafness, conductive 56
- dehydration 32
 - urinary tract infection 129
- delayed graft function (DGF) 202–3
- diabetes insipidus 45
- diabetes mellitus 10
 - glycosuria 45
 - renal impairment 151–3
 - type I
 - abdominal pain and vomiting 148–53
 - acid–base disturbance 149–50
 - anion gap 150
 - type II with confusion and hyponatraemia 159–62
- diabetic ketoacidosis 150
 - management 150–1
- diabetic nephropathy 151–3
 - dialysis 152–3
 - end-stage renal failure 152, 153
 - histopathological manifestations 152
 - prognosis 152, 153
 - renal replacement therapy 152–3
- diabetic retinopathy 151
- dialysis
 - indications in acute renal failure 40, 215
 - adequacy 174–5
 - in adult polycystic kidney disease 141
 - cardiovascular complications 174
 - complications 180
 - in diabetics 152–3
 - erythropoietin therapy 176
 - in Goodpasture's disease 76, 77
 - hypertension 175, 180
 - hypotension 173–4, 180
 - life expectancy 180
 - morbidity 180
 - myocardial infarction 178–80
 - survival curves 180
 - ultrafiltration rate 173
 - see also haemodialysis; peritoneal dialysis
- dialysis cachexia 174
- diarrhoea and vomiting 36
 - dehydration 32
 - fluid depletion 35
- diet, hypertension reduction 120
- disequilibrium syndrome 170
- distal tubule 1, 3, 4, 5
- dorsal pedalis pulse 123, 124
- drug history 9
- dysgammaglobulinaemia 20–1
- dysuria 8
 - urine dipstick abnormalities 128–32
- EDTA clearance 17, 19
- elderly patient, dark urine 143–7
- electrocardiogram (ECG)
 - hyperkalaemia 37, 38
 - hypertension 120
 - hypokalaemia 154, 155
- electrolytes
 - abnormal concentration in urine 22
 - glomerular filtration and tubular handling 2–3, 4
 - investigations 17–18
- electron microscopy, renal biopsy 25, 26, 27
- employment history 9
- encapsulating peritoneal sclerosis (EPS) 189–90, 191, 192
- end-stage renal failure (ESRF) 181–6
 - secondary to
 - chronic tubulointerstitial nephritis 70–1
 - diabetic nephropathy 152, 153
 - focal segmental glomerular sclerosis 111
 - haemolytic uraemic syndrome 90
 - lupus nephritis 82
 - minimal change glomerulonephritis 116
 - renal artery stenosis 125
 - small kidneys 171
 - treatment options 193, 200, 219
 - haemodialysis 176–80
 - peritoneal dialysis 181–6
 - transplant assessment 228
 - see also dialysis; renal replacement therapy; renal transplantation
- enoxaparin, diabetic ketoacidosis 151
- eosinophils, in urine 22
- Epstein–Barr virus (EBV), post-transplant malignancy 210, 211, 214
- erythrocyte sedimentation rate (ESR) 18–19, 47–8
 - hypercalcaemia 47–8
- erythropoietin
 - administration in anaemia 173
 - compliance with therapy 176, 177
 - production 6
 - resistance 176
 - side effects 176–7
 - therapy 176
 - headache 177
 - hypertension exacerbation 179
- erythropoietin deficiency, treatment 26, 28
- Escherichia coli*, urinary tract infection 128, 129, 132
- Escherichia coli* 0157:H7 88
- eyes, examination 10
- facial swelling 51–5
 - frothy urine 113–16
- factor H autoantibodies 88–9
- factor H deficiency 90
- factor I autoantibodies 88–9
- family history 10
- feet
 - examination 10
 - see also foot pulses
- fever, renal transplantation patient 210–14, 218
- fibroblast growth factor 23 (FGF23), chronic kidney disease 163–4
- fibromuscular dysplasia (FMD) 125, 126, 127
- flatus 99
- fluid balance
 - acute renal failure 29, 215
 - chart 146
- fluid depletion, diarrhoea and vomiting 35
- fluid overload 28
- shortness of breath 169
- fluid replacement
 - acute renal failure 29, 41, 215
 - oliguria post-transplant 201
