

Contents

Contributors	xxvii
Foreword	xxxiii
Preface	xxxv
About the Companion Website	xxxvii
Characteristics and Care Needs	xxxix
<i>Ahmed H. Abdelhafiz, Ann Middleton and Alan J. Sinclair</i>	
Introduction	xxxix
Characteristics	xli
Care Needs	xlili
Physical Function	xlili
Mental Function	xlili
Care Delivery	xlvi
Family Support	xlvi
Care Organisation	xlvii
Continuity of Care	xlvii
Care Homes	xlviii
Conclusion	xl ix
Clinical Practice Question	xl ix
References	xl ix
1 Epidemiology and Pathophysiology	1
<i>Sarah L. Sy</i>	
Introduction	1
Epidemiology	2
Pathophysiology of Diabetes in Older Adults	3
Age-related Alterations in Glucose Metabolism	3

Genetics.....	5
Lifestyle and Environmental Factors.....	5
Other Factors	6
What Are the Key Issues?.....	6
Prevention of Diabetes in Older Adults	6
Hypoglycaemia.....	7
Management	7
Summary	7
Clinical Practice Question.....	9
References	9
2 Screening and Diagnosis.....	11
<i>Isabelle Bourdel-Marchasson</i>	
Introduction.....	11
Background	12
Key Issues.....	14
Screening.....	14
Diagnosis.....	16
Clinical Practice Questions.....	17
References	18
3 Lifestyle Interventions.....	21
<i>Abdiazizi Yusuf and Ahmed H. Abdelhafiz</i>	
Introduction.....	21
Impact of Lifestyle Changes	22
Lifestyle Intervention	23
Nutrition	24
Exercise	25
Synergy Between Nutrition and Exercise.....	27
Care Homes	27
Summary	28

Clinical Practice Question.	28
References	29
4 Oral Hypoglycaemic Therapy	31
<i>Nahian Kazi and Ahmed H. Abdelhafiz</i>	
Introduction	31
Hypoglycaemic Agents	32
Low Hypoglycaemia-Risk Agents	32
Metformin	32
Dipeptidyl Peptidase-4 Inhibitors	34
Sodium Glucose Transporter-2 Inhibitors	34
Glucagon-like Peptide-1 Receptor Agonists.	35
Thiazolidinediones	35
Alpha-glucosidase Inhibitors	36
High Hypoglycaemia Risk Agents	36
Sulfonylureas	36
Meglitinides.	37
Therapeutic Approach	37
Summary	38
Future Perspectives.	39
Clinical Practice Question.	39
References	40
5 Insulin Therapy.	41
<i>Giuseppe Maltese</i>	
Introduction	41
Basal Insulin Analogues.	42
Rapid-acting Analogues	44
Treatment Regimens	45
Summary	47
Clinical Practice Question.	47
References	47

6	Use of Continuous Glucose Monitoring in Older People with Diabetes	49
	<i>Giuseppe Maltese</i>	
	Introduction	50
	Continuous Glucose Monitoring	50
	Patient Assessment	52
	Challenges	54
	Clinical Practice Question	54
	References	55
7	Education: Key Features for Achieving Success	57
	<i>Kirsty Winkley and Angus Forbes</i>	
	Introduction	57
	Key Issues	58
	Diabetes Complications	59
	Other Comorbidities Not Specific to Diabetes	60
	Polypharmacy	60
	Anti-diabetes Oral and Injectable Agents	60
	Hypoglycaemia	62
	Risk of Falls and Fractures	63
	Cognitive Impairment	63
	Nutrition	64
	Management	64
	Determine Frailty Risk	64
	Deprescribing and Optimisation	65
	Glucose Monitoring and Insulin Delivery Technologies	66
	Physical Exercise	66
	Healthy Diet	67
	Diabetes Self-management Education for Older People	67
	Clinical Practice Question	68
	References	68

8 Carers and Care Needs71

Puja Merwaha and Ahmed H. Abdelhafiz

Introduction	71
Care Needs	72
Carer Groups	73
Role of Carers	73
Benefit of Care on Outcomes	74
Caring for Carers	74
Carers' Burden	75
Supporting Carers	75
Summary	76
Clinical Practice Question	78
References	78

