

# Contents

	<i>List of contributors</i>	xi
	<i>Foreword</i> William H. Dietz	xv
	<i>Preface</i>	xix
<b>Part I</b>	<b>Causes</b>	<b>1</b>
1	Measurement and definition	3
	Tim J. Cole and Marie Françoise Rolland-Cachera	
	1.1 Introduction	3
	1.2 Natural history of adiposity	4
	1.3 Measurement of body fat	4
	1.4 Adiposity as proxy for later adiposity, morbidity and mortality	14
	1.5 Definition of childhood obesity	15
	1.6 Conclusions	22
	1.7 References	22
2	Epidemiology	28
	Michèle Guillaume and Inge Lissau	
	2.1 Introduction	28
	2.2 Epidemiology and methods	28
	2.3 The scale of the problem	34
	2.4 Conclusions	44
	2.5 References	45
3	Molecular and biological factors with emphasis on adipose tissue development	50
	Martin Wabitsch	
	3.1 Introduction	50
	3.2 Regulation of body weight	51
	3.3 Single gene defects	52
	3.4 Regulation of body energy stores at adipose tissue level	55
	3.5 Changes of body fat stores during development	55

3.6	Changes at cellular level related to changes in body fat	57
3.7	Lipid storage in adipose tissue (lipogenesis)	58
3.8	Lipid mobilization (lipolysis)	59
3.9	Preadipocytes in human adipose tissue	60
3.10	Proliferation and differentiation of preadipocytes	60
3.11	Adipogenic activity of human serum	60
3.12	Hormonal and nutritional factors regulating adipose differentiation	62
3.13	Human adipocytes are secretory cells	65
3.14	Conclusions	66
3.15	References	66

## 4 Nutrition 69

Marie Françoise Rolland-Cachera and France Bellisle

4.1	Introduction	69
4.2	Secular trends of nutrition and obesity	69
4.3	Relationship between nutrition and adiposity	74
4.4	Qualitative assessment of intake behaviour	79
4.5	Lifestyle	83
4.6	Conclusions	85
4.7	References	86

## 5 Physical Activity 93

Yves Schutz and Claudio Maffeis

5.1	Introduction	93
5.2	Energy expenditure assessment	93
5.3	Energy intake vs. energy expenditure	94
5.4	Components of total energy expenditure	95
5.5	Excess energy intake vs. low energy expenditure	98
5.6	Aerobic capacity ( $VO_{2\max}$ ) in obesity	101
5.7	Substrate oxidation and substrate balance	102
5.8	Conclusions	104
5.9	References	105

## 6 Psychosocial factors 109

Andrew J. Hill and Inge Lissau

6.1	Children's social background	109
6.2	Attitudes to obesity	111
6.3	Children's self-worth	115
6.4	Parents and peers	118
6.5	Conclusions	122
6.6	References	123

<b>Part II</b>	<b>Consequences</b>	129
7	Clinical features, adverse effects and outcome	131
	Karl F.M. Zwiauer, Margherita Caroli, Ewa Malecka-Tendera and Elizabeth M.E. Poskitt	
	7.1 Clinical findings and immediate adverse effects	131
	7.2 Intermediate medical consequences	142
	7.3 Long-term consequences	145
	7.4 References	147
8	The obese adolescent	154
	Marie-Laure Frelut and Carl-Erik Flodmark	
	8.1 Biophysical factors	154
	8.2 Psychological aspects	160
	8.3 References	166
9	Prader–Willi and other syndromes	171
	Giuseppe Chiumello and Elizabeth M.E. Poskitt	
	9.1 Introduction	171
	9.2 Endocrine problems	171
	9.3 Prader–Willi syndrome (PWS)	174
	9.4 Other obesity syndromes	180
	9.5 References	184
10	Hormonal and metabolic changes	189
	Ewa Malecka-Tendera and Dénes Molnár	
	10.1 Pituitary–adrenal axis	190
	10.2 Pituitary–gonadal axis	192
	10.3 Pituitary–thyroid axis	194
	10.4 Growth hormone and insulin-like growth factors	195
	10.5 Hyperinsulinaemia and insulin resistance	198
	10.6 Leptin	203
	10.7 References	209
11	Risk of cardiovascular complications	221
	David S. Freedman, Sathanur R. Srinivasan and Gerald S. Berenson	
	11.1 Introduction	221
	11.2 Secular trends	223
	11.3 Associations with risk factors	224
	11.4 Body fat patterning	230
	11.5 Longitudinal analyses	234
	11.6 Conclusions	235
	11.7 References	235