 - see also intravenous fluids
- focal segmental glomerular sclerosis (FSGS) 10, 95, 97, 217
 - diagnosis 110
 - gene mutations 111–12
 - HIV-associated 111
 - idiopathic 110–11
 - management 110–11
 - obesity, associated with 110–12
 - presenting as nephrotic syndrome 217
 - prognosis 111
 - recurrence post-transplant 112
 - renal biopsy 25, 26, 110
 - secondary causes 111
- foot pulses 124
 - missing 123
- fresh frozen plasma (FFP), haemolytic uraemic syndrome 90
- fungal peritonitis 188, 189, 192
- ganciclovir 212, 213, 214
- gastro-oesophageal reflux 98–9
- giant cell arteritis 60
- glomerular basement membrane antigen 77
- glomerular filtration 2
- glomerular filtration rate (GFR) 2
 - abnormal 14–15
 - Cockcroft–Gault formula 17, 19
 - creatinine clearance 17, 19
 - creatinine serum level 17, 19
 - decline with ACEi 125
- glomerulonephritides 1, 18
 - clinical presentation 17, 18
 - infections associated with GN 21, 134
 - macroscopic haematuria 62
 - malignancy-associated 47

- glomerulonephritides (*cont.*)
 membranoproliferative 133, 135, 137
 membranous 95, 96, 97, 109, 217
 hepatitis B association 133, **134**
 prognosis 96, 97
 treatment 96
 mesangiocapillary 133, **134**, 135, 136, 137
 hepatitis C association 133, **134**
 minimal change 95, 113, 217
 in children 113–16
 disease associations 115
 relapse 114
 steroid-resistant 116
 treatment 114–15
 nephritic and macroscopic haematuria **16**, 62
 nephrotic syndrome **16**, 217
 post-infectious 21, 53–5
 red cell casts 22, 133
 renal biopsy 25, 26, 27
see also crescentic glomerulonephritis
- glomerulus 1, 3
 glucose 2, 3, 4
 impaired glucose tolerance 107
 glycosaminoglycans (GAG) 102, 104
 glycosuria 45, **156**
 Goodpasture's disease 74–7
 aetiology 77
 immunology tests 74–6
 plasma exchange 76
 prognosis 76, 77
 pulmonary haemorrhage 76, 77
 renal biopsy 74–5
 treatment 76
- haematuria 13–14, 21
 dark urine 144
 hypertension 227
- haematuria, macroscopic 14, 62–7, 138–42, 144, 227
 clinical examination 63–4
 crescentic glomerulonephritis 65–7
 differential diagnosis 62–3, 65
 investigations 64–6
 prognosis 66–7
 treatment 66
- haematuria, microscopic 14, 62, 141
 tubulointerstitial nephritis 69
- haemodialysis 28, 176–80
 cardiovascular event risk 179–80
 in chronic kidney disease 167, 168
 complications 175, 178, 176–180
 neurological deterioration 177–80
 in diabetics 152–3
 headache, associated with 177
 maintenance 172–3, 175
 patient examination 177
 peritoneal dialysis comparison 181, 186
 pulmonary oedema, indications 35
 review 173, 174
 in rhabdomyolysis 147
 vascular access 175
 line insertion 170–1
 tunnelled central line 171–3
- haemodynamic instability, post-renal biopsy 107
- haemolytic uraemic syndrome (HUS) 88–92
 diarrhoea, associated with 88, 90, 92
 management 89–90
 mutations, associated with 88, **89**
 non-diarrhoea-associated 88, 92
 pathogenesis 90
 prognosis 90
 renal biopsy findings 90
- haemoptysis with oliguria 72–7
 clinical examination 73
 differential diagnosis 72, **73**
 history taking 72–3
 investigations 73–5
 secondary to Goodpasture's disease 74–7
- hands, examination 10
- haptoglobin 87
- HbA1c 148
- headache
 haemodialysis, associated with 177
 with lethargy in a patient with atypical HUS 86–92
 and malaise secondary to ESRF and hypertension 163–8
- hearing loss 56–61
 clinical examination 56–7
- heart
 hypertension damage 119
see also cardiac *entries*
- heart sounds, quiet/inaudible 106
- hemlock alkaloids 147
- hepatitis B 21
 glomerulonephritis 137
