

Cambridge University Press

978-1-107-60965-5 - Artificial Nutrition Support in Clinical Practice: Second Edition

Edited by Jason Payne-James, George K. Grimble and David B. A. Silk

Index

[More information](#)

Index

Note: page numbers in bold refer to tables

- abdominal distension
 - EN-related 339
 - incidence rates 337
 - enteral feeding contraindication 296
- abetalipoproteinaemia, predigested elemental diet 311
- abscesses, intra-abdominal wall, PEG complications 290
- acetoacetate (AcAc)
 - hepatic synthesis 83
 - and 3-hydroxybutyrate (beta-OHB) **11–13**
- acetylcoenzyme A (CoA)
 - AcCoA/CoA ratio 3, 10
 - hepatic synthesis 84
- acridine orange leucocyte cytospin test, catheter-related sepsis diagnosis 387
- acrodermatitis enteropathica, zinc deficiency 140
- actinomycin D
 - chemotherapy combination 653
 - mucositis 652
 - recall reaction 653
- acute phase proteins
 - C-reactive protein 18–19
 - in injury and sepsis, positive and negative phase **18**, 19–20
 - serum albumin, zinc and iron **206**
 - smoking 101
- adipose tissue
 - brown/white, MR **66**
 - elderly people 688
- adrenaline
 - infusion, overnight fasted vs 48 h starvation **67**
 - injury and sepsis 71–2
 - thermogenesis 67–8
- adriamycin
 - mucositis 652
 - radiotherapy combination 653
 - recall reaction 653
- aerobic/anaerobic metabolism 68–9
- ageing
 - muscle protein turnover 48–9
 - physiological changes 683
 - population trends 683
 - vitamin B12 deficiency 109
 - see also* elderly patients
- AIDS *see* HIV infection and AIDS
- airway abnormalities, FBT placement 285
- airway obstruction, feeding tubes 336
- alanine 17–18
 - metabolism, inhibition by xylitol 423–4
- albumin
 - changes, acute phase response 18–19, **206**
 - hepatic synthesis 85
 - hypoalbuminaemia, enteral feeding intolerance 338
 - as marker of ECW changes 173
 - monitoring, EN 296
 - negative acute phase response 19–20
 - protein–energy malnutrition 222
 - in starvation, short term **20**
 - and visceral proteins, assessment 169–70
- alcohol, catheter occlusion clearance 388
- alcohol misuse
 - fatty acids 86
 - hypoglycaemia 86
 - lipase inhibition 87
 - lipid metabolism 86–7
 - malnutrition 86
 - megaloblastic anaemia 87
 - thiamine deficiency 109
 - vitamin deficiencies 686
 - see also* hepatic disease
- algorithms, hyperalimentation, pancreatitis **728**
- alkalosis, hepatic encephalopathy 89
- allergic disease, and n-6 PUFAs 99–100
- alpha-2-macroglobulin, and protein 101–2
- ¹³C-alpha-ketoisocaproate labelling, protein turnover measurement 44–5
- aluminium 474
 - HPN solutions 493
- amino acids
 - analysis 29–31
 - intracellular measurements 30
 - intramuscular measurements 31
 - radioactive and stable-isotope tracers 29–30
 - snapshots of metabolism 30–1
- arteriovenous (A–V) differences 32
- branched chain (BCAA) 83, 517
- cancer therapy 666
- hepatic encephalopathy enteral diets 89, 320–1
- hepatic regeneration 90
- plasma concentrations, hepatic disease 88
- cancer cachexia 647
- in catabolic response to injury 17–18
- catabolism 43, 84–5
- conditionally essential 41
 - protein turnover modification 46
- cytokine biology 101–2
- depletion, injury and sepsis 516–17
- determination of body composition 28–9
- dispensable/non-dispensable, classification 40–1
- essential, requirements **183**
- feeding effects 28
- formula for infants 356
- free pool
 - composition 38
 - membrane transport 37–9
 - protein balance 39
 - size regulation 39
- gluconeogenesis 83

INDEX

- amino acids – *continued*
 homeostasis, glutamine 408, 416
 hormonal stimulation 85
 hypercalcaemia, PN 453–4
 imbalance, anorexia 643
 immune function 139–41
 infants, blood composition 472
 intermediary metabolism 84–5
 abnormalities 88–9
 Krebs cycle activity 41
 protein turnover relationship 39–41
 schema 40
 urea excretion 84
 limbs, splanchnic bed and blood exchange 32
 muscle fluxes, feeding/starvation effects 32–3
 N-acetylated 417–18
 as oral supplements, palatability 272
 precursor labelling 35–7
 flooding dose method 36–7
 recommended intakes 42–3
 source, lipid emulsion stability 438
 ‘tertiary amino acid transport’ 39
 tissue-specific metabolism 42–3
 tracers
 dilution technique 33–4
 flooding dose method 36–7
 GC–MS assessment 35
 protein incorporation 34–5
 constant infusion method 34, 44
 protein turnover information 32–3
 tracer/tracee free pool relationship 36
 transporter proteins
 characteristics 38
 identification and isolation 38
 transporter systems, regulatory role 39
 venous pattern 43
 venous transport 39
 see also named amino acids; proteins
 aminoacyl-tRNA labelling 34–5
 ammoniogenesis, glutamine substrate 322
 anabolic agents, amino acid transport defect reversal 158
 anabolic steroids, protein turnover effects 48
 anaemia *see* megaloblastic anaemia
 anaerobic metabolism 68–9
 anorectic peptides, food intake, appetite control 236
 anorexia 102, 236–7
 of ageing 689
 amino acid imbalance 643
 cancer cachexia 642–3, 651–3
 cytokines 102, 228
 learned food aversion 643, 651
 anthropometry, paediatric nutrition assessment 221–2
 antibiotics
 catheter infections 476
 coated catheters 383
 diarrhoea association 124
 intrahepatic cholestasis 491
 prophylactic, PEG 290, 693
 anticachectics 665–7
 anticoagulants, CVT 490
 antidiarrhoeal drugs 338, 712
 antioxidants
 catabolic patients 159
 examples 100
 modulation of cytokines 100–1
 antiretroviral agents
 dietary recommendations **627**
 HIV infection 619
 antisecretory drugs, jejunostomy 711–12
 apoptosis, taurine modulation 407
 appetite control 225–39
 body weight stability 228–9
 and disease, immune response 95
 dysregulation, elderly people 683–4, 687
 hypothalamic control of energy balance **227**, 232–3
 leptin 230–2
 long-term regulation of body weight 229–32
 lipostat theory 230
 ob protein and *ob* receptor in mice 230
 peptides and neurotransmitters
 increasing food intake 233–4
 galanin 234
 melanin-concentrating hormone 234
 neuropeptide Y 233–4
 other peptides 234
 peptides and neurotransmitters
 reducing food intake 233–4
 corticotrophin-releasing factor 235
 melanocyte-stimulating hormone 235
 other anorectic peptides 236
 serotonin 235
 short-term regulation 236
 see also anorexia
 arginine 599
 immune response modulation 322
 insulin stimulation 125
 intestine utilisation 125
 lysine deprivation 406
 properties 139
 protein nutrition substrate 405–6
 surgical patients 611
 tumour protein synthesis increase 46
 uptake in cystinuria 114
 arteriovenous catheterization, burn injury 17
 ascites
 complications of liver disease 506
 FPG 291
 ascorbic acid *see* vitamin C
 aspiration, enteral nutrition risks 338–9, 373–4, 547
 and neurologic deficit 338
 prophylaxis 339
 recumbency 286
 aspiration pneumonia 295, 338
 assessment of nutrition 165–76
 aims 167–8
 elderly people 690–1
 history 167
 methods 168–73
 albumin and visceral proteins 169–70
 body fat 169
 body water compartment volume 171–3
 hand grip strength **170**
 muscle protein 170–1
 prognostic indices 173–4
 whole-body 168–9
 proposal for parameters **174**
 ATP, short term starvation 3
 atrophic gastritis, elderly people 685–6
 audit *see* hospital audit
 aversive feeding behaviours (AFB), elderly people 691
 azotaemia 453
 bacterial translocation
 GI epithelium
 animal studies 765
 human studies 765–7
 multi-organ failure 610
 post-operative sepsis 766
 basal metabolic rate (BMR) 3, **9–10**
 elderly people 684
 injury and sepsis 13–15
 and RMR 260
 see also resting energy expenditure (REE); total available energy (TEE)

- beta blockers 72
- bicarbonate–urea method,
measurement of MR 65, **65**
- bile, and vitamin absorption 85
- bile acids
cholesterol 84
synthetic 714
- biliary dysfunction, HPN 491–3
- biliary obstruction, predigested
elemental diet 311
- biliary sludge and stones, HPN
related 491–2
- bioelectric impedance analysis (BIA)
172, 505
- biotin, RDA/effects 202–3
- bleomycin
mucositis 652
radiotherapy combination 653
- blood culture, catheter-related sepsis
diagnosis 387
- BMI *see* body mass index
- body cell mass, cancer patients, TPN
and EN effects 654–5
- body composition
determination 28–9
DEXA 505
fuel availability and survival time,
lean vs obese **6**
pre/post resuscitation, PEM **594**
- body fat
assessment 169
BMR, protein oxidation,
prolonged starvation **9**
brown/white adipose tissue **66**
metabolism, TNF-alpha and IL-1
649
oxidation/turnover
activity and energy cost, burn
injury **16**, 72
modulation of cytokines 98–100
oxygen consumption and RQ
68
sepsis, low and high REE, with
i.v. glucose **74**
synthesis 69
standardizations of MR
measurements and values,
predictive equations, resting
MR, same height, different
BMI **66**
see also lipids
- body impedance analysis (BIA) 172,
505
- body mass index (BMI)
ageing 683
BMR, protein oxidation,
prolonged starvation **9**
- fat free mass (FFM), and MR 65
- influence of disease, REE 181
- metabolism/metabolic rate,
predictive equations **66**
- nutrition category definition 151
- standardizations of MR
measurements, resting MR
66
- body surface area (BSA), nomogram
580
- body water compartment volume
albumin as marker of ECW
changes 173
assessment 171–3
body impedance analysis 172
clinical examination 172
dilution techniques 172
extracellular water volume 171
- body weight stability 228–9
AIDS 228
cancer 229
chronic inflammatory conditons
228
gain/loss prognosis 169
leptin 229–32
long-term 229–32
see also anorexia; appetite control;
obesity
- bombesin, appetite control 236
- bone disease
HPN related 492–3
inappropriate nutrients in PN
454–5
osteomalacia, vitamin D-induced,
HPN related 87, 492
osteoporosis
calcium intake 687
chronic hepatic disease 87
HPN related 492–3
vitamin D deficiency 87
- bone marrow transplantation, TPN
664
- bowel transplantation, short bowel
714
- brain, MR **66**
- brain injury, nutritional support,
ethical dilemmas 693–4
- breast feeding 42, 220
HIV infection 633
- breast milk 354
- British Artificial Nutrition Survey
369–71
- brush border *see* enterocyte brush
border
- burn injury 575–89
amino acids, catabolic response
17–18
anabolic agents 588
- EN 149, 585–6
commercial enteral feedings **587**
energy goals **578**, 580–1
metabolic energy expenditure
(MEE) of adults **582**
metabolism/metabolic rate
71–3
nomogram, body surface area
(BSA) **580**
predictions of energy needs,
BSAB **581**
fat turnover **16**, 72
fluid requirements and resuscitation
577–80
glucose oxidation **16**, 72
hyperglycaemia 17
nitrogen metabolism **16**
nutritional immunomodulation
586–8
protein goals **578**, 581–2
protein turnover **16**, 72
TPN 582–5
adolescents and adults 585
crystalloid central PN (CPN)
solutions **584**
infants/young children 585
infusion rates and remaining
energy deficit **583**
see also injury and sepsis, metabolic
response
- button devices, gastrostomies and
jejunostomies 293, 358
- butyrate, colonic epithelium trophic
effects 315–16
- ¹³C-alpha-ketoisocaproate labelling,
protein turnover
measurement 44–5
- cadmium, excess 141
- calcium
age and RDA 219
deficiency 140, 453–4
as glycerophosphate 473
and osteoporosis 687
sources, paediatric PN 473
calcium phosphate, PN mixture
precipitation 439–40
Calman modular training 251
calorimetry, measurement of energy
expenditure, direct and
indirect 181
- cAMP *see* cyclic adenosine
monophosphate
- cancer, *see also* tumour cells
- cancer, nutrition support 156–7,
639–80
aetiology and pathogenesis of
cancer cachexia 642–50

Cambridge University Press

978-1-107-60965-5 - Artificial Nutrition Support in Clinical Practice: Second Edition

Edited by Jason Payne-James, George K. Grimble and David B. A. Silk

Index

[More information](#)

