

Table of Contents

Welcome!	1-5
Course Overview	1-7
Chapter Two: Anatomy and Physiology	1-7
Chapter Three: Definition, Epidemiology, Classification and Diagnosis	1-7
Chapter Four: Pathophysiology	1-8
Chapter Five: Complications	1-8
Chapter Six: Essentials of Management	1-9
Chapter Seven: Emerging Therapies	1-9
Learning Tools	1-11
Pre- and Post-tests	1-11
Glossaries	1-11
Patient Profiles	1-11
Figures and Tables	1-12
Section Summaries	1-12
Further Reading	1-12

Table of Contents

Learning Objectives	2-5
Pre-test	2-7
Pre-test Answer Key	2-9
Chapter Overview	2-11
SECTION ONE: The Digestive System	2-13
Structure and Components	2-14
Function	2-15
Nutrients	2-16
Macronutrients	2-16
Micronutrients	2-25
Section Summary	2-26
SECTION TWO: The Endocrine System	2-27
Structure and Function	2-28
Components	2-29
Pituitary	2-30
Adrenal Glands	2-31
Pancreas	2-32
Insulin	2-34
Insulin Binding and Signalling	2-35
Metabolic Effects of Insulin	2-36
Glucagon	2-36
Incretins and the Incretin Effect	2-37
Section Summary	2-38
SECTION THREE: The Cardiovascular System	2-41
Structure and Function	2-42
Components	2-43
Heart	2-43
Blood	2-43
Blood Vessels	2-44
Circulation	2-45
High Blood Pressure (Hypertension)	2-46
Section Summary	2-47

Table of Contents (continued)

SECTION FOUR: The Renal System	2-49
Structure and Function	2-50
Anatomy of the Kidney	2-51
The Nephron	2-52
The Kidney in Action	2-53
The Renin-Angiotensin-Aldosterone System	2-54
Section Summary	2-55
Post-test	2-57
Post-test Answer Key	2-61
Further Reading	2-64
Chapter Glossary	2-65

Table of Contents

Learning Objectives	3-5
Pre-test	3-7
Pre-test Answer Key	3-9
Chapter Overview	3-11
SECTION ONE: What Is Metabolic Syndrome?	3-13
Definition	3-14
Insulin Resistance	3-14
The Essential Components of Metabolic Syndrome	3-14
The Debate over Metabolic Syndrome	3-16
Section Summary	3-18
SECTION TWO: What Is Diabetes?	3-19
Definition	3-20
Diagnosis	3-20
Classifications	3-21
Type 1 Diabetes	3-21
Type 2 Diabetes	3-22
Gestational Diabetes Mellitus	3-22
Other Specific Types	3-23
Risk Factors for Diabetes	3-24
Prediabetes	3-24
Insulin Resistance	3-25
Acanthosis Nigricans	3-25
Skin Tags	3-25
Hyperandrogenism	3-26
Extreme Insulin Resistance Syndromes	3-26
Age	3-26
Family History of Type 2 Diabetes	3-26
History of Gestational Diabetes	3-26
Polycystic Ovary Syndrome	3-27
Schizophrenia	3-27
Other Risk Factors	3-27
Diabetes Incidence, Impact and Cost	3-28
Diabetes Worldwide	3-28
Diabetes in Canada	3-29

Table of Contents (continued)

Diabetes Signs and Symptoms	3-31
Excessive Urination (Polyuria)	3-31
Weight Loss	3-31
Excessive Thirst (Polydipsia)	3-31
Excessive Hunger (Polyphagia)	3-31
Infections and Poor Wound Healing	3-31
Blurred Vision	3-31
Hypoglycemia	3-32
Section Summary	3-33
Meet the Patient	3-34
Patient Profile: Janis	3-34
Post-test	3-39
Post-test Answer Key	3-41
Further Reading	3-43
Chapter Glossary	3-45