 intravenous drug use 133
- hepatitis C 21
 cryoglobulinaemia 135–7
 glomerulonephritis 137
 intravenous drug use 133
 management 137
- hepatomegaly 101
- hepatosplenomegaly 99, 100, 101
- history taking 8–10
 past medical history 9
- HIV infection 21
 focal segmental glomerular sclerosis association 111
 glomerulonephritis, associated with 137
 intravenous drug use 133
- HIV-associated nephropathy (HIVAN) 111, 133, **134**
- horses, streptococcal infections 54
- human herpes virus 8 (HHV-8), post-transplant malignancy 210, **211**
- human leukocyte antigens (HLA)
 mismatch 228
 renal transplantation compatibility 195, 196
- human papilloma virus (HPV), post-transplant malignancy 210, **211**
- hydralazine, SLE association 84
- hydrogen ions 2
- hydroxychloroquine, SLE treatment 82
- hypercalcaemia 50, 218
 calcium urolithiasis **131**
 causes 45–6
- diagnosis 48
 examination 46
 history 46
 investigations 47–8
 management 48–9
 symptoms 45
- hypercalciuria 130, 131
 isolated **131**
 management 132
- hyperkalaemia 28
 in acute renal failure 37
 causes 38, **39**
 in diabetic acidosis 150
 as an indication for urgent dialysis 40
 ECG changes 37, 38
 in rhabdomyolysis 143, 147
 treatment 39
 insulin–dextrose infusion 37–8
- hypernatraemia 143, **144**
- hyperoxaluria **131**
- hyperparathyroidism
 in chronic kidney disease 7, 163–4, 167
 in dialysis patients 180
 primary 45
 secondary 6, 7, 45, 173
 tertiary 6, 7, 45–6
 treatment 28
 and vascular risk in dialysis patients 179–80
- hyperphosphataemia 8
 in chronic kidney disease 163–4, 166–7
 in dialysis patients 175
- hypertension 8, 13, 117–22
 in chronic kidney disease 164, 166
 classification 117, **118**
 diagnosis 117, 122
 in dialysis patients 174, 175, 180
 essential 117, 122
 and haematuria 227
 investigations 120
 left ventricular hypertrophy 119, **119**, 175
 lifestyle changes 120
 malignant 121
 morbidity risk factor 122
 organ damage, associated with 119, 119
 with peripheral oedema 227
 in post-infectious glomerulonephritis 51, 53, 54
 primary 122
 renal biopsy changes 119
 renal impairment 123–7
 secondary causes 117, **118**, 219
 treatment 26, 120–1, 122
- hypertensive retinopathy 119
- hyperuricaemia, management 132
- hypoadosteronism 157
- hypocalcaemia, chronic kidney disease 167
- hypocitraturia **131**
- hypokalaemia
 in diabetic ketoacidosis 150
 in renal tubular acidosis 154, 158
- hyponatraemia 218
 causes 159, **161**, **162**
 secondary to SIADH 159–62
- hyporeninaemic hypoadosteronism 157
- hypotension, dialysis 173–4

- hypovolaemia, renin release 45
hypoxia, haemoptysis with oliguria 74
- ibuprofen, tubulointerstitial nephritis 69
- IgA nephropathy 1, 17, 18, 21, 216
 crescentic 66–7
 pathogenesis 67
 post-infection flares 53
 prognosis 66–7
 recurrent 203
 treatment 66
- IgA1 aggregate deposition 67
- IgG, post-infectious glomerulonephritis 53
- IgG paraprotein 47, 50
- IgM, post-infectious glomerulonephritis 53
- imaging 22–4
- immune complexes 20
- immunoglobulin A (IgA) 19
 see also IgA nephropathy
- immunoglobulins 20–1
 see also named Ig's
- immunological investigations 221
- immunostaining
 in crescentic glomerulonephritis 74–5
 renal biopsy 25, 26, 27
- immunosuppression
 in treatment of ANCA-associated vasculitis 59
 infection risk 210, 211
 in treatment of membranous glomerulonephritis 96
 in renal transplantation 197–9, 200, 219
 side-effects 194, 199
- impaired glucose tolerance (IGT) 107
- infant polycystic kidney disease 142
- infections
 glomerulonephritides, associated 21