9a Macrovascular Complications: Peripheral Arterial Disease.....81

*Leocadio Rodríguez-Mañas, Rubí E. Sandoval-Santoyo
and Marta Castro-Rodríguez*

Epidemiology	81
Risk Factors	81
Prevalence	82
Pathogenesis	82
Consequences of Peripheral Arterial Disease	83
Investigations	83
Anamnesis	83
Physical Examination	84
Non-invasive Tests	84
Invasive Tests	85
Management	85
Risk Factor Modification	85
Exercise Rehabilitation	85
Foot Care	86

Pharmacological Therapy	86
Antiplatelet Therapy	86
Cilostazol	86
Revascularisation	86
Clinical Practice Question	86
References	87

9b Macrovascular Complications: Coronary Arterial Disease 89

Leocadio Rodríguez-Mañas, Rubí E., Sandoval-Santoyo and Marta Castro Rodríguez

Epidemiology	89
Pathogenesis	90
Medical Treatment	90
Indications for Revascularisation	91
Management of Cardiovascular Risk Factors According to Baseline Functional and Cognitive Status	92
Effect of Glycaemic Control on Cardiovascular Events	92
Effect of Blood Pressure Control	92
Lipid Monitoring	93
Physical Exercise and Diet	93
Frailty Management	93
Management	93
Summary	95
Clinical Practice Question	95
References	96

9c Macrovascular Complications: Cerebrovascular Disease 97

Abubakhr Subkhan, Arshad Majid and Ali Ali

Introduction	97
Epidemiology	98
Risk Factors	98

Aetiology and Pathophysiology	99
Presentation	99
Stroke and Transient Ischaemic Attack.	101
Cerebral Small Vessel Disease and Dementia	101
Management of Cerebrovascular Disease	102
Acute Stroke	102
Management of Risk Factors	104
Prognosis	105
Summary	106
Clinical Practice Question.	106
References	107

10a Microvascular Complications: Diabetic Eye Disease 109

Archith Kamath and Nachiketa Acharya

Introduction	110
Epidemiology	110
Presentation.	110
Pathophysiology	111
Management	113
Primary Care	113
Secondary Care.	115
Summary	117
Clinical Practice Questions.	117
References	118

10b Microvascular Complications: Diabetic Kidney Disease. 119

Mohsen El Kossi

Introduction	119
Diabetic Kidney Disease.	120
Definitions and Diagnoses.	120
Management	121

Lifestyle	121
Glycaemic Control	122
Blood Pressure Control	122
Lipid Control	123
Diabetic Kidney Disease-related Complications	124
Anaemia	124
Mineral Bone Disorder	124
Metabolic Acidosis and Fluid Retention	125
Nephrology Referral	125
Summary	126
Clinical Practice Question	127
References	127

10c Microvascular Complications: Peripheral Neuropathy... 129

Mitra Tavakoli

Introduction	130
Prevalence and Risk Factors	130
Clinical Manifestations and Complications	131
Diagnosis and Assessment	132
Management of Diabetic Neuropathy	135
Diabetes Foot Care in Care Homes	136
Summary	138
Clinical Practice Question	138
References	139

11a Vascular Risk Factors: Hypertension 141

Pann Ei Hnyynn Si and Ahmed H. Abdelhafiz

Introduction	141
Age-related Blood Pressure Changes	142
Definition	142
Diagnosis	144