INDEX

- cancer, nutrition support – *continued*
 appetite stimulant substances and anticachectic drugs 665–7
 arginine adjunctive therapy 125
 cancer vs non-cancer patients 656
 catabolic factors 650–1
 chemotherapy and radiotherapy 655
 children, nutrition status 642, 654
 clinical outcome 657–63
 defective starvation adaptation 644
 definition 641
 future developments 665–7
 glucose uptake increase 645–6
 glutamine supplementation 668–9
 historical background 641
 hypophagia and anorexia theory 642–3
 iatrogenic malnutrition 651–3
 prognostic impact 653–4
 immune dysfunction 142–3
 lactic acid increase 645
 malnutrition, incidence rates 642
 mechanisms 649–50
 metabolic abnormalities 643–50
 metabolic competition theory 642
 metabolic manipulation 669
 mortality rates 654
 nutrient modulation 667–8
 nutrition regimen 664–5
 nutrition status effects 654–7
 omega-3: omega-6 fatty acids 158–9
 oral supplements 275–6
 paediatrics 353
 prevalence of cachexia 641–2
 protein turnover 658
 quality of life and performance status 660
 surgical intervention 657–9
 TPN 661–2
 complications 663–6
 vs EN, pre- and postoperative 658–9
 home TPN and EN 664
 outcome effects 659–60
 vs standard oral diet 655
 tumour growth 661–3
 weight loss and tumour type relationship 641–2
Candida, catheter-related infections 386
Candida albicans, PEG tube colonisation 290
 carbohydrates
 assimilation 126
 predigested elemental diets 318
 rate-limiting steps 118–19
 digestion and absorption 117–22, 126
 EN 120
 enterocyte brush border 118
 monosaccharide transport 119–20
 and fibre, elderly population requirements 685
 homeostasis 83
 hydrolysis, luminal and brush border alpha-glucosidases 118–19
 metabolism
 abnormalities 86
 cancer cachexia 645–6
 cytokine mediation 647–8
 hepatic 83–4
 oxygen consumption and RQ 68
 total kJ in storage 69
 paediatric requirements 217, 469
 in respiratory failure 545
 sources, paediatric PN 469
 cardiac arrhythmias, risk reduction, n-3 long-chain fatty acids 422
 cardiac function
 nutrition depletion effects 607
 protein turnover effects 46
 cardiac MR 66
 cardiomyopathy
 congenital heart disease (CHD), indications for paediatric EN 353–4
 selenium depletion 156
 selenium-related, HPN 490
 cardiopulmonary disease, enteral diets 307
 L-carnitine 472
 deficiency 597
 casein
 feeding tube blockage 112
 tube obstruction association 336
 cat, prolonged starvation, percentage loss of organs 5
 catabolic factors
 antioxidants 159
 cancer cachexia 650–1
 LMF 650
 PMF 650–1
 catecholamines
 and cytokines 97
 protein turnover effects 48
 catheters
 care 395–6
 catheter-related sepsis 386–7
 central vein thrombosis (CVT) 490
 HPN 489–90
 line or hub fracture 490
 tunnel swelling 490
 central venous 382–5, 474–5
 complications
 mechanical 476
 paediatric PN 475–6
 cyclical infusions 393–5
 exit sites 395–6
 historical notes 381–2
 implantable devices 384
 infections 243, 386–7, 476
 insertion 395–6
 complications 386
 support team roles 244
 technique 385–6
 jejunostomy
 cuffed-tube (CTJ) 293
 needle catheter (NCJ) 292–3
 material 382–3, 395
 occlusion 387–8
 peripherally inserted central catheters (PICCs) 384–5
 PVT risks 391–2
 safer IV feeding 243–4
 single lumen vs multi-lumen 384
 tunnelling 385
 ultrafine, PPN 393–5
 cellular hydration, glutamine effects 413
 central vein thrombosis (CVT), catheter-related sepsis 490
 cerebral palsy, indications for EN 351–2
 cerebrospinal fluid, leptin 232
 cerebrovascular disease
 enteral tube feeding 159
 stroke
 gastric atony 309
 nutritional support 691–2
 chemical pathologist/biochemist, team role 246
 chemotherapy
 cancer, glutamine supplementation 412
 and radiotherapy combination, cytotoxicity 653
 side effects 652–3
 TPN, and EN 655, 659–60
 chenodeoxycholic acid 477
 chinidin, diarrhoea association 338
 cholecystokinin (CCK) 159, 236, 477
 cholecystokinin–octapeptide therapy, HPN related biliary sludge and stone 491–2
 cholestasis
 intrahepatic, HPN related 491
 lipoprotein X 87

- paediatric PN 477–8
 taurine-enriched HPN 491
 cholesterol 99
 bile acid synthesis 84
 hepatic synthesis 84
 n-6 PUFAs 99–100
 cholestyramine, and vitamin D
 deficiency 87
 cholic acid 477
 cholylsarcosine 714
 chromium
 age and RDA 219
 deficiency 450
 RDA/effects 204–5
 chronic pulmonary disease *see*
 respiratory disease
 chylomicrons, lipid transport 123
 cimetidine, PN formulation 440–1
 cisapride, gastric emptying 287
 clinician, team role 246
Clostridium difficile,
 pseudomembranous colitis
 338
 CO₂, protein turnover measurement
 32
 co-carboxylase, degradation,
 bisulphite 440
 coagulation system
 hepatic disease 88–9
 protein synthesis 85
 vitamin K deficiency 87–8, 89
 coagulopathy 448
 codeine phosphate, diarrhoea
 treatment 338
 coeliac disease, dietary LCT and
 MCT 127
 colitis, fish oil preparations 420
 colon
 preserved, short bowel 707–9
 radiotherapy effects 653
 colonic absorption, short bowel 705,
 705
 colonic anastomosis, fibre and SCFA
 effects 316
 commercial drinks/liquid
 supplements, energy and
 protein content **271**
 computer-assisted TPN, Fresenius
 Kabi nutrition programme,
 paediatric PN **470**
 congenital heart disease (CHD),
 indications for paediatric
 EN 353–4
 constipation
 EN-related, incidence rates 337,
 338
 fibre and EN 314, 337, 338
 hepatic encephalopathy 89
 continuous arteriovenous
 haemofiltration, intra-
 dialytic PN 532
 copper
 age and RDA 219
 deficiency 140, 449
 incidence rates 341
 RDA/effects 204–5
 supplement 474
 Cori cycle 76
 energy expenditure increase 645
 corticosteroids
 adrenal, amino acid stimulation 85
 cancer therapy 666
 protein turnover effects 47
 corticotrophin-releasing factor, food
 intake, appetite control 235
Corynebacterium, tunnelled catheter
 infections 386
 cost-effectiveness of treatment
 733–51
 audit *see* hospital audit
 causes of disease-related
 malnutrition 735, **738**
 clinical benefits 739, 741–3
 complete EN 741, 743
 oral supplements, sip feeds 741,
 742
 PN 743
 supplementary enteral tube
 feeding 741
 health economics 744–7
 additional mean costs per patient
 with/without nutrition
 support **750**
 application difficulties 744–7
 assessment, costs/outcome 746
 cost–benefit 744
 cost–effectiveness 744, 748
 cost–identification
 (assessment/comparison or
 minimisation) 744, **748**
 cost–utility analysis 744, **745**,
 748
 decision analysis 744, **748**
 economic analysis,
 appropriateness of clinical
 study 746–7
 malnutrition 739, **740**
 marginal analysis 744
 prevalence of disease-related
 malnutrition 735, **735–7**
 sensitivity analysis 744
 terminology 744
 length of stay **748, 749**
 support team roles 251
 CPN *see* parenteral nutrition, central
 venous route
 critical illness *see* intensive care
 Crohn's disease 555–66
 fish oil preparations 420
 HPN 488
 indications for paediatric EN 351
 nutritional management 564
 PEG placement 290
 vitamin K deficiency 493
 CTJ *see* jejunostomy, cuffed-tube
 cyclic adenosine monophosphate
 (cAMP), LMF continuous
 stimulation 650
 cyclophosphamide, vincristine and
 actinomycin D 653
 cyproheptadine hydrochloride, cancer
 therapy 665–6
 cysteine 407–8
 acetylcysteine, renal clearance
 417–18
 cysteine peptide
 synthesis 408
 taurine and glutathione
 formation 417
 cysteinyl-leukotriene (Cys-LT)
 metabolism, glutamine
 dipeptide influence 412
 cystic fibrosis
 dietary LCT and MCT 127
 enteral diet 311
 indications for paediatric EN
 352–3
 PEG placement 290
 cystinuria, arginine uptake 114
 cytokines 93–104
 and amino acids 101–2
 anorexia 102
 anticytokines, cancer therapy 667
 beneficial effects upon host 95
 cancer cachexia mediation 647–8
 chronic diseases 96
 glucose metabolism 649
 HIV replication **101**
 in hyperalimentation 103
 modulatory influences
 amount/route of nutrient
 delivery 102–3
 effects on metabolism 97–8
 fats 98–100
 oxidants, and antioxidant status
 100–1
 pathological effects 95–6
 protein/amino acids intake
 101–2
 and polyunsaturated fatty acids
 (PUFA) 98–9
 pro-inflammatory
 actions upon immune system
 and metabolism **95**

Cambridge University Press

978-1-107-60965-5 - Artificial Nutrition Support in Clinical Practice: Second Edition

Edited by Jason Payne-James, George K. Grimble and David B. A. Silk

Index

[More information](#)

INDEX

- cytokines – *continued*
 pro-inflammatory – *continued*
 anorexia 102–3
 control by innate systems **96**
 endogenous modulators 97–8
 glutamine effects 412
 and HIV replication **101**
 pathological effects in diseases
 and conditions **96**
 protein metabolism 101–2, 647–8
 protein turnover effects 48
 and tissue wasting 155
 and unsaturated fatty acids,
 infection/trauma/inflam-
 matory disease **99**
 and viruses 96
- daunomycin
 malabsorption 653
 oesophageal stenosis 653
- deglutition disorders 159–60, 351
 diet regurgitation and aspiration
 risks 286
 gastric atony 309
- dehydration
 elderly people 689–90
 hyperosmolar 451
- dementia, PEG contraindication 290
- Denmark, hospital food, two
 recommended diets **269**,
270
- Depage–Janeway gastrostomy 291
- deuterium, doubly-labelled water
 method, measurement of
 MR **64**
- dextrins
 alpha-limit, hydrolysis 117–18
 maltodextrins
 EN 120
 predigested elemental diets 318
- diabetes mellitus
 with neuropathy
 diet regurgitation and aspiration
 risks 286
 FBT placement, prokinetic
 drugs 287
 gastric atony 309
- dialysis
 peritoneal, FPG 291
 PN in 532
- diarrhoea
 antidiarrhoeal drugs 338, 712
 chinidin 338
 EN-related 310, 337–8
 fibre supplements 315
 incidence rates 337
 non-infectious 124–5
 fibre and enteral nutrition 315
- fluid balance maintenance 338
- intermittent enteral feeding 295
- lactose-induced, nucleotide
 supplementation 126
- short bowel/syndrome 708–9
- stool culture 338
- stool output quantification 337
- symptomatic therapy 338
- water malabsorption 124–5
- diet technicians, ward staffing,
 hospital 262
- dietician, team role 245
- digestion, humans, small intestine/
 caecum digesters 110
- digoxin, diarrhoea association 338
- dilution techniques, body water
 compartment volume
 assessment 172
- DNA, cDNA, amino acid transporter
 114
- dog, prolonged starvation, percentage
 loss of organs **5**
- doubly-labelled water method,
 measurement of MR,
 isotope disappearance
 curves **64**
- Douglas bag 63–4
- drinks/liquid supplements, energy
 and protein content **271**
- dronabinol, cancer therapy 666
- drug abusers, intravenous, catheter-
 related sepsis risks 489
- drug interactions, EN 340
- drug therapy
 CNS, hepatic encephalopathy
 association 89
 diarrhoea related 338
 feeding tube administration, tube
 blockage 112
 jejunostomy 711–12
 PN formulation 440–1
- duodenostomy, PED 291–2
- dysgeusia, hypophagia association
 643
- dysomnia, food aversion 643
- dysphagia, elderly people 687–8
- eating
 disorders, enteral tube feeding
 159–60
 gastrocolonic response 310
 inadequate chewing 687
 oral incontinence 687–8
 see also oral diet
- economics *see* cost-effectiveness of
 treatment
- education and training, hospital food
 as treatment 262
- eicosanoids
 cyclooxygenase pathway 542
 (prostaglandin, leukotriene and
 thromboxane), synthesis in
 IBD **564**
- eicosapentaenoic acid (EPA),
 endotoxin stimulation 420
- elderly patients 681–99
 adiposity 688
 aversive feeding behaviours (AFB)
 691
 dehydration 689–90
 dementia 691
 diet regurgitation and aspiration
 risks 286
 dietary intakes 687–8
 social factors 688
 dietary modifications 692
 dysphagia 687–8
 energy requirements 684
 ethical dilemmas 693–4
 exercise 689, 692
 malnutrition
 management 691–3
 dietary modification 692
 enteral feeding 692–3
 environment 692
 sip-feeds 692
 Mini-Nutritional Assessment
 (MNA) 691
 nutritional needs 684–7
 carbohydrates and fibre 685
 energy 683–4
 fat 685
 minerals 686–7
 protein 684
 vitamins 685–6
 nutritional status, assessment
 690–1
 nutritional support, future
 developments 694
 oral supplements 274–5
 orthopaedic department 274
 physiological needs 687
 third age, classification 683
 undernutrition as inpatients
 actual consumption 257–9
 recommendations 263–4, 277
 water requirements 689–90
- electrolytes
 absorption 123–4
 concentrates, diarrhoea association
 338
 disturbances, EN 340
 lipid emulsion stability 438–9
 Davis equation 439
- elemental diets, predigested 305–7,
 311, 317–19