 line insertion, risk of 172, 175
 in renal transplantation patient 210, 211
 clinical examination 211–12
 prognosis 213
 see also urinary tract infection
- inflammatory markers 18–19
- infiximab 60
- insulin, intravenous 150
- insulin–dextrose infusion 37–8
- intercourse, voiding after 130
- interstitial nephritis, macroscopic haematuria 62
- intracranial pressure (ICP), monitoring 178
- intravascular volume
 overload 164
 status 174
- intravenous drug use 10
 chronic infections 133
- intravenous fluids
 in acute renal failure 41
 in diabetic ketoacidosis 150
 in hypercalcaemia management 48–9, 50
 in oliguria 33–4, 35
- intravenous urography 22
- inulin clearance 17, 19
- investigations 17–22
- iron deficiency, erythropoietin therapy 176
- joint pain, with rash 78–85
- Kaposi's sarcoma 210, 211
- kidney
 acute injury 15
 anatomy 1, 2, 3
 biochemistry 6, 7
 causes of dysfunction 22–5
 endocrine function 6, 7
 filtration 2
 glomerular function 1–2
 imaging 22–4
 physiology 1–3, 4, 5–6
- kidney cysts 142
 see also adult polycystic kidney disease (APKD)
- Kt/V 175
- laxatives 185, 186
- left axis deviation, hypertension 119
- left heart 'strain pattern' 119
- left ventricular hypertrophy 119, 119, 175
- legs
 bilateral oedema 93–7
 examination 10
 see also ankle swelling
- leuconychia 99, 100
- lifestyle changes, hypertension 120
- light microscopy, renal biopsy 24–5, 26, 27
- line insertion
 acute renal failure 169–70
 chest radiograph-post 170, 174
 infections, associated with 172, 175
 temporary 170–1
 tunnelled central line 171–3, 175
 vein stenosis/occlusion 172
- lisinopril, postinfectious glomerulonephritis 53–4
- livedo reticularis 134
- loin pain 8
- loop of Henle 1, 3, 4, 5
- lupus anticoagulant 82
- lupus nephritis 81–2
- lymphoma, post-transplant malignancy 210, 211
- magnetic resonance angiography (MRA) 23
- magnetic resonance imaging (MRI) 23
- major histocompatibility complex (MHC) 195, 196
 antigen presentation 208
- malignancy
 glomerulonephritides, associated with 47
 causing hypercalcaemia 45, 46
 in a renal transplantation patient
 clinical examination 211–12
 fever 210, 211
- malignant hypertension 121
- mean arterial pressure (MAP) 5, 6, 30
 determinants 124, 125
- mean corpuscular volume (MCV), macrocytic anaemia 86, 87
- medullary sponge kidney 142
- membrane attack complex (MAC) 19, 20
 haemolytic uraemic syndrome 89, 90
- membranous glomerulonephritis 93–97
 prognosis 96
 renal biopsy 25, 26, 27, 95
 treatment 94–96
- menstruation, macroscopic haematuria 63
- mesangiocapillary glomerulonephritis 133–137, 136
 prognosis 137
 renal biopsy 26
 treatment 137
- metabolic acidosis 149, 150, 153
 in chronic kidney disease 164
 with high anion gap 149, 217
 with normal anion gap 155
 secondary to renal tubular acidosis 155, 158
- metabolic alkalosis 149
- metastases, with hypercalcaemia 46
- microalbuminuria 22
 diabetic nephropathy 152
- microangiopathic haemolytic anaemia (MAHA) 87, 92
- microscopic polyangiitis 59, 60
- midstream urine (MSU) sample, dysuria with
 dipstick abnormalities 128
- minimal change glomerulonephritis
 in children 113–16
 disease associations 115
 renal biopsy 27
 treatment 114–15
- molecular mimicry
 ANCA development 61
 GBM antigen 77
- monoclonal antibodies 200
 in renal transplantation 197–8, 202, 211
- monogenic disorders 10
- mouth, examination 11
- mouth ulcers, rash with joint pain 79
- MR angiography, renal artery stenosis 125, 126
- mTOR pathway 141
- multiple endocrine neoplasia (MEN) 45
- multiple myeloma
