
Contents

1 Preface: A New Disease?	1
Joel Rodriguez-Saldana	
Part I Magnitude of the Problem from an Individual and Social Context	
2 The Dynamics of Diabetes Prevalence, Morbidity, and Mortality	15
Dani de Paula, Paula Bracco, and Edward W. Gregg	
3 The Economic Costs of Diabetes	25
Joel Rodriguez-Saldana	
4 The Ecological Approach to Self-Management in Diabetes	49
Edwin B. Fisher, Paul Bloch, and William Sherlaw	
5 Social Determinants of Health and Diabetes Outcomes	77
Hideki Hashimoto	
Part II Diagnosis, Classification and Mechanisms of Disease	
6 Definition, Diagnostic Criteria, Screening, Diagnosis, and Classification of Diabetes and Categories of Glucose Intolerance: An Update	89
Lakshmana Perumal Nandhini, Sadish Kumar Kamalanathan, and Jayaprakash Sahoo	
7 Homeostasis of Glucose and Intermediate Metabolism: From the Lens of a Clinician	105
Nitin Kapoor and Madhukar Mittal	
8 Pathophysiology of Type 1 Diabetes	115
Rita Gomez-Diaz	
9 Pathophysiology of Type 2 Diabetes	127
Jothydev Kesavadev, Fatema Jawad, Asma Deeb, Ankia Coetzee, M.A. Jalil Ansari, Dina Shrestha, Noel Somasundaram, and Sanjay Kalra	
10 Genetic Determinants of Type 2 Diabetes	143
Miguel Cruz, Adán Valladares Salgado, Eugenia Flores Alfaro, José de Jesús Peralta Romero, and Joel Rodriguez-Saldana	
11 Gene Expression Modifications in Type 2 Diabetes	153
Fernando Suárez-Sánchez and Jaime Gómez-Zamudio	
12 The Immune System and Inflammation in Type 2 Diabetes	171
Rebeca García-Macedo and María de los Angeles Fortis	
13 Dysfunction and Death of Pancreatic Beta-Cells in Type 2 Diabetes	197
Clara Ortega Camarillo	

14	Obesity in the Pathophysiology of Diabetes	217
	Juan Antonio Paniagua and Antonio Vidal-Puig	
15	Pathogenesis of Gestational Diabetes Mellitus	247
	Evangelia Kintiraki, Gesthimani Mintziori, and Dimitrios G. Goulis	
16	Nonalcoholic Fatty Liver in the Pathogenesis of Diabetes	261
	Cristiane A. Villela Nogueira and Nathalie Carvalho Leite	
Part III Examples of Global Experiences in Diabetes Care		
17	Diabetes Management in Asia	273
	Kavita Singh, Roopa Shivashankar, Mareesha Gandral, L.R. Aravind, and Nikhil Tandon	
18	Diabetes Management in Latin America	285
	Rodrigo M. Carrillo-Larco, Paula A. Bracco, Antonio Bernabe-Ortiz, Maria Lazo-Porras, Jessica H. Zafra-Tanaka, Janeth Tenorio-Mucha, Omar Yaxmehen Bello-Chavolla, and David Beran	
19	Diabetes Management in the United States	309
	Megha K. Shah, Farah Naz Khan, and Mohammed K. Ali	
20	Diabetes Management in Africa	329
	Simeon Pierre Choukem, Christian Akem Dimala, Camille Mba, and Jean Claude Mbanya	
Part IV Basic Components of Management: Patient Centeredness, Evidence-Based Medicine and Outcomes—Challenges for Implementation		
21	The Patient-Centered Medical Home, Primary Care, and Diabetes	349
	Joel Rodriguez-Saldana	
22	Outpatient Diabetes Management and the Chronic Care Model	365
	Joel Rodriguez-Saldana	
23	Clinical Practice Guidelines, Evidence-Based Medicine and Diabetes	391
	Joel Rodriguez-Saldana	
24	Measuring Diabetes Quality of Care: Clinical Outcomes, Cost-Effectiveness, and Patient Experience of Care	411
	Patrick J. O'Connor, Katherine Diaz Vickery, and Todd P. Gilmer	
25	Challenges to Diabetes Care Innovation. The Case of a Major Public Institution in Mexico	421
	Miguel Ángel González Block, Sandra Patricia Díaz Portillo, Hortensia Reyes Morales, Joel Rodriguez-Saldana, Emilio Gutiérrez Calderón, Carlos Chivardi, Lucero Cahuana-Hurtado, José Moreno, Emily Vargas Riaño, Nelly Salgado, and Blanca Estela Pelcastre-Villafuerte	
26	Clinical Inertia and Diabetes Outcomes	435
	Joel Rodriguez-Saldana	
27	Patient Adherence: Challenges, Myths, and Realities	451
	Joel Rodriguez-Saldana	
Part V Resources of Support for Persons with Diabetes		
28	Challenges and Opportunities in Diabetes Education	471
	Jane K. Dickinson, Melinda Downie Maryniuk, and Margaret A. Powers	