Types 144

Management 145

 Recommended Targets 145

 Medications 146

 Considerations in Older People 147

 Orthostatic Hypotension 147

 Falls 148

 Systolic Hypertension 148

 Frailty 148

 Dementia 149

 Comorbidity 149

 Polypharmacy 149

Summary 149

Clinical Practice Question 151

References 151

11b Vascular Risk Factors: Dyslipidaemia 153

Pann Ei Hnyynn, Si and Ahmed H. Abdelhafiz

Introduction 153

Ageing and Lipid Profile 154

Diabetes and Lipid Profile 154

Diabetes and Risk of Atherosclerotic Cardiovascular Disease 155

Atherosclerotic Cardiovascular Disease Risk Reduction 156

Lipid-lowering Agents 157

Goals of Therapy in Old Age 160

Recommendations from Guidelines 160

Goals in Frailty 162

Summary 162

Clinical Practice Question 162

References 164

12a Metabolic Decompensation: Hyperglycaemic Crisis 165

Puja Merwaha and Ahmed H. Abdelhafiz

Introduction	165
Epidemiology	166
Precipitating Factors	166
Pathogenesis	168
Clinical Presentation	168
Diagnosis	169
Management	171
Correction of Hypovolaemia	172
Correction of Hyperglycaemia	173
Correction of Acidosis	174
Correction of Electrolytes	175
Complications	175
Prevention	176
Clinical Practice Question	176
References	177

12b Metabolic Decompensation: Hypoglycaemia 178

Srikanth Bellary, Ahmed H. Abdelhafiz and Alan J. Sinclair

Introduction	179
Definition	179
Recognition	179
Epidemiology	180
Pathophysiology	180
Clinical Consequences	181
Impact on Cognition	182
Impact on Frailty	182
Management	183
Summary	185
Clinical Practice Question	185
References	186

13a Management of Diabetes in Hospital189

Julie Lewis and Chris Cottrell

Introduction	189
Fundamentals of Care	190
Key Considerations for Effective Inpatient Care for Older People with Diabetes.....	192
The Inpatient Setting.....	192
Pressure Damage and Footcare Assessment	193
Planning Care	193
Key Considerations to Reduce Unscheduled Admission to Hospital	193
Monitoring Requirements	196
Education and Training	196
Summary	197
Clinical Practice Questions.....	198
References	199

13b Management of Diabetes in Care Homes201

Lynne Reedman and Alan J. Sinclair

Introduction	201
Important Considerations for Diabetes Care	203
Importance of Monitoring Glucose Levels	207
Other Management Issues	207
Hypoglycaemia	208
Diabetes Foot Disease	209
Nutritional Deficiency and Weight Loss.....	209
Frailty.....	210
Education	210
Communication and Collaboration	211
Use of Audit	211
Measuring Outcomes	212
Summary	212

Clinical Practice Question. 213
 References 214

14 Nutrition215

Rihan Said and Grace Zaman

Introduction 215
 Nutritional Deficiencies 216
 Causes of Malnutrition in the Elderly 216
 Recommendations 217
 Specific Recommendations for Older People
 with Diabetes. 218
 Practical Steps for Nutritional Care in the Elderly 218
 Screening. 218
 Assessment 219
 Intervention 219
 Enteral Nutrition 221
 Types of Enteral Tubes 221
 Types of Feeds 221
 Enteral Feed Delivery Options. 221
 Management of Blood Glucose 221
 Parenteral Nutrition 222
 Management of Blood Glucose 223
 General Considerations for Patients on Nutritional
 Support. 224
 Summary 224
 Clinical Practice Questions. 225
 References 226

15 Sexual Health229

Pann Ei Hnyynn Si and Ahmed H. Abdelhafiz

Introduction 229
 Ageing and Sexual Function 230
 Diabetes and Sexual Dysfunction 230

Sexual Dysfunction in Men	231
Aetiology and Pathogenesis.....	231
Diagnosis.....	232
Treatment	233
Sexual Dysfunction in Women	236
Aetiology and Pathogenesis.....	236
Diagnosis.....	237
Treatment	237
Summary	238
Clinical Practice Questions.....	238
References	239
16a Special Issues in Old Age: Frailty	241
<i>Alan J. Sinclair and Ahmed H. Abdelhafiz</i>	
Introduction.....	241
Frailty–diabetes Inter-relationship	242
Effect of Diabetes on Frailty.....	244
Effects of Frailty on Diabetes.....	245
Outcome Effects.....	249
Metabolic Effects	249
Sarcopenic Obese Phenotype.....	254
Anorexic Malnourished Phenotype	254
Prevention and Management	255
Screening.....	255
Non-pharmacological Therapy.....	256
Pharmacological Therapy.....	257
Special Considerations	259
Glycaemic Control	259
Choice of Hypoglycaemic Agent	260
Sarcopenic Obese Phenotype.....	260
Anorexic Malnourished Phenotype	260
Goals of Therapy	261
Summary	262