 diagnosis 48
 prognosis 49–50
 renal biopsy 49
 renal impairment 47–48, 49
- mycophenolate mofetil 203
 in treatment of IgA nephropathy 66, 67
 in treatment of lupus nephritis 82, 84
 in renal transplantation 197, 198–9, 200, 202, 211
- myeloma *see* multiple myeloma
- myocardial infarction (MI)
 in a dialysis patient 178–80
 pulmonary oedema 127
- myoglobin 145, 147
 in urine 144
- nails, examination 10
- NaK2Cl co-transporter 5
- nephrectomy, laparoscopic 197
- nephrin 10
 mutations 111
- nephritic factors 135, 137

- nephritic syndrome 16, 17, 51–5
 differential diagnosis 51, 52
 history 51
 investigations 52–3
- nephritis plasmin-binding protein (NPBP) 54
- nephritis strain-associated protein (NSAP) 54
- nephrocalcinosis 131
 hypercalcaemia 47
- nephrogenic systemic fibrosis (NSF) 125
- nephron 1, 3
- nephropathy, contrast-induced 125–6
- nephrostomy, outflow obstruction 41
- nephrotic syndrome 15–16, 216
 causes 100, 107
 in children 113–16
 complications of 96
 diagnosis 94, 97
 frothy urine 113
 glomerulonephritides, associated with 18, 217
 investigations 94, 95, 101, 107
 with leg oedema 94
 management 107, 108, 109
 renal biopsy 97, 101, 102, 107, 108
 children 113–14, 116
 screening 107
 secondary causes 107
 secondary to
 amyloidosis 102, 104
 focal segmental glomerular sclerosis 106–112, 217
 obesity-related glomerulopathy 107
 steroid-resistant minimal change 111–12
 treatment 94–5, 96
- nervous system examination 11–12
- neutrophil leucocytosis 188
- nitrite, urine dipstick test 128, 129
- nocturia 8
- non-steroidal anti-inflammatory drugs (NSAIDs) 69
- nuclear factor of activated T cells (NFAT) 207
- nuclear medicine scans 24
 outflow obstruction 41
- obesity
 ankle swelling 106–12
 BMI 106
 pregnancy test 106
- obesity-related glomerulopathy (ORG) 109–11, 112
- Occam's razor 78
- occupational risk
 ANCA-associated vasculitis 61
 post-streptococcal glomerulonephritis 54
- octreotide, in treatment of adult polycystic kidney disease 141
- oedema
 bilateral of legs 93–7
 proteinuria with obesity 106–7
see also peripheral oedema; pulmonary oedema
- oliguria 8, 30, 31, 32–6
 with haemoptysis 72–7
 history taking 30, 31, 32
- investigations 32
- post-renal transplant 201, 209
- oncotic pressure, reduction 93, 106
- outflow obstruction
 causing acute renal failure 40–1
 causes 42
 dilation patterns 42
 nuclear medicine scan 41
 urinary catheterisation 41, 43
- papilloedema 119
- paraprotein 20–1
- parathyroid adenoma 45
- parathyroid hormone (PTH) 6, 7
 chronic kidney disease 163–4
 hypercalcaemia 45
- parathyroid hormone-related protein (PTHrP) 46
- patient examination 10–12
- patient management 224
- periorbital oedema 113
- peripheral oedema 106–7
 hypertension 227
 nephrotic syndrome in children 113
- peripheral vascular disease, antihypertensive agent contraindication 124
- peritoneal dialysis 28
 abdominal pain 187–92
 automated 183, 184
 catheter insertion 181–2, 186
 catheter repositioning 185
 complications 185, 186, 189–90, 191, 192
 constipation 184–5, 186
 continuous cyclic 183, 184
 diabetic nephropathy 152–3
 end-stage renal failure 181–6
 fluid
 administration 183, 184
 composition 182–3
 drainage problems 184, 185
 volume 183
 manual 183, 184
 nightly intermittent 183, 184
 regimen 182–4
 in treatment of chronic kidney disease 167
- peritoneal dialysis peritonitis 187–92
 causative organisms 188–9, 192
 culture-negative 188–9
 fungal 188, 189, 192
 investigations 188
 prevention 189
 treatment 189
- petechiae 86
- phosphate 3