- emphysema
 enteral diets 319–20
 and MR 73
 subcutaneous, PEG complication 290
- EN *see* enteral nutrition
- encephalopathy
 hepatic *see* liver disease
 Wernicke's
 alcoholic cirrhosis 87
 thiamine deficiency 156, 686
- endoluminal brush, catheter-related sepsis 387
- endoplasmic reticulum, lipid re-esterification 123
- endoscopy
 duodenostomy/jejunostomy, EN 292
 FBT placement 287
 gastrostomy 288–91
 endothelial damage, PVT 390–1
 endotracheal tube, cuffed, FBT risks 285
- energy expenditure 179–83
 direct and indirect calorimetry 181
 estimation 518–19
 measurements 180–1
see also metabolism/metabolic rate;
 resting energy expenditure (REE); total available energy (TEE)
- energy requirements 259–61, 307–8
 calorimetry measurement 308
 cancer cachexia 643–5, 665
 biochemical aberrations 645
 NEFA oxidation 645
 resting (REE) 643–4
 chronic fasting, oxygen consumption decrease 644–5
 Cori cycle association 645
 elderly patients 683–4
 Harris & Benedict equation 179, 260, 308
 macronutrients 177–91
 paediatric 216–17, 469
 recommendations 308
 in respiratory failure 544–5
 resting (REE), hormone-sensitive lipase 650
- enteral nutrition 303–32
 audit, Oldchurch nutrition team **249**
 cancer patients, nutrition status 655
 carbohydrate absorption 120
 carbohydrate source 117
 clinical factors 305, 307–8
 gastrointestinal function 308–9
 inflammatory bowel disease 561–6
 pancreatitis 727–9
 surgical patients 610
 complications 333–46
 aspiration of food 338–9, 373–4, 547
 contamination and infectious complications 293–4
 drug interactions 340
 infective 340
 management and prevention 341–2
 metabolic 339–40
 monitoring guidelines (BAPEN) 340–1
 disease-specific 307, 319–21
 elderly patients 692–3
 PEG vs NGT 693
 EN vs parenteral 759–73
 morbidity and mortality 767–9
 non-outcome studies 763–4
 fibre, and bowel function effects 314–17
 formulations 306, 311–14
 maltodextrins 120
 modular 307
 specialised 307, 321–2
 sucrose 120–2
 paediatric requirements 213–24, **349**
 patient assessment 283, 305
 strategy development 311–12
 supplementary enteral tube feeding, cost-effectiveness 741
 variable effects 657
see also enteral tube feeding; home enteral tube feeding;
 nasoenteral tubes; paediatric enteral nutrition
- enteral tube feeding
 administration techniques
 closed system 294
 commercial feeds 294–5
 contamination and infectious complications 293–4
 continuous vs bolus 295
 HACCP 295
 starter regimens 295
 commencement 295–6
 complications 335–7
 continuous, diarrhoea association 124
 historical considerations 283
 hospitalised patients 158, 159–60
 long-term 288–93
 minimal, post-abdominal surgery 159
- monitoring 296
 patient consent 283
 short-term 284–8
see also enteral nutrition;
 nasoenteral tubes
- Enterococcus*, tunnelled catheter infections 386
- enterocyte brush border
 carbohydrate absorption 118
 disaccharidases, decrease, TPN 761
 enterokinase binding 111
 fatty acid translocation 122–3
 enterokinase, expression 111
- enzymes, protein absorption 110–12
- epithelial cells *see* gastrointestinal epithelium
- ethane production, free radicals 100
- ethanol, oxygen consumption and **RQ 68**
- eukaryotic initiation factors (eIFs), protein turnover 43
- European countries, home enteral tube feeding, national register **376**
- extracellular water volume (ECW), assessment 171
- facial injuries, FBT risks 285
- fasciitis, necrotising, PEG complications 290
- fasting *see* starvation, short term
- fat, body *see* body fat
- fat free mass (FFM), and MR 65
- fats, dietary *see* lipids
- fatty acids
 alcohol misuse 86
 blood glucose and ketone bodies, prolonged starvation **13**
 enterocyte membrane translocation 122–3
 essential, deficiency (EFAD), PN 449
 free fatty acids (FFA), hepatic synthesis 84
 immune modulators 529
 monounsaturated (MUFA), Mediterranean diet 419
 non-esterified (NEFA) 13
 and disease **187**
 oxidation, energy expenditure 645
 polyunsaturated (PUFA)
 in infection, and cytokines **99**
 long chain (LCP), premature infants 221
 n-3 403, 420–2
 cyclo-oxygenase pathway inhibition 420

Cambridge University Press

978-1-107-60965-5 - Artificial Nutrition Support in Clinical Practice: Second Edition

Edited by Jason Payne-James, George K. Grimble and David B. A. Silk

Index

[More information](#)

INDEX

- fatty acids – *continued*
polyunsaturated (PUFA) – *continued*
n-3 – *continued*
IBD 565
immunoregulatory process
effects 420
and n-6 98, **99**, 140, 313
surgical patients 597, 611
omega-3: omega-6 ratio 158–9
omega-3, fish oil emulsion 420–1
omega-3 immune response
modulation 322
oxidative damage 197–8
paediatric requirements 221
prostaglandin metabolism 545–6
response to cytokines 98–9
synthesis **563**
short-chain (SCFA)
colonic epithelium trophic
effects 315–16
in IBD 565–6
luminal microflora 112
postoperative effects,
experimental 316–17
water and electrolyte absorption
124
triglyceride–fatty acid metabolism
activity and energy cost, burn
injury **16**
critical illness 74
see also triglycerides
FBT *see* nasoenteral tubes, fine-bore
feeding care assistants, ward staffing
262
femur fractures 692
fetal and neonatal malnutrition,
effects on adult health 220
fever, and cytokines 103
fibre and enteral nutrition 314–17
bowel function effects 314–15
constipation 314
diarrhoea 315
elderly requirements 685, 692
epithelial cell proliferation
experimental studies 315–16
SCFA postoperative effects 316
fibre concentration 317
fibre source 317
gut barrier function 317
predigested elemental diets 319
fibre supplements
particle size 314–15, 317
sources 315
fibrinogen, acute phase proteins 19
fish oil
anti-inflammatory effects 420–1
circulating TNF-alpha reduction
421
fatty acid oxidation 421
preparations 420
see also fatty acids, polyunsaturated
fluid requirements
burn injury 577–80
composition of fluid loss 469
Parkland formula 579
fluid retention, excessive glucose in
PN 452
fluoride, RDA/effects 206–7
fluoroscopically guided percutaneous
gastrostomy (FPG) 291
fluoroscopy, FBT placement 287
5-fluorouracil
malabsorption 653
mucositis 652
radiotherapy combination 653
folic acid
antagonists, malabsorption 653
deficiency
HIV infection 631
malignancy 685–6
megaloblastic anaemia 156
IBD 558, 559
and immune function 141
RDA/effects 202–3
food *see* hospital food; oral diet;
specific nutrients
food supplements *see* oral
supplements
free radicals
antioxidants, in cytokines 100–1
ethane and pentane production 100
ROS 197
scavenging mechanisms 198
Fresenius Kabi nutrition programme,
paediatric PN **470**
fructose 423
uptake mediation, GLUT5
transporter 319
galanin, appetite control 234
gall bladder dysfunction, HPN related
491–2
gas chromatography–mass
spectrometry (GC–MS),
plasma and precursor pool
labelling 35
gas exchange
energy expenditure by direct and
indirect calorimetry 181
measurement of MR 63–4
gastric atony
patient groups and associated
diseases 309
stasis, jejunal feeding 155
gastric cancer, labelling index, TPN
effects 662
gastric emptying, postoperative delay
272
gastritis, atrophic, elderly patients
685–6
gastrocolonic response, eating 310
gastrointestinal bleeding
EN contraindication 339
hepatic encephalopathy 89
gastrointestinal epithelium
bacterial translocation 762–5
animal studies 765
human studies 765–7
permeability 123–4
proliferation with fibre
supplements 315–17
gastrointestinal function
barrier function 317
iatrogenic lesions, nutrition
changes 649
motility 309–11
diet regurgitation and aspiration
risks 286
enteral diets 308–11, 337–9
fasting state 309
PN 155
see also motility disorders
nutrient deficiencies 155
preoperative PN 156–7
protein turnover effects 46
radiotherapy tolerance 651–2
gastrointestinal secretions, volumes
704
gastrointestinal surgery, enteral
feeding contraindication
296
gastrojejunal tubes, advantages/
disadvantages 357
gastrostomy
button devices 293, 358
EN 288–92
endoscopic 288–91
laparoscopic 291–2
PEG and FPG 288–91
temporary, child 356–7
gastrostomy tubes
HETF 371
specifications **358**
GLP-2 714
glucagon
carbohydrate homeostasis 84
injury and sepsis 71–2
protein turnover effects 47
glucocorticoids
and cytokines 97, 98
nitrogen metabolism 649
gluconeogenesis
alcohol inhibitory effect 86
amino acids 83–4

- cancer 645
inhibition, cancer therapy 667
post injury 17–18
starvation 70
- glucose 422–3
disposal, oxidation and storage, and insulin **185**
EN monitoring 296
hepatic 83
homeostasis abnormalities 86
lipid emulsion stability 438
metabolic stress 423
metabolism
cytokine administration 649
TNF-alpha 649
oxidation
during infusion **186**
injured/burned subjects **16**, 72
oxygen consumption and RQ **68**
sepsis, low and high REE, with i.v. glucose **74**
requirements in disease/health 185–6, 422
starch hydrolysis 118
tolerance, and dietary fibre 685
TPN regimens
cancer therapy 667–8
excessive administration 450–2
see also monosaccharides
glucose–alanine shuttle 83
glucose–‘lactate’
activity and energy cost, burn injury **16**
fructose-6P–fructose-1-6P **16**
glucose–glucose-6P **16**
glutamate, cysteine uptake inhibition 407
glutamine 18, 598–9
acetylglutamine, renal clearance 417–18
cancer therapy 668–9
concentrations in muscle **595**
cysteine administration 408–9
functions 322
glutamine dipeptides
animal studies 409–10
arginine interaction 410
glutathione preservation 410
heat shock protein 70 expression and RNA transcription 410
human studies
clinical studies 411–16
healthy volunteers 410–11
immunostimulatory role 413
intra/extracellular glutamine pools 410, 412, 416
mechanism of action 416
muscle protein balance 409
nitrogen retention 411
patient group benefits 416
TPN effects 414–15
injury and sepsis 516–17
intestinal metabolism 126–7
lymphocytes and macrophages 139
nitrogen loss amelioration 46
PN solutions 159
predigested elemental diets 318
properties 610–11
supplementation 322
survival improvement 413
TPN 517, 519, 610–11
transporter system 38–9
glutathione 101–2
glutamine preservation 410, 416
glyceryl trinitrate patches, PVT risk reduction 392, 395
¹⁵N-glycine ammonia, protein turnover measurement 32
glycogen
metabolism, amino acid regulatory role 39
pool, starvation 9–10
storage and synthesis costs 69, 70–1
synthesis, fructose 423
glycogenolysis 83–4
insulin suppression 86
glycolysis, anaerobic, cancer tissue 646
gold, excess 141
Golgi apparatus, triglyceride transfer 123
Groshong catheter, HPN 383–4
growth, glutamine enhancement 414
growth factors, hepatic 90
growth hormone 599
administration
mortality risk 47–8
nitrogen loss amelioration 48
cancer therapy 666–7
liver 90
plasma, insulin resistance 86
protein turnover effects 47–8
secretion, insulin stimulation 125
guanethidine, diarrhoea association 338
HACCP *see* Hazard Analysis Critical Control Point
haemodialysis, PN 532
haemorrhage, feeding tube insertion 337
hand grip strength 170–1, **170**
Harris & Benedict equations
energy requirements 308
REE 179
RMR 260
Havering Hospitals Trust, Oldchurch nutrition team 247–50
Hazard Analysis Critical Control Point (HACCP), EN administration 295
head injury, EN vs PN 767–8
health economics *see* cost–effectiveness of treatment
heart *see* cardiac
heat shock protein (HSP) 70, induction, glutamine 410
height
children, malnutrition recognition 151–2
velocity, and height attained, boys and girls **215**
heparin
catheter occlusion risk reduction 388
cyclical CPN, catheter care 396
lipase and enterocytic brush border binding 122
PN formulations 441
PVT risk reduction 392
hepatic *see* liver
hepatobiliary dysfunction, HPN, associated factors 491
hepatocellular carcinoma, protein turnover rate increase 646
hepatocytes, replication 89
Hickman catheter, HPN 383
histidine, protein nutrition substrate 405
HIV infection and AIDS 617–38
background and history 619–20
in developing countries 620
drugs 627, 629
anabolic drugs 629
antiretroviral treatment (HAART) 619–20
appetite stimulants 629
pancreatic enzymes 629
future perspectives 633
mother-to-child transmission 626
nutrition support 624–6
asymptomatic HIV infection 626–7
dietary supplementation 627–8
EN and PN 628–9
energy and macronutrients 624–5
food hygiene 627
guidelines 626
micronutrients 625–6, 629
side-effect management 627
specialised diets 628