Table of Contents

Learning Objectives	4-5
Pre-test	4-7
Pre-test Answer Key	4-9
Chapter Overview	4-11
SECTION ONE: The Relationship between Diabetes and Metabolic Syndrome	4-13
Metabolic Syndrome and the Domino Effect	4-14
The Common Factor	4-15
Section Summary	4-16
Meet the Patients	4-17
Patient Profile 1: Jonathon	4-17
Patient Profile 2: Kylie	4-18
SECTION TWO: The Mechanism of Insulin Resistance	4-19
Normal Insulin Signalling	4-20
Insulin-Resistant Signalling	4-21
Insulin Resistance and Obesity	4-22
Section Summary	4-24
Jonathon's Profile Continues	4-25
Kylie's Profile Continues	4-27
SECTION THREE: The Mechanism of Type 2 Diabetes	4-29
Pathogenesis	4-30
Section Summary	4-31
SECTION FOUR: The Mechanism of Type 1 Diabetes	4-33
Pathogenesis	4-34
Section Summary	4-36
Jonathon's Profile Continues	4-37
Comparison of Type 2 and Type 1 Diabetes	4-38
Post-test	4-39
Post-test Answer Key	4-41
Further Reading	4-43
Chapter Glossary	4-45

Table of Contents

Learning Objectives	5-5
Pre-test	5-7
Pre-test Answer Key	5-9
Chapter Overview	5-11
Meet the Patients	5-13
Patient Profile 1: Raj	5-13
Patient Profile 2: Stephanie	5-14
SECTION ONE: Neuropathy, a Microvascular Complication	5-15
Diabetic Neuropathy	5-16
Mechanisms of Diabetic Neuropathy	5-16
Common Types of Diabetic Neuropathy and Their Associated Signs and Symptoms	5-20
Screening and Diagnosis	5-25
Prevention and Delay	5-26
Management	5-26
Section Summary	5-29
SECTION TWO: Nephropathy, a Microvascular Complication	5-31
Diabetic Nephropathy	5-32
Signs and Symptoms	5-32
Progression	5-32
Screening	5-34
Prevention and Delay	5-35
Management of Microalbuminuria and Proteinuria	5-35
Raj's Profile Continues	5-36
Section Summary	5-37
SECTION THREE: Retinopathy, a Microvascular Complication	5-39
Diabetic Retinopathy	5-40
Mechanisms Leading to Diabetic Retinopathy	5-42
Progression	5-42
Signs and Symptoms	5-44
Screening	5-44
Management and Treatment	5-45
Raj's Profile Continues	5-47
Section Summary	5-48

Table of Contents (continued)

SECTION FOUR: Macrovascular Complications	5-51
Types of Macrovascular Complications	5-52
Cardiovascular Disease	5-54
Stephanie's Profile Continues	5-55
Cerebrovascular Disease	5-56
Peripheral Vascular Disease	5-58
Stephanie's Profile Continues	5-60
Section Summary	5-61
Post-test	5-63
Post-test Answer Key	5-65
Further Reading	5-67
Chapter Glossary	5-69

Table of Contents

Learning Objectives	6-7
Pre-test	6-9
Pre-test Answer Key	6-11
Chapter Overview	6-13
Meet the Patients	6-14
Patient Profile 1: Carol	6-14
Patient Profile 2: Hari	6-15
Carol's Profile Continues	6-16
Hari's Profile Continues	6-17
The Diabetes Management Team	6-18
SECTION ONE: Lifestyle Changes	6-19
Diet and Weight Control	6-20
Macronutrients	6-21
Carbohydrates	6-21
Glycemic Index	6-22
Dietary Fibre	6-22
Sugars	6-23
Fat	6-23
Trans Fatty Acids	6-23
Protein	6-24
Weight Control	6-25
Physical Activity	6-26
Aerobic Exercise	6-26
Resistance Training	6-26
Benefits of Lifestyle Changes: Clinical Trials	6-27
The Diabetes Prevention Trial	6-27
Carol's Profile Continues	6-29
Hari's Profile Continues	6-29
Section Summary	6-30
SECTION TWO: Goals of Therapy	6-31
Goals of Therapy	6-32
New Targets for Glycemic Control	6-33
Section Summary	6-34

Table of Contents (continued)