 hypercalcaemia investigations 47
see also hyperphosphataemia
- phosphate binders 174
- PKD gene mutations 10, 138, 142
 screening 140
- plain abdominal radiography 22
- plasma exchange
 in treatment of
 ANCA-associated vasculitis 59
 Goodpasture's disease 76, 77
- multiple myeloma 49
- acute humoral rejection 206
- Pneumocystis jiroveci* pneumonia (PCP), post-transplant infection 210, 211, 214
- podocin 10
 mutations 111–12
- podocyte slit diaphragm 112
- podocytes 1, 2, 3
 foot process fusion 114, 115
- polyarteritis nodosa 60
- polycystic kidney disease (PKD) 6, 99
see also adult polycystic kidney disease
- polycystin-1 141
- polycythaemia 6
- polydipsia
 back pain 45–50
 examination 46
 history 46
 investigations 47
- polygenic disorders 10
- polyuria 8, 45
- polydipsia 45
- Ponticelli regime, in treatment of membranous glomerulonephritis 96
- porphyria, dark urine 144
- posterior tibial pulse 123, 124
- post-infectious glomerulonephritis 21
 diagnosis 53
 management 53, 55
 public health 54
 renal biopsy 53, 55
- post-streptococcal glomerulonephritis 21, 54
- post-transplant lymphoproliferative disorder (PTLD) 214
- potassium ions 2, 4
 diabetic acidosis 150
- potassium levels
 in diabetic ketoacidosis 150
 in renal failure 28
see also hyperkalaemia; hypokalaemia
- potassium therapy, renal tubular acidosis 156
- preabsorbing antigen (PAAg) 54
- prednisolone 197, 198–9, 200, 202, 203, 211
 renal transplant rejection 205, 206
- pregnancy test
 dysuria with dipstick abnormalities 128
 obesity 106
- pre-renal failure 33, 34, 36
- procainamide, SLE association 84
- prostate tumours, macroscopic haematuria 63
- prostatitis 132
- protein, urine dipstick 133–7
- protein/creatinine ratio 22
 selective excretion 113
- proteinuria 13, 21, 22
 in diabetic nephropathy 152
 frothy urine 113
 in nephrotic syndrome 100
 in obesity-associated glomerulopathy 106–7
 with oedema 227
 treatment 26
 in tubulointerstitial nephritis 69
- proton pump inhibitors (PPIs), tubulointerstitial nephritis 69, 71
- proximal tubule 1, 2–3, 3, 4, 5

- pseudohyperkalaemia **38**
public health, post-infectious
 glomerulonephritis **54**
pulmonary haemorrhage, Goodpasture's disease **76, 77**
pulmonary oedema **35**
 as an indication for dialysis **40**
 flash **127**
 in renal artery stenosis **126–7**
 in end stage renal failure **169, 170**
pulmonary–renal syndrome **73, 216**
pyelonephritis **132**
 macroscopic haematuria **62**
- quail consumption **147**
- radiological investigations **22–24, 221, 222**
- rash
 causes **78, 79**
 examination **10**
 petechial **86**
 secondary to cryoglobulinaemia **134**
rash with joint pain **78–85**
 clinical examination **79–80**
 diagnosis **80–1**
 history taking **78**
 mouth ulcers **79**
 secondary to systemic lupus erythematosus **80–2, 83, 84**
- rash with renal impairment **68–71**
 history **68–9**
 secondary to tubulointerstitial nephritis **69–71**
- red cell casts **133, 215**
renal angiography, post-renal biopsy bleed **109**
renal arteries **1, 2**
renal artery stenosis (RAS) **125**
 atherosclerosis **124, 127**
 imaging **125**
 investigations **125**
 management **126**
 pulmonary oedema **126–7**
 renal function decline **125–6**
 treatment **127**
- renal biopsy **24–5, 26, 216, 222, 222–3**
 acute renal failure **69**
 acute tubular necrosis **33**
 crescentic glomerulonephritis **65–6**
 cryoglobulinaemia **135**
 Goodpasture's disease **74–5**
 hypertension **119**
 multiple myeloma **49**
 nephrotic syndrome **97, 101, 102, 107, 108**