Cambridge University Press

978-1-107-60965-5 - Artificial Nutrition Support in Clinical Practice: Second Edition

Edited by Jason Payne-James, George K. Grimble and David B. A. Silk

Index

[More information](#)

INDEX

- HIV infection and AIDS – *continued*
 nutrition support – *continued*
 vitamin A status and risk of
 mother-to-child
 transmission **626**
 paediatric HIV infection 629–33
 assessment and management of
 weight loss **630**
 breast feeding 633
 gastrointestinal investigation and
 management of diet **631**
 nutrition support scheme **632**
 pathophysiology of weight loss
 620–4
 body composition and protein
 synthesis 624
 body weight stability 228
 energy balance 622–3
 fat metabolism 623–4
 gastrointestinal infections 621–2
 HAART and energy metabolism
 623
 jejunal biopsy, villous atrophy
 and crypt hyperplasia **621**
 lipid abnormalities 620
 REE, TEE and energy intake
 73, **622**, **623**
 sulphhydryl compounds 408
 HIV replication
 cytokines, modulation of
 inflammatory response **101**
 nuclear factor (NF) kappa-beta 96
 home enteral tube feeding 367–78
 age of patients 370, **370**
 benefits to patients 371
 complications 360
 ethical considerations 376
 European countries 376
 feeding routes 371–2
 feeds and administration methods
 372–3
 portable EN pump **372**
 portable feeding system (back
 pack) **373**
 follow-up and monitoring 375
 future care 376–7
 incidence and growth 369
 indications 369–70
 associated disorders **370**
 reasons for starting HETF **370**
 outcome and quality of life 375–6
 paediatric 357–61
 patient selection 370–1
 problems and complications 373–4
 aspiration of food 373–4
 feeding tubes 373
 funding issues 374
 nutrient deficiencies 374
 returning patient to community
 374–5
 home parenteral nutrition 485–98
 asepsis 489
 bone disorders 492–3
 catheter choice 383
 complications 489–93, 494
 catheter-related sepsis 489–90
 hepatobiliary 491–3
 of prescription 490
 controversial areas 493–5
 teams, specialist centres and
 small units 493–4
 cost-effectiveness 495
 epidemiology and indications
 487–8
 equipment
 all-in-one bags 490
 pumps 489
 historical aspects 487
 lipid energy supply 490
 mortality rates 494–5
 ‘paradox of rickets’ 492
 PINNT 489
 practical considerations 488–9
 prescribing 490
 prevalence 487
 quality of life issues 494–5
 route of administration 489
 taurine-enriched, intrahepatic
 cholestasis therapy 491
 hospital audit 247–50
 data assessment
 educational programme 248
 infection of feeding lines 248
 intake 248
 malnutrition 248
 total work load 248
 hospital food service 263
 results 248–50
 assessment, nutrient intake 249
 IV feeding by Oldchurch
 nutrition team **249**, **250**
 malnutrition, before/after
 education programme
 248–9
 monitoring of IV enteral and
 oral feeding 249–50
 hospital food 255–65, 269–70
 audit, food chain management/
 finance 263
 Denmark, recommended diets **269**,
270
 distribution and serving systems
 261–2
 central service trays/pates 261
 ward-based bulk service/
 kitchens 261
 food chain management and
 finance
 audit 263
 control **263**, **264**
 production 261
 food composition
 energy density 270
 satiety and intake 270
 history of provision 243
 low food consumption and high
 wastage 258–9
 catering/management 258,
 259
 environment 259
 medication 259
 menus, quality and quantity
 258–9, 262
 missed meals 258
 staffing and serving 259
 timing 259, 263
 nature of food, relevance to energy
 intake **270**
 patient requirements 259–61
 recommendations 263–4
 studies of healthy volunteers 270
 timing of meals/snacks/beverages
 259, 263
 undernutrition in inpatients
 149–64
 immune dysfunction 142
 recommendations 277
 ward staffing
 diet technicians 262
 education and training 262
 feeding care assistants 262
 volunteers, help with feeding
 262
 ward hostesses 262
 hospital nutrition team 247
 support and liaison 248
 hospitalised patients
 enteral tube feeding 159–60
 malnutrition 149–64
 screening 153
 nutrition support benefits/
 management 156–60
 oral supplements 159
see also hospital food; surgical
 patients
 hub fracture, catheter-related sepsis
 490
 hydration, in respiratory failure
 547
 hydrazine sulphate, cancer therapy
 667
 hydrocortisone
 instability, PN formulations 441
 PVT risk reduction 392

- hydropathy plots, Kyte–Doolittle, transport protein identification 114–15
- beta-hydroxy-methylglutaryl CoA (HMG–CoA), hepatic synthesis 84
- beta-hydroxybutyrate and acetoacetate (AcAc) **11–13**
- hepatic synthesis 83
- starvation 10–13
- hydroxyurea malabsorption 653
- radiotherapy combination 653
- hyperalimentation 74
- acute metabolic complications in PN 450–4
- algorithm, practical application, pancreatitis **728**
- and cytokines 103
- HPN related 491
- hyperammonaemia arginine 405
- arginine deficiency 125
- hypercalcaemia 140
- amino acids in PN 453–4
- hypercapnia, excessive glucose administration in PN 451
- hyperchloraemic acidosis 448
- hypercholesterolaemia, lipid emulsions in PN 453
- hyperglucagonaemia, insulin resistance 86
- hyperglycaemia burn injury 17
- defined 448
- diabetes of injury 20
- excessive glucose administration in PN 450–1
- incidence rates 341
- hyperinsulinaemia, cirrhosis 86
- hyperkalaemia incidence rates 341
- renal failure 530
- hyperlipidaemia cancer 646
- TPN 453
- hypernatraemia, incidence rates 341
- hyperosmolar dehydration 451
- hyperosmolar hyperglycaemic non-ketosis, defined 448, 451
- hyperphagia, intestinal adaptation 110
- hyperphosphataemia, renal failure 530
- hypertriglyceridaemia defined 448
- lipid emulsions in PN 453
- PN, metabolic complications 453
- hyperuricaemia, fructose administration rate 423
- hypoalbuminaemia assessment of nutrition 169–70
- cancer 647
- enteral feeding intolerance 338
- hepatic disease 88
- negative acute phase response 19–20
- hypocalcaemia PN 448–9
- renal failure 530
- hypoglycaemia cirrhosis 86
- defined 448
- incidence rates 341
- PN 447–8
- hypokalaemia 710
- incidence rates 341
- hypomagnesaemia 140, 493, 648
- incidence rates 341
- jejunostomy 710
- renal failure 530
- hyponatraemia, incidence rates 341
- hypophagia, cancer cachexia 642–3, 651–3
- hypophosphataemia incidence rates 341
- PN 448
- renal failure 530
- respiratory failure 544
- hypothalamus, control of food intake and energy balance **227**, 232–3
- hypothermia, malnutrition association 156
- hypothyroidism diet regurgitation and aspiration risks 286
- gastric atony 309
- hypozaemia, incidence rates 341
- iatrogenic malnutrition hypophagia 651–3
- malabsorption 653
- IgM anti-endotoxin response, pancreatitis 724
- ileal absorption, short bowel 705, **705**
- imidazole carboxamide, side effects 652
- immobility, tissue wasting 155
- immune function 137–48
- amino acids 139–41
- calcium deficiency 140
- clinical practice 142–8
- cancer patients 142–3
- immunosenescence 142
- inflammatory bowel disease 143
- nutritional supplements 142
- protein–energy malnutrition 139, **139**
- specific vitamin deficiency effects 141
- TPN 143, 656–7
- undernutrition 142
- fish oil effects 420–1
- glutamine requirement 42
- immune-enhancing diets 322
- immunosenescence 142
- iron and zinc 140
- lipids 140
- malnutrition 155–6
- nucleotides 139
- trace elements 139–41
- vitamins, water and fat-soluble 141
- see also* cytokines
- immunomodulation acute burns 586–8
- arginine 405–6
- fish oil emulsion 421
- taurine 407
- infant formulae 354
- amino acid-based 356
- infants energy requirements 349
- neonatal malnutrition, effects on adult health 220
- neonates, PN formulation 441
- preterm, glutamine TPN 414
- very low birth-weight (VLBW), glutamine TPN 414
- see also* paediatric enteral nutrition
- infections bacterial translocation 765–7
- complications, EN 340
- respiratory 689–90
- see also* injury and sepsis
- inflammatory bowel disease 553–73
- administration technique and monitoring 564–5
- background 555
- Crohn's disease 564
- eicosanoid (prostaglandin, leukotriene and thromboxane) synthesis **564**
- EN 561–6
- future trends 565–6
- glutamine 566
- management 563–5
- micronutrients 566
- n-3 fatty acids (marine oils) 565
- short chain fatty acids (SCFA) 565–6
- structured lipids 566
- EN vs PN 769
- immune dysfunction 143

Cambridge University Press

978-1-107-60965-5 - Artificial Nutrition Support in Clinical Practice: Second Edition

Edited by Jason Payne-James, George K. Grimble and David B. A. Silk

Index

[More information](#)

INDEX

- inflammatory bowel disease – *continued*
 micronutrient deficiency 558–60
 minerals and trace elements 559–60
 vitamins 558–9
 nutrition status 555–8
 protein–energy malnutrition (PEM) 555–8
 malabsorption 557–8
 nutrient intake 556
 PUFA synthesis **563**
 TPN 560–1
 ulcerative colitis 563–4
 weight loss 228
- inflammatory diseases, sulphydryl compounds 408
- inflammatory response 95, 99–101
see also cytokines
- inherited metabolic disease, indications for paediatric EN 351
- injury and sepsis 13–24, 71–3, 511–22
 abdominal, enteral feeding contraindication 296
 EN vs PN 767
 hepatic encephalopathy 89
 history 513
 intra-abdominal, gastric atony 309
 intracellular amino acids 30
 metabolic response 13–24, 71–3
 acute phase proteins 18–20
 amino acids 17–18
 basal hypermetabolism in REE **14**, 72–3
 change in REE after elective surgery/injury **14–15**, 72
 clinical implications 20–1
 cytokines 101–2
 ‘ebb’ and ‘flow’ phases 71–2
 energy metabolism 14–15, 72, 517–18, **518**
 glucose–‘lactate’, activity and energy cost, burned subjects **16**
 hyperalimentation 74
 nitrogen metabolism 15–17, 517–18, **518**
 triglyceride–fatty acid metabolism **16**
 variability in response 20
 see also metabolism/metabolic rate
 post-operative, bacterial translocation association 766
 practical applications 515
- recommendations for clinical practice 518–19
 energy requirements 518–19
 future perspectives 520
 protein requirements 519
 substrate utilisation 515–17
 theoretical problems and benefits of support 513–14
- insulin
 amino acid stimulation 85
 cancer therapy 666
 carbohydrate homeostasis 83–4
 insulin resistance, liver disease 86
 and MR 68
 protein turnover modification 46–7
 proteolysis effect 47
- insulin-like growth factor (IGF-1), protein turnover effects 47–8
- intensive care 591–603
 body composition changes **594**
 carnitine deficiency 597
 EN vs PN 768–9
 future trends 598–9
 glutamine concentrations in muscle **595**
 history 593–4
 practical applications
 energy supply 596–7
 nitrogen supply 597–8
 practical guide for nutrition 599–600
 protein synthesis rate **595**
- interferon-gamma, fat metabolism effects 649
- interleukins 95–104
 IL-1 97–104
 cancer cachexia 649
 IL-6 97–104
 elevation in cancer 649
 nitrogen metabolism 649
 inhibitors 97–8
 see also cytokines
- intestinal barrier *see* gastrointestinal epithelium
- intestinal metabolism 107–35
 amino acid metabolism 42
 intestinal morphology 761–2
 intestinal obstruction
 feeding tube leakage 336
 PEG complication 290
 intestinal physiology 761
 intestinal size *see* short bowel
 intramural gas, imaging investigation 339
- iodine
 excess 141
- RDA/effects 206–7
- iron
 acute phase response **206**
 age and RDA 219
 deficiency 559
 paediatric 220–1
 and immune function 140
 RDA/effects 206–7
- irradiation, taurine excretion 407
- isotopes
 dilution techniques, body water volume assessment 172
 doubly-labelled water method, measurement of MR **64**
 extracellular water volume (ECW), assessment 171
 protein metabolism tracers 29–30
 radioactive and stable-isotope tracers, legal and ethical considerations 30
 turnover measurements, protein metabolism 31–7
- jaundice, and steatorrhoea *see* liver disease
- jejunal absorption, short bowel 705, **705**
- jejunal biopsy, partial villous atrophy and crypt hyperplasia, weight loss in HIV infection **621**
- jejunal feeding
 gastric stasis 155
- jejunal tubes
 advantages/disadvantages 357
 specifications **358**
- jejunostomy 709–13
 button devices 293
 child 356–7
 cuffed-tube (CTJ) 293
 EN 292–3
 endoscopic 292, 293, 292
 see also percutaneous endoscopic jejunostomy
 jejunostomy tubes, HETF 371
 magnesium and potassium deficiency 710
 needle catheter (NCJ) 292–3
 feeding tube displacement 336–7
 patient selection 292
 standard-size jejunostomy conversion 292–3
 nutrient absorption, PN 712–13
 PEJ 291–2
 presentation 709
 subcutaneous (SCJ) 293
 surgical (SJ) 292
 patient selection 292