Future Perspectives. 262
Clinical Practice Question. 263
References 264

16b Special Issues in Old Age: Multimorbidity266

Alan J. Sinclair and Ahmed H. Abdelhafiz

Introduction. 266
Multimorbidity 267
Multimorbidity–Frailty Interaction 268
Multimorbidity Effects on Diabetes 268
Clusters of Multimorbidity 269
Clinical Implications 270
Summary 272
Future Perspectives. 272
Clinical Practice Question. 273
References 273

16c Special Issues in Old Age: Type 1 Diabetes Mellitus275

Alex M. Summerbell and Ahmed H. Abdelhafiz

Introduction. 275
Epidemiology and Diagnosis. 276
Management 276
 Insulin Therapy. 278
 Monitoring 279
 Reducing Hypoglycaemia 280
 Goals of Therapy 282
Summary 282
Clinical Practice Question. 282
References 283

16d Special Issues in Old Age: Cognitive Health Agility, Cognitive Dysfunction, Dementia and Diabetes285

Tali Cukierman-Yaffe

Introduction	286
Population Studies Demonstrating the Relationship Between Cognitive Dysfunction, Dementia and Diabetes	286
Implications of the Relationship Between Diabetes and Cognitive Dysfunction	287
The Effect of Cognitive Dysfunction on Self-care Capacity in Older People with Diabetes	288
Assessment of Cognitive Health Agility in Older People with Diabetes	290
Prevention and Treatment of Cognitive Dysfunction in Older People with Diabetes	291
The Effect of Current Diabetes Pharmacological Agents on Cognitive Dysfunction	291
Glucose Control	292
Insulin	293
Dipeptidyl Peptidase-4 Inhibitors	294
Glucagon-like Peptide-1 Receptor Analogs	294
The Multidomain Approach	295
Summary, Knowledge Gaps and Future Research	296
Clinical Practice Question	296
References	298

16e Special Issues in Old Age: Depression299

Sara-Louise Wylie

Introduction	299
Depression and Diabetes	300
Presentation	300

Evaluation.....	302
Screening.....	302
Diagnosis.....	303
Assessment.....	304
Management.....	307
Lifestyle.....	307
Pharmacological Therapy.....	308
Psychotherapy.....	309
Collaborative Care.....	310
Summary.....	310
Clinical Practice Question.....	310
References.....	311

16f Special Issues in Old Age: Foot Care313

Solomon Muzulu

Introduction.....	313
Epidemiology.....	314
Pathogenesis.....	314
Ageing and Diabetic Foot Ulcer Disease.....	315
Assessment of a Diabetic Foot.....	316
Testing for Peripheral Sensory Neuropathy.....	316
10-g Monofilament Test.....	317
128-Hz Tuning Fork.....	318
Ipswich Touch Test.....	318
Checking for Peripheral Vascular Disease.....	318
Management.....	318
Offloading.....	320
Debridement.....	320
Dressings.....	320
Infection Control.....	320
Ischaemia Relief.....	321
Glycaemic Control.....	322

Prevention	322
Summary	323
Clinical Practice Question.....	323
References	324

16g Special Issues in Old Age: Skin Care326

Grace Keegan and Sarah Mahmoud

Introduction.....	326
Age-related Skin Changes	327
Diabetes Mellitus-related Skin Conditions	327
Primary Skin Conditions	328
Acanthosis Nigricans	328
Necrobiosis Lipoidica	328
Diabetic Dermopathy.....	329
Bullous Eruption of Diabetes Mellitus.....	329
Diabetes-related Skin Infections	330
Bacterial Infections.....	330
Fungal Infections	331
Diabetes Medications-related Skin Adverse Effects	334
Insulin.....	334
Sodium Glucose Transporter-2 Inhibitors.....	334
Summary	334
Clinical Practice Question.....	335
References	335

16h Special Issues in Old Age: Falls and Bone Health336

Nandkishor V. Athavale

Introduction.....	336
Epidemiology.....	337
Pathophysiology of Fracture Risk in Diabetes	337
Pathophysiology and Risk Factors for Falls in Diabetes	338
Assessment of the Risk of Falls in the Community	339