 children **113–14**
 post-infectious glomerulonephritis **53, 55**
 procedure **203–4**
 renal transplantation **203–4, 205, 209, 225–6**
 systemic lupus erythematosus **81**
- renal calculi *see* renal stones
renal cell carcinoma (RCC) **6**
renal colic **8**
renal failure
 chronic **215**
 haemolytic uraemic syndrome **88, 92**
 lethargy and malaise **228**
 potassium levels **28**
 shortness of breath **169**
 treatment **25–6, 28, 29**
 underlying causes **28**
 see also acute renal failure (ARF); end-stage renal failure (ESRF)
- renal function, chronic kidney disease **193**
renal impairment
 in diabetics **151–3**
 diagnosis **220**
 and hearing loss **57**
 in hypercalcaemia **47**
 in multiple myeloma **48, 49**
 with rash **68–71, 80**
 with joint pain **80**
 secondary to
 hypertension **123–7**
 rhabdomyolysis **144**
- renal replacement therapy (RRT) **28**
 in adult polycystic kidney disease **141, 228**
 in diabetics **152–3**
 options **186**
 review **173**
 see also named modes, haemodialysis, peritoneal dialysis, transplantation
- renal stones **8, 130–2, 218**
 hypercalcaemia **47**
 investigations **131**
 macroscopic haematuria **62**
 management **131–2**
 types **130, 132**
 uric acid **131**
- renal transitional cell carcinoma **71**
renal transplantation **28, 186**
 altruistic donor **193**
 anaesthetic risk **194**
 assessment clinic **228**
 Banff classification of rejection **208**
 complications **224–5, 208**
 creatinine level rise **201–9**
 deceased donor **193**
 in diabetics **153**
 donor compatibility **195, 196, 197**
 donor renal function **195**
 fever **210–14, 218**
 clinical examination **211–12**
 investigations **212**
 focal segmental glomerular sclerosis
 recurrence **112**
 hospital stay duration **197, 209**
 immunosuppression **197–9, 200, 219**
 side-effects **194, 199**
 infection **210, 211**
 clinical examination **211–12**
 prognosis **213**
 living donor **193, 195, 196, 197, 200**
 malignancy **210, 211**
 clinical examination **211–12**
 oliguria **201**
 rejection **203, 205, 209**
 acute cellular **205, 207, 207, 209, 226, 237**
 antibody-mediated **206, 208, 226, 237**
 immunological mechanisms **207–8**
 types **206**
 renal biopsy **203–4, 205, 209, 225–6**
 technical issues **203**
 technical requirements **194**
 work-up **173, 194**
 renal tubular acidosis **155–7**
 distal **156, 158, 218**
 prognosis **156–7**
 types **156, 157**
 renal tumours, macroscopic haematuria **62**
 renal veins **1, 2**
 renin–angiotensin–aldosterone (RAA) pathway **5–6**
 polydipsia **45**
 respiratory acidosis **149**
 respiratory alkalosis **149**
 respiratory system examination **11**
 reticulocytes **87**
 retinopathy, hypertensive **119**
 rhabdomyolysis **144, 145–7, 218**
 causes **145**
 historical description **147**
 prognosis **147**
 rheumatoid factor **19**
 rifampicin, dark urine **144**
 Rinne's test **56**
 rituximab **60**
- salbutamol **39**
salicylate overdose **217**
schistosomiasis, macroscopic haematuria **63**
serum amyloid P (SAP) **102, 103, 104**
shigatoxin **88, 91, 92**
shortness of breath **169–75**
simian virus (SV) **40, 204, 205**
skin rash *see* rash
small vessel vasculitis **58–61, 60**
 see also ANCA-associated vasculitis
 smoking history **10**
 social history **9–10**
sodium ion channels **4, 5**
sodium ions **2, 4**
 in acute tubular necrosis **34**
 tubular resorption **5**
sodium levels
 hypernatraemia **143, 144**
 see also hyponatraemia
Staphylococcus aureus **188, 189, 192**