- Witzel technique, complications 292
treatment 710–12
 antidiarrhoeal drugs 712
 antisecretory drugs 711–12
 magnesium supplements 712
 oral glucose-saline solution 711
 oral omeprazole **712**
 restrict oral fluids 710–11
 water and mineral losses 709–10
jugular veins, cannulation 385
- ketogenesis
 3-hydroxybutyrate (beta-OHB) and acetoacetate (AcAc) **11–13**
 circulating concentration 10, **11**
 metabolism in obese subjects 10
 molar ratio **11**
 release in short-term starvation **12, 71**
 amino acids 84
 starvation 10–13
 storage costs 69
¹³C-alpha-ketoisocaproate labelling, protein turnover measurement 44–5
Kleiber's law 109–10
Krebs' tricarboxylic acid cycle
 amino acid metabolism 41
 CoA 84
Kyte–Doolittle hydrophathy plots 114–15
- lactation, protein intake
 recommendations 42, 220
lactic acid, cancer 645
lactic acidosis, fructose administration rate 423
lactose intolerance 271, 337
lactulose, hepatic encephalopathy
 treatment 89, 112
lead, excess 141
lecithin–cholesterol acyltransferase (LCAT), hepatitis 86
leptin 230–2
 human/murine *ob* gene 229–32
 long-term regulation of appetite and body weight 229–32
 mutations in receptor 231
 relation between body fat and serum leptin **232**
 site of action 230–1
leucine tracer
 protein turnover measurement 32, 34–5
 fractional synthetic rate calculation 34
- leukotrienes
 synthesis, EPA effects 421
 and thromboxane, inflammatory bowel disease **564**
line fracture, catheter-related sepsis 490
lipase, hormone-sensitive, REE stabilisation 650
lipid emulsions
 anabolic response 158
 ICU 597
 and lung 473
 MCT, proinflammatory cytokine reduction 158
 phospholipids, IV 437
 PN 452–3, 472–3
 hypercholesterolaemia 453
 hypertriglyceridaemia 453
 lipoprotein X (LPX) 453
 stability 437–8
 affecting factors 438–9
 assessment 439
 mechanisms 438
 Van der Waal's forces 437–8
lipid mediators, glutamine influence 412
lipid mobilising factor (LMF), catabolic factors, cancer cachexia 650
lipid nutrition substrates 418
 new preparations 418–22
 physiologic functions 418
lipids 69, 98–9, 140, 217, 472
 absorption 122–3
 emulsification 122
 assimilation 126–7
 cholesterol 99
 classification 98
 digestion and absorption
 disturbances, enteral feeding 337–8
 elderly requirements 685
 fish oil preparations 420–1
 healthy subjects 186
 hepatic metabolism 84, 86–7
 home PN 490
 and immune function 140
 influence of disease on non-esterified fatty acid (NEFA) **187**
 lipogenesis and RQ 74
 metabolism
 amino acid regulatory role 39
 cancer cachexia 646
 cytokine mediation 647–8
 oxidation/turnover
 oxygen consumption and RQ **68**
- sepsis, low and high REE, with i.v. glucose **74**
paediatric requirements 217
peroxidation, PN formulations 442
predigested elemental diets 319
requirements in disease 187
in respiratory failure 545–6
sources, paediatric PN 472
structured 403, 422
 rapid plasma clearance 422
 total kJ in storage 69
 see also fatty acids; triglycerides
lipolysis stimulation, TNF-alpha 649
lipoprotein lipase 472
lipoproteins
 lipase inhibition, alcohol misuse 87
 lipoprotein X 87, 453
 cholestasis 87
lipostat theory, appetite control 230
liquid supplements, energy and protein content **271**
lithocholic acid 477
liver disease 499–510
 acute liver failure 320–1, 507
 ascites 506
 assessment of nutrition status 504–6
 carbohydrate metabolism 86
 cirrhosis
 fat-soluble vitamin deficiencies 86
 feeding tube insertion
 haemorrhage 337
 hyperinsulinaemia 86
 hypoglycaemia 86
 pancreas beta-cell response 86
 RQ 504
 specialised enteral diet 311
cysteine administration 407
encephalopathy 506
 and coma 320
 complications 506
 enteral diets, branched chain amino acids 89, 320–1
 lactulose therapy 112
energy expenditure, substrate utilization 503–4
enteral diet 307, 311, 321
fulminant hepatic failure (FHF) 320–1, 507
future perspectives 508
glucose homeostasis abnormalities 86
hepatic failure, intracellular amino acids 30
hepatitis, LCAT reduction 86
hepatocellular carcinoma, protein turnover rate increase 646
history 501

INDEX

- liver disease – *continued*
 HPN related 491
 inappropriate nutrients in PN 454
 jaundice and steatorrhoea 506–7
 lipid metabolism 86–7
 liver transplantation 507–8
 malnutrition 86, **503**, 506–7
 osteomalacia 87
 steatohepatitis, HPN related 491
 steatorrhoea, jaundice 506–7
 steatosis, excessive glucose
 administration in PN 451–2
 theoretical problems and benefits
 of support 502–3
 tyrosine 408
 tyrosine dipeptide TPN 417
 visceral proteins 505
 vitamin deficiencies 87
- liver function
 amino acid metabolism 42, 88–9
 energy metabolism 83
 hepatic growth factors 90
 lipid metabolism 84, 86–7
 metabolic disturbances 86–9
 metabolism/metabolic rate 73,
 81–91
 and PN 477
 protein metabolism 88–9
 protein turnover effects 46
 regeneration, nutrition 89–90
 replication of hepatocytes 89
- liver transplantation 507–8
 pre-transplant patient assessment 86
- loperamide 709, 712
 diarrhoea therapy 338
- lungs
 immune system, effects of
 malnutrition and refeeding
 542–3
 parenchyma 541–4
 altered microcirculation and
 interstitial water 543
 effects of malnutrition and
 refeeding 541–4
 see also respiratory disease/failure
- lymphangiectasia, enteral diet 311
- lymphatic system, lipid release 123
- lymphocytes
 cysteine enhancement 407–8
 and macrophages, glutamine 139
 proliferation, glutamine effects 413
- lysine, deprivation by arginine 406
- macrocytic megaloblastic anaemia,
 vitamin B12 deficiency 156
- alpha-2-macroglobulin 101–2
- macronutrient requirements 177–91
 definition 179
- see also* named nutrients
- macrophages
 cysteine transportation 407
 glutamine 139
 and smoking 100–1
- magnesium
 age and RDA 219
 deficiency 140
 calcium absorption inhibition
 493
 jejunostomy 710
 osteoporosis 687
 supplements, jejunostomy 712
- malabsorption
 cancer 651, 653
 causes 310
 classification 310, 311
- malnutrition
 cost-effectiveness of treatment
 735–51
 cytokines 103
 delayed wound healing 350
 digestive tract secondary changes
 643
 disease-related
 cancer 642, 653–4
 causes **738**
 costs associated **740**
 liver disease 86, 502–3
 prevalence **736–7**
- elderly patients
 effects and consequences 688–9
 free-living and hospitalised 689
 management 691–3
- hospitalised patients 149–64
 clinical consequences 155–6
 immune system 155–6
 incidence 153–4
 metabolic problems 158
 pathogenesis 154–5
 prevalence 153–4
 recognition 151–3
 refeeding syndrome 158
 thermoregulation 156
- iatrogenic 651–3
- increased susceptibility to infection
 350
- malabsorption, cancer 651
- paediatric
 altered mood and depression
 350
 brain growth and
 neurodevelopment 349–50
 fetal/neonatal, and adult health
 220
 gastrointestinal function 350
 growth and delayed puberty 350
 long term health 350
- peptide-based diets 116
- protein–energy malnutrition
 albumin and 222
 IBD 555–8, **560**
 immune function 139
 increased intestinal protein losses
 557
 increased metabolism 556–7
 pathological factors **557**
 short bowel 706
 refeeding, and respiratory system
 540–4
 skeletal protein loss 142–3
 specific nutrient deficiencies 350
see also starvation
- maltases, classification 118
- maltodextrins, predigested elemental
 diets 318
- maltotriose, carbohydrate end-
 product 117
- manganese
 age and RDA 219
 in bile 474
 RDA/effects 204–5
- mass isotope analysis, protein
 turnover 36
- Mediterranean diet 419
- medroxyprogesterone acetate, cancer
 therapy 665
- megaloblastic anaemia
 alcohol misuse 87
 folate deficiency 156
 vitamin B12 deficiency 156
- megestrol acetate, cancer therapy 665
- melanin-concentrating hormone,
 appetite control 234
- melanocyte-stimulating hormone,
 appetite control 235
- melatonin, cancer therapy 667
- mercury, excess 141
- metabolic competition theory, cancer
 cachexia 642
- metabolic inhibitors, cancer therapy
 667
- metabolic manipulation, cancer
 therapy 669
- metabolism/metabolic rate 61–79,
 179–83
 adipose tissue, brown/white **66**
 and BMI, predictive equations **66**
 clinical aspects 69–71
 chronic diseases 73
 fasting/starvation 69–71
see also starvation
 in injury and sepsis 14–15, 71–3,
 517–18, **518**
 cytokines and amino acids 101–2
 energy expenditure, MEE 580–1

- energy requirements, in respiratory failure 544–5
- estimates **180**
- exogenous nutrient utilization 74–5
- and FFM 65
- hormonal control 67–8
- major metabolic processes 68–9
- measurement 180–1
- bicarbonate–urea method 65, **65**
- direct and indirect calorimetry 181
- doubly-labelled water method **64**, 180
- isotope disappearance curves **64**
- paediatric energy requirements 216
- respiratory gas exchange 63–4
- standardizations of MR measurements and values 65–6
- micronutrients 207–8
- oxidation 68–9
- energy yields, oxygen consumption and RQ **68**
- PN complications 445–59
- REE, *see also* resting energy expenditure (REE)
- surface area 65
- and synthesis 69
- TEE, *see also* total available energy (TEE)
- tissues and organs 66–7, **66**
- see also* basal metabolic rate; injury and sepsis; starvation
- metallothionein, and cytokines 97
- methionine 477
- methotrexate
- malabsorption 653
- mucositis 652
- methyldopa, diarrhoea association 338
- 3-methylhistidine, protein turnover measurement 32–3, 43, 44–5
- metoclopramide, gastric emptying 287
- microbiologist, team role 246
- micronutrients and minerals *see named minerals*; trace elements; vitamins
- Mini-Nutritional Assessment (MNA), elderly patients 691
- molybdenum
- age and RDA 219
- deficiency 450
- RDA/effects 204–5
- monosaccharides
- carbohydrate hydrolysis 318
- liver utilisation 83
- transport 119–20
- GLUT2 and 5 119
- sodium–glucose linked transporter 1 (SGLT1) 119
- ‘solvent drag’ 120
- unfermented, diarrhoea
- potentiation 124
- monounsaturated fatty acids (MUFA), Mediterranean diet 419
- motility *see* gastrointestinal function
- motor neurone disease, enteral tube feeding 159
- mucosal atrophy, TPN 762
- mucosal injury, predictor, nosocomial pneumonia 766
- mucosal permeability 123–4
- mucositis, chemotherapy 652
- multi-organ failure, bacterial translocation 610
- myocardial infarction, fish oil emulsion 422
- myocardial ischaemia, parenteral arginine 406
- myopathy, selenium depletion 156
- ¹⁵N-glycine ammonia, protein turnover measurement 32
- NADH:NAD ratio, alcohol misuse 86–7
- nasoenteral tubes 281–302
- access routes 283–5
- administration techniques 293–6
- advantages/disadvantages 357
- blockage, dietary protein 112
- double-lumen (dual-function) 287–8
- feeding reservoirs and giving sets, hang time 294–5
- fine-bore (FBT) 284–6
- access, endotracheal tube 285
- complications 284–5, 287
- extubation, unplanned and non-elective 286
- infants 286
- PEG to PECJ conversion 291
- placement
- nasoduodenal or jejunal 286–7
- nasopharyngoscope 285
- techniques 287
- X-ray confirmation 285
- prokinetic drugs 287
- transnasal 285–6
- long-term
- ports 293
- tube composition 288
- nasogastric, elderly patients 693
- oral supplements 272–3
- percutaneous gastrostomy 160
- pump-controlled 337
- reflux and tube position 339
- secretagogue bypass 311
- simultaneous gastric aspiration 159
- tube blockage prevention 293
- see also* enteral tube feeding
- nasogastric tubes
- advantages/disadvantages 357
- postoperative 273
- specifications **358**
- nasojejunal tubes 357
- specifications **358**
- nasopharyngoscope, flexible, FBT placement 285
- NCJ *see* jejunostomy, needle catheter
- necrosis, feeding tubes 336
- necrotising enterocolitis, EN 339
- needle catheters *see* catheters
- neurocognitive disorders, vitamin deficiency relationship 685
- neurodevelopmental disorders, indications for EN 351–2
- neurologic deficit, and aspiration risks, EN 338
- neuromotor deglutition disorders
- diet regurgitation and aspiration risks 286
- gastric atony 309
- neuromuscular blocking agents, diet regurgitation and aspiration risks 286
- neuropeptide Y, food intake, appetite control 233–4
- neurosurgical patients
- diet regurgitation and aspiration risks 286
- gastric atony 309
- neurotransmitters
- increasing food intake 233–4
- reducing food intake 235–6
- see also* peptides
- niacin, RDA/effects 202–3
- nickel, excess 141
- nicotinic acid, age and RDA 218
- nitric oxide (NO), arginine substrate 406
- nitrogen, *see also* protein metabolism
- nitrogen assimilation
- comparative diets 117
- free amino acid transport 112–14
- intestinal 112–15
- peptide hydrolysis 116
- peptide transport 114–15
- protein, dietary and endogenous 112