Assessment of Bone Health in Community 340
Management and Prevention 344
 Falls 344
 Fractures 345
Summary 345
Clinical Practice Question 345
References 346

16i Special Issues in Old Age: Avoiding Hospitalisation347

Demelza Emmerton and Ahmed H. Abdelhafiz

Introduction 347
Risk Factors for Hospitalisation 348
Avoiding Hospitalisation 349
Patient-Related Interventions 349
 Physical Function 349
 Mental Function 351
 Polypharmacy 351
Healthcare System-related Interventions 352
 Community Setting 352
 Care-home Setting 353
 Emergency Setting 353
Summary 355
Clinical Practice Question 355
References 356

16j Special Issues in Old Age: Use of Technology357

Anna Kahkoska, Aastha Dubal, Josh Weinstein and Ruth S. Weinstock

Introduction 358
 What Is Diabetes Technology? 358
 What Is Remote Patient Monitoring? 359
 Diabetes Technology and Remote Patient Monitoring
 in Older Adults 360
Management 362

Continuous Glucose Monitoring	362
What Is Continuous Glucose Monitoring?	362
What Is the Evidence for Continuous Glucose Monitoring as Part of Management for Older Adults with Diabetes?	362
What Are Challenges for Continuous Glucose Monitoring Use in Older Adults?	363
Automated Insulin Delivery Systems	363
What Is Automated Insulin Delivery?	363
Evidence on Automated Insulin Delivery for Older Adults	364
Clinical Guidelines for Automated Insulin Delivery Usage among Older Adults with Type 1 Diabetes	364
What Are Challenges for Automated Insulin Delivery Use in Older Adults?	364
Integration of Diabetes Technologies with Remote Patient Monitoring	365
What Are the Key Issues?	366
Clinical Practice Questions	368
References	369
16k Special Issues in Old Age: Annual Reviews	371
<i>Puja Merwaha and Ahmed H. Abdelhafiz</i>	
Introduction	371
Diabetes Phenotype in Older People	372
Multimorbidity	372
Geriatric Syndromes	373
Frailty	373
Functional Implications	373
Annual Review Contents	374
Demographics	374
History	374
Physical Examination	374
Vascular Complications	376
Sexual Function	376

Cognition and Mood	376
Physical Function and Frailty	377
Foot Care	377
Diet and Nutrition	377
Medication Review	377
Infection Prevention	378
Summary	378
Clinical Practice Question	378
References	380

16l Special Issues in Old Age: Mouth Care381

Nali Ahmed and Ahmed H. Abdelhafiz

Introduction	381
Age-related Oral Changes	382
Diabetes-related Oral Changes	382
Common Oral Conditions in Older People with Diabetes	384
Periodontal Disease	384
Dental Caries	384
Dry Mouth	385
Candida	386
Oral Cancer	386
Taste Impairment	387
Mouth Care	387
Education	387
Glycaemic Control	388
Preventative Measures	388
Summary	389
Clinical Practice Question	390
References	390

16m Special Issues in Old Age: Pain Management392

Pann Ei Hnyyn Si and Ahmed H. Abdelhafiz

Introduction	392
Aetiology	393

Assessment	393
Pain in Care-home Residents	396
Management	397
Non-pharmacological Therapy	397
Pharmacological Therapy	398
Prevention	401
Clinical Practice Question	401
References	402

17 Deintensification of Therapy405

Antoine Christiaens

Introduction	405
Key Issues	407
Management	407
Identifying Patients Who Might Benefit	407
Deintensifying Glucose-lowering Treatment in Older Patients	409
Implementing Deintensification in Daily Clinical Practice	410
Clinical Practice Questions	411
References	412

18 Diabetes in End-of-Life Care413

June James

Introduction	413
Background	414
What is End of Life and How is the Need for End-of-life Care Identified?	414
Management of Diabetes in End-of-Life Care	419
Medicines Management and De-escalation of Therapies	419
Steroids and Cancer	422
Nutrition and Enteral Feeding	424
Advanced Care Planning	424
Treatment Withdrawal	424

Workforce Training and Competencies	424
Summary	425
Clinical Practice Questions	425
References	426
Answers to Clinical Practice Questions	429
Index	445