 ANCA-associated vasculitis **61**
steal syndrome **175**
streptococcal infections
 horses **54**
 see also post-streptococcal glomerulonephritis
Streptococcus epidermidis **188**
syndrome of inappropriate antidiuretic hormone secretion (SIADH) **159–62**
 causes **161**
 management **161–2**
systemic lupus erythematosus (SLE) **10, 80–2, 83, 84, 216**
 aetiopathogenesis **82, 83, 84**
 autoantibodies **81, 82, 83, 84**
 diagnostic criteria **80**
 environmental factors **84**
 genetic factors **82, 84**

- systemic lupus erythematosus (SLE) (*cont.*)
 investigations 81
 management 81–2
 prognosis 82
 renal biopsy 81
 systems review 9
- T cell activation 207
 tacrolimus 197, 198–9, 200, 202, 203
 Takayasu's arteritis **60**
 Tamm Horsfall protein 145
 temperature, body 10
 thrombocytopaenia **87**
 haemolytic uraemic syndrome 88, 92
 thrombotic thrombocytopenic purpura (TTP)
 91, 92
 Toll-like receptors (TLRs) 84
 tolvaptan, in treatment of adult polycystic
 kidney disease 141
 toxic megacolon 32
 trauma
 macroscopic haematuria 63
 rhabdomyolysis **145**
 troponins, dialysis patient 178, 179,
 180
 TSC2 141
 tuberin 141
 tuberous sclerosis **142**
 tubular disorders 28
 tubules, surface pumps 2
 tubulointerstitial nephritis (TIN) 68
 acute 70
 causing acute renal failure 69–71
 chronic 70–1
 drugs associated 69, **70**
 infections associated 70
 prognosis 70
 renal biopsy 69, 70, 71
 treatment 70
- ultrasound 22–3
 uraemia 8
 dialysis 40
 urate stones 132
- urea 2, 4
 accumulation 28
 elevated levels 17, **19**
 urea reduction ratio (URR) 175
 ureter 1, 2
 ureteral malignancy, macroscopic haematuria
 63
 ureteral stones, macroscopic haematuria 63
 ureteric stents 203, 205
 urethra 1, 2
 urethral outflow obstruction 40–1
 uric acid 2, 3
 urinary catheterisation
 macroscopic haematuria 63
 outflow obstruction 41, 43
 urinary frequency 8
 urinary tract infection
 causes 128, **129**
Escherichia coli 128, 132
 investigations 130
 management 132
 nitrite presence 128
 organisms 218
 post-transplant infection 210, **211**
 recurrent 129–30, 132
 urine tests 21–2
- urine
 abnormalities 8
 alkalinisation 147
 appearance 221
 casts 22
 colour 8
 dark colouration 51–5, 143–7
 causes 144
 electrolyte abnormal concentration 22
 frothy with facial swelling 113–16
 leucocytes 128, 129
 microscopy 21–2
 myoglobin 144
 nitrite 128, 129
 normal volume 2
 osmolality 22
 output chart 30, 31
 protein quantification 22
 reduced output 30–6
 specific gravity 22
 tests 21–2, 221
 urine dipstick abnormalities 13–14
 dysuria 128–32
 nitrite 128
 protein and blood 133–7
 urine dipstick test 21–2
 urolithiasis **131**
- valganciclovir 212, 214
 vancomycin, peritoneal dialysis peritonitis 189
 vasculitis 58–9
 with anti-GBM antibodies 76
 classification **60**
see also ANCA-associated vasculitis
 vasopressin *see* antidiuretic hormone (ADH)
 vein stenosis/occlusion, line insertion 172
 venous thromboembolism,
 risk with diabetic ketoacidosis 151
 risk with membranous GN 96
 verocytotoxin 88
 vitamin D
 chronic kidney disease 164, 167
 deficiency
 dialysis 175
 treatment 28
 metabolism 6, 7
 renal bone disease 163
 25,OH-vitamin D 6, 7
 voiding, double 130
 von Hippel–Lindau syndrome **142**
 von Willebrand factor 91
- warfarin, lupus nephritis 82
 warm ischaemia time 202
 water, glomerular filtration 2, 4
 Wegener's granulomatosis 58, 59, **60**
 prognosis 60–1
see also ANCA-associated vasculitis
 weight loss, hypertension reduction
 120
 wheeze 228
 white blood cells in urine 21