INDEX

- nitrogen assimilation – *continued*
 urea utilisation 112
 nitrogen balance *see* protein
 metabolism, nitrogen
 balance
 nitrogen mustard, side effects 652
 nitrogen requirements
 predigested elemental diets 318
 recommendations 308
 sources, paediatric PN 469–72
 ‘nitrogen trap’, neoplastic cells 642
 non-Hodgkin’s lymphoma, labelling
 index 663
 non-steroidal anti-inflammatories,
 topical, PVT risk reduction
 392, 395
 noradrenaline
 appetite control 234
 excretion 452
 nuclear factor (NF) kappa-beta, HIV
 replication 96
 nuclear transcription factors 96
 nucleic acids, immune response
 modulation 322
 nucleotides
 and immune function 139
 intestine utilisation 125–6
 PRPP salvage 125
 supplementation 126
 nurse, team role 245
 nutrition, postoperative *see*
 postoperative nutrition
 nutritional assessment *see* assessment
 of nutrition
 nutritional support team (NST) *see*
 support team roles
- ob* protein and *ob* receptor in mice,
 appetite control 230
- obesity
 fat reduction 685
 human/murine *ob* gene 229–32
 ketone bodies, metabolism 10
 and prolonged starvation 4, **5**
 fuel availability/survival time **6**
 glucose and plasma FFA, ketone
 bodies **71**
 murine models **5**, **229**
 TEE, fat, carbohydrate and
 protein **6**
 octreotide 711
 ODC *see* ornithine decarboxylase
 oesophageal disease, indications for
 paediatric EN 351
 oesophageal obstruction, PEG
 complication 290
 oesophageal varices, feeding tube
 insertion haemorrhage 337
- oesophagostomy, cervical, longer-
 term EN 288
 oligosaccharidases, brush border 118
 olive oil, lipid emulsions 419
 omeprazole, jejunostomy 711, **712**
 oral diet 255–65, 267–80
 liquid vs solid food, and energy
 density, satiety and intake
 270
 records of food intake 276–7
 undernourished patients,
 recommendations 263–4,
 277
 see also hospital food; oral
 supplements
 oral supplements 270–6, 306, 307,
 313
 commercial drinks/liquid
 supplements, energy and
 protein content **271**
 cost-effectiveness studies **742**
 elderly/geriatric patients 274–5
 home made, recipe for quarg and
 cocoa quarg drink **271**
 hospitalised patients 159
 nasogastric tubes 272–3
 palatability studies 272
 post discharge from hospital 275
 post surgery 273–4
 preoperative feeding vs overnight
 fasting 274–5
 principles 272–6
 sip feeding, reduction in solid food
 consumption 276
 undernourished patients, studies
 276
 organ function, malnutrition 155
 ornithine decarboxylase (ODC),
 hepatic activation 90
 oropharyngeal disease, enteral tube
 feeding 159
 orthopaedic department, elderly
 patients, oral supplements
 274
 osteomalacia
 chronic hepatic disease 87
 vitamin D-induced, HPN related
 492
 osteoporosis 87, 492–3
 calcium intake 687
 overfeeding *see* hyperalimentation
 oxalate, absorption, short bowel 708
 oxidants, and antioxidant status,
 modulation of cytokines
 100–1
 oxygen consumption
 aerobic metabolism 68–9
 and RQ, energy yields **68**
- paediatric(s), *see also* – nutrition
 assessment; – nutrition
 requirements; – parenteral
 nutrition; paediatric enteral
 nutrition
 paediatric enteral nutrition 347–65
 choice of enteral feed 354–6
 complications of feeding 357
 elemental formula 356
 feeding routes 356–7, **357**
 home enteral tube feeding 357–61
 complications **360**
 ideal feeding tubes, pumps and
 devices **358**, 359
 psychological and social
 implications 359, 361
 training 357–9
 indications for EN 350–4
 cerebral palsy and neuro-
 developmental disorders
 351–2
 childhood malignancies 353
 congenital heart disease (CHD)
 353–4
 Crohn’s disease 351
 cystic fibrosis (CF) 352–3
 inadequate oral intake 350–1
 inherited metabolic disease 351
 malignancies 353
 oesophageal disease/injury 351
 primary disease management
 351
 short bowel syndrome 351
 swallowing dysfunction 351
 infant formulae 354
 amino acid-based 356
 malnutrition 349–50
 modular feeds 356
 nutrition requirements 1–12, **349**
 oral feeding, maintaining skills 361
 polymeric feeds 354–5
 children 1–6 years 355
 children over 6 years 355
 infants 0–12 months 354
 protein hydrolysate formulae
 355–6
 children 0–2 years 355
 children over 2 years 355–6
 see also home enteral tube feeding
 paediatric HIV infection 629–33
 paediatric jejunostomy 356–7
 paediatric nutrition assessment 221–2
 anthropometry 221–2
 cancer 642, 654
 clinical examination 221
 current perspectives 215–16
 dietary intake measurements 221
 laboratory 222

Cambridge University Press

978-1-107-60965-5 - Artificial Nutrition Support in Clinical Practice: Second Edition

Edited by Jason Payne-James, George K. Grimble and David B. A. Silk

Index

[More information](#)

INDEX

- paediatric nutrition requirements
213–24
carbohydrate 217
energy 216, 349
fat 217
fatty acids, long chain
polyunsaturated 221
fetal and neonatal malnutrition,
effects on adult health 220
fluids and energy **216**
height velocity and height attained
curves for boys and girls
215
historical background 215
infants, energy requirements 349
iron deficiency 220–1
mineral and trace elements 219
protein 217–19
protein intake 42
starvation effects in infants and
young children 219–21
vitamins 218–19
vulnerability of infants 349
water **216**, 217–18
paediatric parenteral nutrition **349**,
461–84
calcium and phosphate sources 473
carbohydrate sources 469
catheter complications 475–6
mechanical catheter problems
476
replacing surgical central venous
catheters 476
sepsis 475–6
cholestasis associated with PN
477–8
energy requirements 469
fat sources 472
fat emulsion and lung 473
formulation of feeds **465**, 468
commercially available products
466–7
nutrients, electrolytes, minerals
and vitamins **465**, 474
Fresenius Kabi nutrition
programme **470**
history 463
indications 464–7, **464**
metabolic complications **468**
monitoring 468–9, **468**
composition of abnormal fluid
losses **469**
nitrogen sources 469–72
outcome 478
particulate contamination of PN
solutions 478
PN formulation 441
prescription worksheet **471**
psychosocial development 478
special considerations 463–4
techniques for administering PN
474–7
central venous access 474–5
delivery 476–7
peripheral venous access 474
vitamins and trace elements 474
pamidronate, osteoporosis, HPN-
related 493
pancreatectomy
postoperative malabsorption 653
starch assimilation 118
pancreatic cancer
REE 644
specialised enteral diet 311
pancreatitis 719–32
acute
intracellular amino acids 30
post-pyloric enteral feeding
benefit 769
algorithm for nutritional
hyperalimentation **728**
chronic, dietary LCT and MCT
127
EN and PN 727–9
future trends 729–30
graded balance of nutritional
management **727**
history 721–2
pancreatic secretory stimulants **726**
level of GI tract **725**
theoretical concepts and benefits
722–7
villous height, effect of duration of
TPN therapy **723–4**
parathormone secretion
HPN, overnight feeding pattern
492
HPN bone disorders 492–3
parenteral nutrition
bacterial translocation 765
bag design
Big Bag system 437, 441
multichambered bag (MCG) 441
multilayered bags 440, 441
cancer 658–66
commercially available products
466–7
controversial areas 441–2
cost-effectiveness 743
elderly patients 693
EN vs PN 759–73
morbidity and mortality 767–9
non-outcome studies 763–4
equipment and facilities 441
aseptic facility 441–2
formulations 435–44
application practicalities 442
chemical stability and
compatibility 439–40
drug administration 440–1
historical background 437
monitoring 441
particulate contamination 478
precipitation
calcium phosphate 439–40,
441
monitoring 440
trace elements 440
stability of lipids 437–9
glutamine 159
HIV infection and AIDS 628–9
hospitalised patients 160
IBD 560–1
immune dysfunction 143
intradialytic, MHD patients 532
monitoring guidelines (BAPEN)
340–1
nutrition teams 396
pancreatitis 727–9
pre- and post-operative 156–8
surgical patients 610
see also parenteral nutrition, central
venous route (CPN); –
nutrition, metabolic
complications; – nutrition,
peripheral (PPN); – –
substrates; paediatric – –
parenteral nutrition, central venous
route (CPN) 382–8
access 474–5, 477
catheters 382–5
complications 386–8
indications/contraindications 382
tunnelling 385
parenteral nutrition, metabolic
complications 445–59
acute metabolic deficiencies 447–9
hypocalcaemia 448–9
hypoglycaemia 447–8
hypophosphataemia 448
amino acids 453–4
hypercalcaemia 453–4
biochemical monitoring **455**
chronic deficiency syndromes
449–50, **449**
essential fatty acid deficiency
(EFAD) 449
trace minerals 449–50
vitamins 450
zinc 449
definition **448**
diagnostic criteria 447
excessive glucose administration
450–2

INDEX

- parenteral nutrition, metabolic
 complications – *continued*
 excessive glucose administration –
 continued
 fluid retention 452
 hepatic steatosis 451–2
 hypercapnia 451
 hyperglycaemia 450–1
 hyperosmolar dehydration 451
 increased sympathetic activity 452
 inappropriate composition of
 nutrients 454–5
 hepatic dysfunction 454
 metabolic bone disease 454–5
 refeeding syndrome 455
 lipid emulsions 452–3
 nutrient deficiencies 447–50
 overfeeding of nutrients 450–4
 parenteral nutrition, peripheral (PPN)
 388–95
 access 160, 474
 administration methods 393–4
 catheters, care 395–6
 contraindications 389
 current practice 389
 evolution 388–9
 feeding duration 390
 limitations 389–90
 nutrient solution 395
 PVT risks 390–3
 recommendations 394–5
 regimen 389–90
 venous access, rotation and cyclical
 PPN infusion 393–5
 parenteral nutrition substrates 401–34
 carbohydrates 422–4
 historical development 403–5
 lipids 418–22
 proteins 405–18
 Parkland formula, fluid requirements 579
 Patients on Intravenous and Nasogastric Nutritional Therapy (PINNT), pumps and stands 489
 pectin supplements, predigested elemental diets 319
 pentane production, free radicals 100
 pentoxifylline, cancer therapy 649, 667
 pepsins, secretion 111
 peptides
 absorptive characteristics 115–17
 PepT1, feeding modes 117
 and neurotransmitters
 increasing food intake 233–4
 reducing food intake 235–6
 predigested elemental diets 318
 transport
 nitrogen assimilation 114–15
 PepT1 structural requirements 115
 percutaneous endoscopic
 duodenostomy (PED) 292
 removal 291
 percutaneous endoscopic gastrostomy (PEG) 160
 advantages/disadvantages 357, 371
 anatomy variations 291
 antibiotic prophylaxis 290
 complications 160, 290–1
 conversion to jejunostomies 281, 292
 Crohn's disease 290
 direct stab technique 288
 elderly patients 692–3
 complications 693
 feeding tube displacement 336–7
 long-term EN 288–91
 prophylactic antibiotics 693
 pull or push-through technique 288–9
 removal 291
 replacement 290–1
 Staphylococcus aureus colonisation 336
 percutaneous endoscopic jejunostomy (PEJ) 292
 removal 291
 percutaneous gastrostomy,
 fluoroscopically guided (FPG) 291
 peripheral vein thrombophlebitis (PVT) 390–3
 pathogenesis and aetiology 390
 predisposing factors and
 modification effects 391
 venous access rotation and cyclical
 PPN infusion 393–5
 venous trauma 393
 peritoneal dialysis, continuous ambulatory, PN 532
 pharmacist, team role 246
 pharmaconutrition 610–12
 see also arginine; fatty acids;
 glutamine
 pharyngeal flora 762
 pharyngostomy, cervical, longer-term EN 288
 phenylalanine–tyrosine tracer, protein turnover measurement 32
 phenylketonuria, tyrosine 408
 phlebitis, peripheral venous access 474
 phosphate
 age and RDA 219
 hypophosphataemia 341, 448, 530, 544
 monitoring, EN 296
 precipitation in formulations, PN 439–40, 441
 pyridoxal-5'-phosphate (PLP) 87
 sources, paediatric PN 473
 phospholipids, intravenous lipid emulsions 437
 5-phosphoribosyl-1-phosphate (PRPP), nucleotide salvage 125
 photodegradation of vitamins 440
 PICCs (peripherally inserted central catheters) 384–5
 pigeon, prolonged starvation,
 percentage loss of organs 5
 cis-platinum, side effects 652
 PN *see* parenteral nutrition
 pneumatosis intestinalis, EN 339
 pneumonia
 aspiration, intermittent enteral
 feeding 295
 aspiration risks, EN 338
 nosocomial, gut mucosal injury
 predictor 766
 pneumoperitoneum, PEG
 complication 290
 pneumothorax, CPN complication 386
 polymeric enteral diets 305–6,
 313–14
 fibre source 317
 hypotonic 313
 low osmolality 314
 paediatric EN 354–5
 polyribosome fraction, muscle protein
 synthesis 43
 portal vein, neutral lipid
 transportation 123
 postoperative nutrition 270–7
 cancer patients 275–6
 commercial drinks/liquid
 supplements 271
 elderly/geriatric patients 274–5
 post discharge from hospital 275
 vs preoperative 609–10
 preoperative feeding vs overnight
 fasting 274–5
 respiratory disease 275
 sip feeding, reduction in solid food
 consumption 276
 studies 276, 742
 surgical patients 156–8
 potassium
 deficiency 341