SECTION THREE: Benefits of Intensive Glycemic Control	6-35
Landmark Trials and Intensive Glycemic Control	6-36
Type 2 Diabetes: The UKPDS Trial	6-36
Background: The Trial	6-36
Post-trial Monitoring	6-37
Type 1 Diabetes: The DCCT	6-38
Background: The Trial	6-38
Post-trial Monitoring: The EDIC Study	6-39
Metabolic Memory, the Legacy Effect and the Importance of Early, Aggressive Treatment	6-40
Section Summary	6-41
SECTION FOUR: Glycemic Monitoring	6-43
Why Is Monitoring Important?	6-44
Physician Monitoring: Laboratory Testing	6-44
Glycated Hemoglobin (A1C)	6-44
Patient Self-monitoring	6-44
Section Summary	6-47
SECTION FIVE: Pharmacological Agents for Glycemic Control	6-49
Introduction to Antihyperglycemic Agents	6-50
Non-insulin Therapies	6-50
Insulin Sensitizers	6-50
Incretin Analogues	6-52
DPP-4 Inhibitors	6-52
Alpha-glucosidase Inhibitors	6-53
Insulin Secretagogues	6-53
Initial Therapy	6-54
Combination Therapy	6-54
Insulin Therapies	6-57
Classification of Insulin	6-58
Insulin Regimens	6-64
Adjusting Insulin Dose	6-64
Role of Insulin in Type 2 Diabetes	6-65
Hypoglycemia	6-65
Section Summary	6-66

Table of Contents (continued)

SECTION SIX: Benefits of Blood Pressure Control	6-69
Hypertension, Diabetes and Diagnosis	6-70
Treating to Target	6-70
Monitoring Blood Pressure	6-71
Physician Monitoring	6-71
Self-monitoring	6-71
Pharmacotherapy for Hypertension	6-71
Section Summary	6-73
SECTION SEVEN: Benefits of Lipid Control	6-75
Cardiovascular Disease Risk and Diabetes	6-76
Benefits of Treating LDL-C	6-76
Lipid Monitoring	6-77
Treatment of Dyslipidemia	6-78
Focus of Treatment: LDL-C	6-78
Treating to Target	6-78
Pharmacological Agents for Dyslipidemia	6-79
Beyond Statins: Adjuvant Pharmacotherapy	6-84
Patients Not Meeting Their LDL-C Target	6-84
Carol's Profile Continues	6-84
Hari's Profile Continues	6-85
Section Summary	6-86
Management Checklist	6-87
Post-test	6-89
Post-test Answer Key	6-91
Further Reading	6-93
Chapter Glossary	6-98
Appendix 1: Examples of Commonly Prescribed Antihypertensive Agents	6-101
Appendix 2: Examples of Lipid-Lowering Therapies	6-102

Table of Contents

Learning Objectives	7-5
Pre-test	7-7
Pre-test Answer Key	7-9
Chapter Overview	7-11
Obesity and Diabetes	7-13
SECTION ONE: Medical Advances	7-15
Phases of Clinical Trials	7-16
Obesity Therapies	7-16
Orlistat	7-17
Cetilistat	7-18
Lorcaserin	7-18
Tesofensine	7-19
Phentermine-topiramate	7-20
Naltrexone-bupropion	7-21
Conclusion	7-21
Sodium-Glucose Cotransporter 2 Inhibitors	7-22
Dapagliflozin	7-23
Canagliflozin	7-24
Conclusion	7-24
Cholesteryl Ester Transfer Protein Inhibitors	7-25
Anacetrapib	7-27
Evacetrapib	7-28
Conclusion	7-28
Section Summary	7-29
SECTION TWO: Surgical Advances	7-31
Bariatric Surgery	7-32
Common Bariatric Procedures	7-32
Treatment with Bariatric Surgery	7-36
Risks and Complications of Bariatric Surgery	7-37
Conclusion	7-38
Pancreas and Islet Transplantation	7-38
Pancreas Transplantation	7-39
Islet Transplantation	7-40
Conclusion	7-40
Section Summary	7-41

Table of Contents (continued)

SECTION THREE: Technological Advances	7-43
Insulin Pumps	7-44
Continuous Glucose Monitoring	7-45
Artificial Pancreas Project	7-46
Conclusion	7-46
Section Summary	7-47
Post-test	7-49
Post-test Answer Key	7-51
Further Reading	7-53
Chapter Glossary	7-56