29	Diabetes and Mental Health: From Distress to Depression	487
	Gerhard Heinze-Martin, Diana Patricia Guizar, and Napoleon Andrés Bernard	
30	Continuous Glucose Monitoring in Clinical Practice: Ambulatory Glucose Profile and the Application of Advanced Glucose Sensing Technologies to Clinical Decision-Making	499
	Roger S. Mazze and Joel Rodriguez-Saldana	
31	Healthy Lifestyles for the Self-Management of Type 2 Diabetes	513
	Karla I. Galaviz and Mohammed K. Ali	
32	Evidence and Implementation of Medical Nutrition Therapy in Persons with Diabetes	527
	Alison Evert, Melinda D. Maryniuk, and Jo-Anne Rizzotto	
33	Evidence and Implementation of Physical Activity and Exercise in Diabetes Mellitus	535
	Edna Jáuregui-Ulloa, Juan López-Taylor, Raúl Soria-Rodríguez, and Ruth García-Camarena	
Part VI Drug Therapy		
34	The “Old” Oral Antidiabetics	551
	Ingrid Mühlhauser, Susanne Buhse, and Joel Rodriguez-Saldana	
35	Incretin Therapies: Current Use and Emerging Possibilities	565
	Haiko Schlögl and Michael Stumvoll	
36	Sodium-Glucose Cotransporter 2 Inhibitors	581
	George Dailey III and Joel Rodriguez-Saldana	
37	Use of Insulin in Outpatient Diabetes Management	593
	Raquel N. Faradji, Elena Sainz de la Maza, Ana Paula Díaz Barriga Menchaca, and Juan Ramón Madrigal Sanromán	
38	Insulin Pump Therapy	607
	Raquel N. Faradji, Elena Sainz de la Maza, and Juan Ramón Madrigal Sanromán	
Part VII Cardiovascular Risk Factors		
39	Diabetes and Hypertension	627
	Hasan Syed, Sowjanya Naha, Dharshan Khangura, Michael Gardner, L. Romyne Kurukulasuriya, and James R. Sowers	
40	Diabetes and Atherogenic Dyslipidemia	645
	Arshag D. Mooradian	
41	Obesity and Diabetes: Clinical Aspects	657
	Sean Wharton, Rebecca A. G. Christensen, Christy Costanian, Talia Gershon, and Joel Rodriguez-Saldana	
42	Metabolic and Bariatric Surgery in Diabetes Management	673
	Luis Zurita Macías Valadez, María E. Frigolet, Raúl Marín Dominguez, Radu Pescarus, Carlos Zerrweck, Vanessa Boudreau, Aristithes Doumouras, Tyler Cookson, and Mehran Anvari	
43	Diabetes and Smoking: The Burden of Evidence	691
	Sameer Aggarwal, Deepak Khandelwal, Deep Dutta, Sanjay Kalra, and Yatan Pal Singh Balhara	