<b>Part III</b>	<b>Prevention and management</b>	241
12	Prevention	243
	Inge Lissau, Walter Burniat, Elizabeth M.E. Poskitt and Tim J. Cole	
	12.1 Prevention before management	243
	12.2 Why prevention?	243
	12.3 Prevention strategy	245
	12.4 Responsibilities for prevention	248
	12.5 Reduce sedentary activity	252
	12.6 Reduce poor dietary habits	257
	12.7 Prevention programmes	263
	12.8 Monitoring and evaluation	264
	12.9 Conclusions	264
	12.10 References	265
13	Home-based management	270
	Elizabeth M.E. Poskitt	
	13.1 Introduction	270
	13.2 Principles of modifying lifestyles to encourage slimming in obese children	273
	13.3 What can be recommended?	275
	13.4 Eating and diet	277
	13.5 Conclusions	280
	13.6 References	280
14	Dietary management	282
	Margherita Caroli and Walter Burniat	
	14.1 Introduction	282
	14.2 History of dietary therapy	282
	14.3 Aims of dietary treatment	283
	14.4 Types of diet	284
	14.5 Consequences of dieting	290
	14.6 Guidelines for weight goals and dietetic treatments	299
	14.7 Conclusions	301
	14.8 References	302
15	Management through activity	307
	Jana Parizkova, Claudio Maffei and Elizabeth M.E. Poskitt	
	15.1 Introduction	307
	15.2 Aims of the programmes	308
	15.3 Efficacy of exercise in lowering fat mass	310
	15.4 General principles	313

	15.5 Physical activity and exercise programmes	314
	15.6 How to improve compliance	320
	15.7 The role of the family	321
	15.8 Conclusions	322
	15.9 References	323
16	<b>Psychotherapy</b>	327
	Carl-Erik Flodmark and Inge Lissau	
	16.1 Obesity – a disease put into perspective	327
	16.2 The treatment of obesity	328
	16.3 Conclusions	340
	16.4 References	341
17	<b>Drug therapy</b>	345
	Dénes Molnár and Ewa Malecka-Tendera	
	17.1 Appetite suppressants	345
	17.2 Thermogenic agents	348
	17.3 Digestive inhibitors	349
	17.4 Hormone analogues and antagonists	350
	17.5 References	352
18	<b>Surgical treatment</b>	355
	Alessandro Salvatori	
	18.1 Introduction	355
	18.2 Surgical techniques and their complications	355
	18.3 Bariatric surgery in adolescence	357
	18.4 Conclusions	358
	18.5 References	358
19	<b>Interdisciplinary outpatient management</b>	361
	Beatrice Bauer and Claudio Maffei	
	19.1. Goal and general philosophy	361
	19.2 Multifaceted treatment programmes	364
	19.3 Organizing team work	370
	19.4 Acknowledgements	374
	19.5 References	374
20	<b>Interdisciplinary residential management</b>	377
	Marie-Laure Frelut	
	20.1 Historical background and implementation	377
	20.2 A comprehensive approach	378
	20.3 Results and outcome	385

	20.4 Conclusions	386
	20.5 References	386
21	<b>The future</b>	<b>389</b>
	W. Philip T. James	
	21.1 Introduction	389
	21.2 Assessment of childhood obesity	389
	21.3 Ethnic differences in children's anthropometry	391
	21.4 The Thrifty Genotype	393
	21.5 The prevalence of childhood obesity	394
	21.6 Weaning practices and early eating habits	395
	21.7 The 'obesogenic' environment	396
	21.8 Can policy initiatives work?	397
	21.9 Devising and implementing new policies	399
	21.10 References	401
	<i>Index</i>	403