- jejunostomy 710
 monitoring, EN 296
 whole-body (WBK), TPN and EN 655–6
 PPN *see* parenteral nutrition, peripheral
 predigested chemically defined
 elemental diets 305–7, 311, 317–19
 fibre content 319
 lipid energy source 319
 nitrogen and carbohydrate source 318–19
 di/tripeptides 318
 maltodextrins 318
 sodium content 319
 trace elements and vitamins 319
 pregnancy, protein intake
 recommendations 42
 procarbazine, radiotherapy
 combination 653
 prognostic nutritional index (PNI) 173–4
 prokinetic drugs, FBT duodenal
 placement 287
 propranolol, diarrhoea association 338
 prostaglandins 473
 metabolism, PUFAs 545–6
 protease inhibitors, acute phase
 proteins 18–20
 proteases
 pancreatic, cascade 111
 protein hydrolysis 111
 protein(s)
 acute phase proteins 18–20
 assimilation 126
 absorption 110–12
 quantitative aspects 115–17
 dietary and endogenous, nitrogen
 assimilation 112
 fatty-acid binding protein (iFABP) 123
 hepatic disease 88–9
 hydrolysis 111, 116
 partial enzymic hydrolysates 318
 structure 111
 total body protein (TBP) 170
 transport protein identification,
 Kyte–Doolittle hydropathy
 plots 114–15
 transporter systems 112–15
 dibasic amino acids 114
 hydropathy identification 114–15
 protein assessment
 albumin and visceral proteins 169–70
 burns, predictions **583**
 in respiratory failure 546
 skeletal muscle 170–1
 critically ill patients in ICU **595**
 visceral proteins 169–70
 protein hydrolysates
 formulae, paediatric EN 355–6
 pulse-feeding 684
 short-chain 418
 protein metabolism 25–59
 activity and energy cost, burn
 injury **16**
 and alpha-2-macroglobulin 101–2
 analysis 29–31
 bacteraemia and increased
 mortality 103
 cancer cachexia 646
 tumour interference 647
 cytokines 101–2, 647–8
 sepsis, low and high REE, with
 i.v. glucose **74**
 dynamic nature 27
 energy and protein balances, TEE
 post severe head injury **17**
 hepatic, cancer cachexia 647
 kinetic response, TPN, cancer 656
 lean body mass determination,
 deuterium dilution 29
 muscle synthesis and breakdown,
 cancer cachexia 646–7
 nitrogen balance
 critically ill patients 260–1,
 597–8
 dietary energy and protein
 effects 44
 glutamine dipeptide TPN 411,
 416
 loss, lean tissue proteolysis 49
 measurement 17
 renal disease 525–6
 starvation, lean/obese subjects
 13
 total body (TBN), TPN and EN
 655–6
 trauma and sepsis 15–17,
 517–18, **518**
 urinary, monitoring, EN 296
 nitrogen excretion
 BUN and UNA 526, 529–30
 starvation
 fed state and post starvation 13
 ratio of cumulative N loss to
 weight loss **7, 8**
 short term **4**
 radioactive and stable-isotope
 tracers 29–30
 recommended intakes 42–3
 TNF-alpha effects 649–50
 tumour interference 638
 turnover/measurements 31–7, 69
 ageing effects 48–9
 amino acid free pool size 39
 amino acid intermediary
 metabolism 39–41
 arteriovenous (A–V) differences 32
 cancer 658
 catecholamines 48
 cellular biochemistry 43
 CO₂ 32
 compartmental and stochastic
 analysis 31–2
 cytokines 48
 defined 27
 dynamic methods 32–5
 eukaryotic initiation factors
 (eIFs) 43
 fed/fasted state responses 45
 glucagon 47
 growth hormone 47–8
 growth-related synthesis 43
 IGF-1 47–8
 index, tracer amino acids 33–4
 indicator amino acids 32–3
 injured/burned subjects **16, 72**
 insulin modification 46–7
 ¹³C-alpha-ketoisocaproate
 labelling 44–5
 mass isotope analysis 36
 muscle, disease and injury effects 49
 ¹⁵N-glycine ammonia 32
 nutrient and hormonal
 modification 46–9
 short term starvation 4
 testosterone 48
 thyroid hormone 47
 tracer amino acid incorporation 34–5
 whole body 170
 nutrient supply responses 44–5
 physiological control 43–6
 skeletal muscle 45–6
 protein mobilising factor (PMF),
 cancer cachexia 650–1
 protein nutrition substrates 405–9
 alternatives 409–18
 protein requirements
 amino acids **183**
 in disease 184–5
 elderly 684
 and energy intake 184
 healthy subjects 183–4
 hospital food 260–1
 in injury and sepsis 519
 oxygen consumption and RQ **68, 181**

Cambridge University Press

978-1-107-60965-5 - Artificial Nutrition Support in Clinical Practice: Second Edition

Edited by Jason Payne-James, George K. Grimble and David B. A. Silk

Index

[More information](#)

INDEX

- protein requirements – *continued*
 paediatric requirements 217–19, 355
 total kJ in storage 69
- protein synthesis 69
 coagulation system 85
 glutamine dipeptide TPN 411
 rate, intensive care **595**
 skeletal muscle 41–2, 43, 45
- protein–energy malnutrition *see* malnutrition
- proteolytic enzymes, protein catabolism 31
- proton pump inhibitors 711–12
- pseudomembranous colitis 338
- psoriasis, fish oil preparations 420
- psychosis, PEG contraindication 290
- psychosocial development, paediatric PN 478
- pulmonary aspiration *see* aspiration
- pulmonary immune response, malnutrition and refeeding 542–3
- pumps
 controlled feeding 337
 enteral tube feeding **358**, 359
 HPN 489
 portable EN pump **372**
 and stands 489
 volumetric 477
- PVT *see* peripheral vein thrombophlebitis
- pyridoxal-5'-phosphate (PLP), chronic hepatitis 87
- pyridoxine *see* vitamin B₆
- PYY, gastrointestinal effects 310–11
- quality of life
 HETF 375–6
 HPN 494
 and performance status, cancer, TPN 660
- radiation, taurine excretion 407
- radiation enteritis, PN 155
- radiotherapy
 and chemotherapy combination, cytotoxicity 653
 gastrointestinal tract tolerance 651–2
 head and neck 652
 nutrition complications 651
 TPN and EN 655, 660
- ranitidine 711
 PN formulation, multilayered bag 440–1
- rat
 prolonged starvation, percentage loss of organs **5**
 weight loss, acute phase proteins **19**
- recumbency *see* aspiration
- REE *see* resting energy expenditure
- refeeding syndrome 158
 effects on respiratory system 540–4
 PN 455
- reference nutrient intake (RNI) 199
- regurgitation, EN-related, incidence rates 337
- renal disease 523–35
 administration method 531–2
 amino acid metabolism 42
 background 525
 clinical management of nutrition therapy 528–30
 enteral diets 307
 experimental studies 528
 minerals, trace elements and vitamin requirements 530–1
 nitrogen balance 525–6
 serine 405
 tyrosine 408
- renal failure 321, 525
 intradialytic PN, MHD patients 532
 and MR 73
 nutrition management 526–8
 taurine concentrations 407
 tyrosine dipeptide TPN 416–17
- renal MR **66**
- respiratory disease/failure 537–52
 dehydration, elderly patients 689–90
 effects of malnutrition and refeeding 540–4
 altered microcirculation and interstitial lung water content 543
 cellular metabolism 543–4
 central ventilatory drive 540
 COPD 73, 319–20, 539, 541
 lung parenchyma 541–4
 pulmonary immune response 542–3
 respiratory muscle function 540–1
 structural changes 541–2
- enteral diets 319–20
- nutrition considerations 544–7
 administration route 547
 carbohydrates 545
 energy requirements 544–5
 hydration 547
 lipids 545–6
 micronutrients 546–7
 oral supplements 275
 pharmacology 547
- postoperative nutrition 272–5, 609–10
- proteins 546
- status 539–40
see also lungs
- respiratory distress syndrome, fish oil emulsions 421
- respiratory gas exchange, measurement of MR 63–4
- respiratory muscles, effects of malnutrition and refeeding 540–1
- respiratory quotient (RQ)
 cirrhosis, energy expenditure **504**
 lipogenesis and lipids 74
 major nutrients **68**
 oxygen consumption **68**
 refeeding 543
- resting energy expenditure (REE)
 after elective surgery **15**
 after injury **14**, 72
 after short term starvation **3–4**
 basal hypermetabolism **14**, 72–3
 direct effects of disease 181–3, 544–5
 ARF 528
 post absorptive state after fasting **182**
 sepsis, low and high REE, i.v. glucose **74**
- estimates **180**
- Harris & Benedict equations 179, 260, 308
- indirect effects of disease 181–2
 fever and ambient temperature 181–2
 injury and sepsis 515
 loss of lean body mass 181
 respiratory failure 544
 low and high REE, with IV glucose **74**
 short term starvation **3–4**
- resuscitation, Ringers lactate 579
- retinol binding protein, as marker of nutrition 170
- rheumatoid arthritis
 cytokines 97
 fish oil preparations 420
- riboflavin *see* vitamin B₂
- rickets, paradox, HPN 492
- RNA, protein metabolism
 measurement 31
- RNA intake, immune function 139
- rough endoplasmic reticulum (RER), protein synthesis 85
- saccharidases, brush-border
 disaccharidases, TPN 761