Part VIII Acute Complications

- 44 Hyperglycemic Crises: Diabetic Ketoacidosis** 699
Bobak Moazzami, Zohyra E. Zabala, and Guillermo E. Umpierrez
- 45 Hypoglycemia: Diagnosis, Management, and Prevention** 711
Raquel N. Faradji, Ana C. Uribe-Wiechers, and Elena Sainz de la Maza
- 46 Inpatient Management of Diabetes and Hyperglycemia** 739
William B. Horton
- 47 Diabetes and Infection** 755
Atulya Atreja, Sanjay Kalra, and Joel Rodriguez-Saldana
- 48 COVID-19, Diabetes, and Cardiovascular Disease** 787
Marco A. Peña Duque, Arturo Abundes Velasco, José Carlos Núñez Gómez, Enid Andrea Islas Navarro, and Eduardo Armando Aguilar Torres

Part IX Chronic Complications

- 49 Biochemical Mechanisms of Vascular Complications in Diabetes** 795
Margarita Díaz Flores, Mariadel Carmen Cortés Ginez, and Luis Arturo Baiza Gutman
- 50 Diabetes and Cardiovascular Disease** 813
Daniel Coutiño-Castelán, Arturo Abundes-Velasco, Félix Damas de los Santos, Eduardo A. Arias Sánchez, Celso Mendoza González, Arturo Méndez Ortiz, José L. Morales, José Luis Briseño de la Cruz, César Eduardo Hernández Fonseca, Piero Custodio Sánchez, and Joel Rodriguez-Saldana
- 51 Diabetes and Stroke: The Role of Glucose Regulation** 837
Forrest Lowe, Wuwei Feng, and Carlos Cantú-Brito
- 52 Peripheral Arterial Disease and Diabetes Mellitus** 857
Georges M. Haidar and Boulos Toursarkissian
- 53 Ophthalmic Disease in Diabetes** 877
José Henriques, Sara Vaz-Pereira, João Nascimento, Marco Medeiros, Susana Henriques, and Paulo Caldeira Rosa
- 54 Diabetes and Oral Health** 891
Rosa María Díaz-Romero and Manuel Salvador Robles-Andrade
- 55 Renal Disease in Diabetes** 905
Carlos A. Garza-García, Virgilia Soto-Abraham, and Magdalena Madero-Rovalo
- 56 Peripheral Diabetic Neuropathies** 923
Gergely Feher
- 57 Diabetic Cardiac Autonomic Neuropathy** 939
Victoria Serhiyenko and Alexandr Serhiyenko
- 58 Autonomic Visceral Neuropathy and Gastrointestinal Disorders** 967
Anne Mohr Drewes, Christina Brock, and Asbjørn Mohr Drewes
- 59 Urologic Complications in Patients with Diabetes** 979
Ivan Mauricio Schroeder-Ugalde, Karen Yhadira Sanchez-Lastra, and Angel Enrique Garcia-Cortes

60	Musculoskeletal Complications of Diabetes Mellitus	993
	Deep Dutta, Rajiv Singla, Meha Sharma, Aarti Sharma, and Sanjay Kalra	
61	Diabetes and the Skin	1003
	Justine Mestdagh, Sterre Blanche Laura Koster, Jeffrey Damman, and Hok Bing Thio	
62	Foot Complications	1021
	Lawrence B. Harkless, Jarrod Shapiro, and Joel Rodriguez-Saldana	
63	Diabetes and Cancer	1041
	Joanna Wojciechowska, Wojciech Krajewski, Tomasz Zatoński, and Joel Rodriguez-Saldana	
Part X Diabetes in Special Populations		
64	Diabetes in Children and Adolescents	1063
	América Liliana Miranda Lora, Montserrat Espinosa Espíndola, Martha Beauregard Paz, Jorge Mario Molina Díaz, and Miguel Klünder Klünder	
65	Pregnancy: Pre gestational and Gestational Management	1095
	María Isabel García Argueta, Maricela González Espejel, and Joel Rodriguez-Saldana	
66	The Elderly with Diabetes	1105
	Willy Marcos Valencia	
Part XI Novel Therapeutic Approaches: Evidence-Based and Others		
67	The Artificial Pancreas	1119
	Barry H. Ginsberg, Richard Mauseth, and Joel Rodriguez-Saldana	
68	Unproven Therapies for Diabetes	1125
	Jothydev Kesavadev, Anjana Basanth, and Sanjay Kalra	
69	Insulin Delivery: An Evolution in the Technology	1141
	Jothydev Kesavadev, Gopika Krishnan, and Nelena Benny	
	Index	1159