- satiety, defined 227
- scurvy, ascorbic acid deficiency 156
- secretagogue release, enteral diets 311
- selenium
- age and RDA 219
 - deficiency 100, 140, 449–50, 546
 - AIDS 625, 631
 - HPN, cardiomyopathy association 490
 - IBD 559
 - myopathy and cardiomyopathy association 156
 - supplements 474
 - RDA/effects 204–5, 546
- sepsis
- catheter-related 386–7
 - catheter care 384
 - diagnosis 387
 - intracellular amino acids 30
 - see also* injury and sepsis
 - serine, protein nutrition substrate 405
- serotonin, food intake, appetite control 235
- short bowel/syndrome 701–18
- anatomical and physiological considerations 703–5
 - GI motility 704
 - jejunal, ileal and colonic absorption 704–5
 - small intestinal length 703–4
 - sodium:glucose **704**
 - types 705–6
 - volume of GI secretions 704
- causes 706
- diarrhoea 708–9
- electrolyte and fluid losses 319
- enteral diets 311
- future treatments 714
- conjugated bile acid treatment 714
 - dietary or drug therapy to improve absorption 714
 - mucosal growth factors 714
- gallstones 707
- glucose uptake 120–1
- history 703
- indications for EN, paediatric 351
- intestinal size
- adaptation, post-surgery 110
 - metabolic body mass relationship 109–10
- PN 155
- preserved colon 707–9
- carbohydrates 708
 - fat 708
 - nutrient absorption 707–8
 - oxalate 708
- presentation 707
- water and mineral losses 708
- problems and treatments 706–7, **706**
- protein–energy malnutrition 706
 - social problems 707
 - steatorrhoea 319
 - surgery 713–14
 - transplantation 714
 - vitamin B₁₂ deficiency 707
 - see also* jejunostomy
- short-chain peptides
- synthetic 409, 416–17
 - see also* glutamine, glutamine dipeptides; tyrosine, tyrosine dipeptides
- sip-feeds, elderly patients 692, 694
- skeletal muscle
- amino acid metabolism 42
 - ketone bodies 71
 - loss
 - ageing 683
 - protein supplementation 684
- MR 66**
- protein assessment 170–1
 - protein synthesis 41–3, 45
 - protein turnover effects 45–6
- small bowel
- amino acid metabolism 42
 - anastomosis, oral feeding 273
 - radiotherapy effects 653
 - resection, dietary LCT and MCT 127
- small bowel transplantation 714
- smoking
- acute phase proteins 101
 - and antioxidants, in cytokines 99–101
 - catheter-related sepsis risks 489
 - and macrophages 100–1
- sodium
- hyper/hyponatraemia 341
 - predigested elemental diets 319
- sorbitol, risks 423
- spirometry 63
- splanchnic bed
- blood exchange, amino acids 32
- MR 66**
- Staphylococcus aureus*
- catheter-related sepsis 386
 - PEG association 336
- starch, oxygen consumption and RQ **68**
- starvation, prolonged 4–13
- BMR, and fuel selection **10**
 - body composition, fuel availability and survival time **6**
 - clinical aspects 69–71
 - energy expenditure, urinary N excretion **70**
 - glucose and plasma FFA, obese subjects **71**
 - increase in energy expenditure **70**
 - metabolism/metabolic rate 69–71
 - intermediary metabolism 9–13
 - ketone bodies (3-hydroxybutyrate (beta-OHB) and acetoacetate (AcAc) adults and children **11**
 - blood glucose and non-esterified fatty acids **13**
 - circulating concentration **12**
 - molar ratio **11**
 - obese subjects **71**
- N excretion **8**
- fed state and post starvation 13
 - ratio of cumulative N loss to weight loss **7**
- obesity, effect on survival time, mice/humans **5, 8**
- percentage loss of organs, various species 5
- protein deprivation 316
- protein oxidation, BMR, effect of BMI **9**
- total available energy derived from fat, carbohydrate and protein **6**
- starvation, short-term 3–4
- clinical aspects 69–71
 - effects in infants and young children 219–21
 - energy metabolism 3–4
 - changes in REE **3–4**
 - gastrointestinal motility 309
 - glutamine provision 127
 - metabolic response 154
 - nitrogen excretion decrease 44
 - peptide absorption 115–16, 126
 - protein metabolism 4
 - protein synthesis depression 45
- steatohepatitis, HPN related 491
- steatorrhoea *see* liver disease
- steroids
- anabolic
 - cancer therapy 666
 - protein turnover effects 48
- stoma
- gastrostomy button **358**
 - short bowel anastomosed to colon **707**
- streptozotocin, side effects 652
- subcutaneous tube (SCJ), jejunostomy 293

Cambridge University Press

978-1-107-60965-5 - Artificial Nutrition Support in Clinical Practice: Second Edition

Edited by Jason Payne-James, George K. Grimble and David B. A. Silk

Index

[More information](#)

INDEX

- substrate utilisation, injury and sepsis 515–17
 sucrose, classification 118
 sucrose, EN 120–2
 support team roles 241–53, 396
 Calman modular training 251
 composition of Oldchurch team **247**
 finance 251
 general hospital audit 248–50
 history of nutrition support 243
 multidisciplinary approach 244
 optimal nutrition 160
 primary/secondary care interface 250
 relationship to non-team clinicians 244–5
 safer IV feeding 243–4
 subsequent developments 250–1
 team members 245–7
 surgical patients 605–16
 correction of nutrition depletion 608–9
 population at risk 609
 EN vs PN 610
 enteral feeding contraindication 296
 future trends 611–12
 gastric atony 309
 history 607
 malnourishment 154
 morbidity increase 156
 pharmakonutrition 610–12
 arginine 611
 glutamine 610–11
 n-3 fatty acids 611
 polymeric enteral diets 313–14
 practical applications 609–12
 pre- and postoperative nutrition support
 EN vs PN 768
 PN 156–8
 preoperative vs postoperative nutrition 272–5, 609–10
 surgical risk 608
 theoretical benefits of nutrition support 607–9
 see also hospital patients;
 postoperative nutrition;
 specific surgical procedures
 surgical procedures
 abdominal, enteral tube feeding 159
 gastrointestinal, enteral feeding contraindication 296
 intestinal, oral regimen/supplements **273**
 postabdominal, diet regurgitation and aspiration risks 286
 postoperative intracellular amino acids 30
 postoperative risk factors 608
 preoperative vs postoperative nutrition 272–5, 609–10
 swallowing disorders 286, 309
 enteral tube feeding 159–60
 indications for paediatric EN 351
 tachyphylaxis, TNF-alpha administration 648
 taurine 477
 conjugate hydrolysis 407
 intracellular 38
 protein nutrition substrate 406–7
 taurine-enriched HPN 491
 testosterone, protein turnover effects 48
 thermoregulation, malnutrition association 156
 thiamin *see* vitamin B₁
 thioguanine, malabsorption 653
 thrombophlebitis, particulates 478
 thrombosis
 catheter material 383
 central vein (CVT), catheter-related sepsis 490
 CPN 387
 postoperative, fish oil emulsion 421
 see also peripheral vein
 thrombophlebitis (PVT)
 thromboxane, and leukotrienes **564**
 thymic atrophy, protein energy malnutrition 155–6
 thyroid hormones
 MR 67
 protein turnover effects 47
 thyroxine, carbohydrate homeostasis 83
 thyroid-binding prealbumin, monitoring, EN 296
 thyrotropin-releasing hormone 236
 tissue biopsy, body composition determination 29
 tissue wasting
 accelerated 155
 arm circumference measurement 151–2
 total available energy (TEE)
 elderly patients 684
 estimates of metabolism/metabolic rate **180**
 post severe head injury, energy and protein balances **17**
 prolonged starvation, fat, carbohydrate and protein **6**
 weight loss, HIV infection and AIDS **623**
 total parenteral nutrition
 historical landmarks 382
 see also parenteral nutrition
 trace elements 193–212, **204–7**
 assessment and monitoring of status 199–207
 cellular metabolism **197**
 effects of disease 198
 elderly requirements 686–7
 EN, monitoring and replacement 340
 enteral and parenteral differentiation 198–9, 208
 functions 197–8
 HPN 490
 metabolism and biochemistry 207–8
 oral dietary supplements 313
 PN formulation, extended shelf lives 442
 PN mixture precipitation 440
 predigested elemental diets 319
 recommended intakes 199–207
 biological dose–response curves **199**
 inadequate, progressive effect **195**
 large intake effects 196–7
 suboptimal intake effects 195–6
 reference nutrient intake (RNI) 199
 requirements
 paediatric 219, 474
 renal disease 530–1
 respiratory failure 546–7
 short bowel 705
 ultra-trace elements 208
 see also *named minerals*
 tracheal intubation, feeding tube malposition 335
 tracheostomy
 aspiration risks, EN 338
 PEG placement 290
 transferrin
 monitoring, EN 296
 visceral protein marker 170
 transgastric jejunal tube 358
 transnasal nasoenteral tubes 285–6
 transporter systems
 monosaccharide 119–20, 120
 proteins 112–15
 triacylglycerol, storage costs 69
 triceps skinfold thickness (TSF) 169, 173
 triglyceride–fatty acid metabolism
 activity and energy cost, burn injury **16**
 critical illness 74

- during starvation 9–10
- triglycerides 448
- emulsion (STG) 452
- hepatitis 86–7
- hydrolysis, colipase micellar binding 122
- hypertriglyceridaemia, lipid emulsions in PN 453
- long-chain (LCT) 122, 452, 456
- medium-chain (MCT) 122–3, 403, 419–20, 452, 456
- LCT combination 420
- rate of administration 420
- synthesis 84
- trophamine 472
- trypsin, zymogen activation 111
- tryptophan, encephalopathy association 89
- tube feeding syndrome 340
- tumour cells
 - growth retardation, arginine 405–6
 - proliferation, TPN 661–3
 - stomal seeding, PEG complications 290
- tumour necrosis factor- α
 - cancer cachexia 648–9
 - capillary leak in injury and sepsis 514
 - fat metabolism 649
 - glucose metabolism 649
 - inhibitors 97–8, 648–9
 - lipolysis stimulation 649
 - nitrogen metabolism 649
 - role 95
 - and weight loss 101
 - see also* cytokines
- tyrosine 408
 - acetyltirosine, renal clearance 417–18
 - tyrosine dipeptides 408, 416–17
- ulceration, feeding tubes 336
- ulcerative colitis 555–66
 - fish oil preparations 420
 - nutritional management 563–4
- ultrasonography, FBT placement 287
- undernutrition, inpatients
 - actual consumption 257–9
 - immune dysfunction 142
 - recommendations 263–4, 277
 - see also* malnutrition
- uraemia
 - hepatic encephalopathy 89
 - histidine 405
 - intracellular amino acids 30
 - muscle fatigue, taurine depletion association 406–7
- urea
 - nitrogen assimilation 112
 - synthesis
 - amino acid metabolism 84
 - hepatic disease 88
 - inhibition, xylitol 423–4
- urea nitrogen appearance (UNA) 526, 529–30
- ureagenesis, amino acid regulatory role 39
- urinary catheterisation, laparoscopic gastrostomy 291–2
- urinary infections, dehydration, elderly patients 689–90
- ursodeoxycholic acid, intrahepatic cholestasis 491–2
- Van der Waal's forces, lipid emulsion destabilisation 437–8
- vanadium
 - excess 141
 - PTH secretion suppression 493
- ventilated patients, diet regurgitation and aspiration risks 286
- ventilatory drive
 - effects of malnutrition and refeeding 540
 - malnutrition in respiratory disease/failure 540
- villous height, TPN in pancreatitis **723–4**
- vinca alkaloids
 - chemotherapy combination 653
 - malabsorption 653
 - mucositis 652
- viruses, and cytokines 96
- visceral proteins *see* albumin; transferrin
- vitamin A
 - age and RDA 218
 - Crohn's 558
 - hypervitaminosis A 686
 - immune function 141
 - and mother-to-child transmission of HIV **626**
 - photodegradation 440
 - RDA/effects 200–1
 - renal failure 531
- vitamin B₁
 - deficiency
 - alcohol misuse 109
 - Wernicke's encephalopathy 156, 686
 - degradation, bisulphite 440
- vitamin B₁ and B₂
 - age and RDA 218
 - deficiency 450
 - ICU **196**
- immune function 141
- RDA/effects 200–1
- vitamin B₆
 - deficiency, and immune function 141
 - RDA/effects 202–3
 - renal failure 531
- vitamin B₁₂
 - deficiency 707
 - ageing 109
 - macrocytic megaloblastic anaemia 156
 - RDA/effects 202–3
- vitamin C
 - age and RDA 218
 - degradation, PN formulation 440
 - immune function 141
 - RDA/effects 202–3
 - scurvy 156
- vitamin D
 - age and RDA 218
 - D-induced osteomalacia, HPN 492
 - deficiency 558
 - PBC 87
 - RDA/effects 200–1
 - renal failure 531
- vitamin E
 - age and RDA 218
 - deficiency 100, 558
 - immune function 141
 - photodegradation 440
 - RDA/effects 200–1
- vitamin K
 - deficiency
 - bone metabolism 493
 - prothrombin time 87–8, 89
 - RDA/effects 200–1
 - renal failure 531
- vitamins 193–212, **200–3**
 - assessment and monitoring of status 199–207
 - in cellular metabolism **197**
 - deficiencies **195**
 - causes and effects 686
 - hepatic disease 87–8
 - in IBD 558–9
 - and immune function 141
 - PN 450
 - see also specified substances*
 - degradation, PN formulation 440
 - effects of disease 198
 - elderly requirements 685–6
 - enteral and parenteral differentiation 198–9, 208
 - fat-soluble, cirrhosis 86
 - functions 197–8
 - hepatic metabolism 85
 - HPN 490

INDEX

vitamins – <i>continued</i> inadequate intake, progressive effect 195 metabolism and biochemistry 207–8 monitoring and replacement, EN 340 neurocognitive disorder relationship 685 oral dietary supplements 313 paediatric requirements 218–19, 474 PN formulation, extended shelf lives 442 predigested elemental diets 319 recommended intakes 199–207 biological dose–response curves 199 inadequate, progressive effect 195 large intake effects 196–7 renal disease 530–1 suboptimal intake effects 195–6 respiratory failure 546–7 short bowel 705	water and fat-soluble, immune function 141 volunteers, help with hospital feeding 262 vomiting EN-related, incidence rates 337 feeding tube malposition 337 ward staffing 262 warfarin, HPN 387 water doubly-labelled water method, measurement of MR 64 and electrolyte absorption 123–4 extracellular water volume (ECW) albumin as marker 173 assessment 171 malabsorption and diarrhoea 124–5 paediatric requirements 217–18 requirements, elderly patients 689–90 weight gain/loss <i>see</i> appetite; body weight; obesity Wernicke’s encephalopathy alcoholic cirrhosis 87	thiamine deficiency 156 vitamin B ₁ , 686 WHO cholera solution 711 <i>Xenopus laevis</i> oocyte, transporter proteins 113–14 xylitol, liver metabolism 423–4 zinc acute phase response 206 age and RDA 219 and casein 219 and cytokines 97 deficiency acrodermatitis 140 HIV infection 625, 631 IBD 559 incidence rates 341 PN 449 and immune function 140 RDA/effects 204–5 RNI and RDA 199 supplements 474 TNF-alpha inhibitors 97–8, 648–9
--	---	---